

# ExpoTees 2016

Showcasing the next generation of digital expertise

School of Computing

# Welcome

to ExpoTees 2016



I am delighted that ExpoTees 2016 is our 11th annual exhibition of students' work from Teesside University's School of Computing. Once again we are proud to showcase some truly excellent work with a wide selection of projects from our final-year students. Project topic areas this year range from advanced software engineering and programming to computer games, music, media and computer animations.

ExpoTees is scheduled to run over two days, with computer science and digital media subjects on day one, and games and animation on day two. We also include some of the research work undertaken by our postgraduate computing students. I am sure that you will agree that this brochure is evidence of the outstanding world-leading work that our students produce – an exemplar to universities worldwide.

It is a great credit to our students, and the staff who have taught, enthused and supported them during their studies, that our graduates enter employment with many world-leading organisations. I hope that you enjoy your time at our exhibition. Do use it as an opportunity to meet our students, and find out more about their wonderful achievements.

*Simon Stobart*

**Dr Simon Stobart**  
Dean, School of Computing

## Friends of ExpoTees

ExpoTees has grown in size and reputation over the last 11 years, with many visitors returning year on year. We are delighted to welcome our event partners Accenture, Ampliance and Sky Betting & Gaming.

We are very proud of our growing community of supporters, and we'd like you to join our LinkedIn ExpoTees group where you can meet academics, exhibitors past and present, and all the supporters who have worked to make ExpoTees such a success over the past decade.

**accenture**  
High performance. Delivered.



**sky** BETTING & GAMING



# Contents

## Animation & Visual Effects 11

- BA (Hons) Computer Animation and Visual Effects 13
- BA (Hons) Computer Animation and Visual Effects (with Foundation Year) 18
- BA (Hons) Computer Character Animation 19

## Games 27

- BA (Hons) Computer Games Animation 29
- BA (Hons) Computer Games Animation (with Foundation Year) 32
- BA (Hons) Computer Games Art 33
- BA (Hons) Computer Games Art (with Foundation Year) 40
- BA (Hons) Computer Games Design 41
- BSc (Hons) Computer Games Programming 44

## Digital Media & Web 51

- BA (Hons) Web and Multimedia 53

## Computer Science 61

- BSc (Hons) Computer Science 63
- BSc (Hons) Computing 66
- BSc (Hons) Information and Communication Technologies 71

## Masters 75

# What is ExpoTees 2016

ExpoTees began back in 2005 as a small showcase event for students to demonstrate their final year projects. Starting from such humble beginnings the event has grown enormously over the years, however, the principle remains the same – to provide an opportunity for students to showcase their work and celebrate their achievements here at the School of Computing.

This is the 11th year of ExpoTees, the region's leading digital recruitment expo, and it offers you an opportunity to meet, chat to and maybe even recruit bright new talent for your organisation. This year's event is held over two days to accommodate 150 exhibits. The students selected are some of the finest examples of work produced by our final year students.

As always, the exhibits represent the full spectrum of subjects taught at Teesside University's School of Computing.

Our students carry out an in-depth exploration of a chosen subject and demonstrate their ability to research, analyse, synthesise and creatively apply what they have studied. Their project is in an area where they have gained an interest, either through a work placement or through their studies. Some students undertake projects with external clients that require project management to industry standard.

These innovative, research, design and development projects make an exciting and diverse showcase. We can proudly boast that our graduates achieve great success in industry, sometimes even fame. This is a superb opportunity to meet our rising stars of 2016 before they embark on their careers. We are pleased to be welcoming winners of the ExpoTalent, the 2nd year showcase event, along with some of our post graduates students, who will be exhibiting alongside the final year students.

## Day one

### Computer Science, Digital Media & Web.

Students will be demonstrating technically and academically demanding work, ranging from real-time visualisation of complex systems to innovative web-applications; advanced networking solutions to novel applications of Artificial Intelligence and robotics.

## Day two

### Animation & Visual Effects and Games.

Students will be demonstrating highly creative and technically challenging projects in the areas of 2D, 3D games, animation and visual effects, real and fantastical character modelling and texturing, innovative game designs, complex and highly detailed game environments.

# Charity breaks new ground with help from students

**Talented students at Teesside University have received praise from a local charity after they designed its new website.**

A team of four BA (Hons) Web and Multimedia students were given the task of creating a website for the Tees Heritage Trust (THT), a charity which rescues, conserves and finds new uses for neglected, historic buildings in the region.

The project was designed to give students an experience of what it is like to work for a real client. They set about researching the charity, liaising with members, photographing projects and designing and creating the website.

Tees Heritage Trust were delighted with the results and say the new website makes its work more visible and raises the profile of the Trust.

Charles Morris, Chair of THT, said, 'We rely completely on volunteers and we contacted the University to see if they would be interested in working with us.'

'From the beginning the students were extremely professional and ambitious. They talked to us about what we wanted and provided a first class service.'

'The result is fabulous – we have a very well presented and informative website which explains about the work we do and will encourage more members to join.'

The four students involved in the project were Tom Armstrong, Sam Stevenson, Adam Angell and Steven Dent.

Steven said the experience has given him the motivation to undertake additional freelance work. He added, 'It has been a great project and working for a real client allows you to put

everything you learn on the course into practice.

'It has definitely made me more confident and it is really nice to know that the charity is happy with our work.'

Myriam Mallet, senior lecturer in digital media & web, said, 'We made the experience as real as possible in terms of working with external clients. The students were able to liaise directly with the charity and work to a specific brief.'

'They really threw themselves into the project, going out on site visits and working long hours. The results are fantastic and the fact that members of the Tees Heritage Trust wanted to visit the University to personally thank the students speaks volumes about the quality of their work.'



l-r Tom Armstrong, Charles Morris, Chair of Tees Heritage Trust, Sam Stevenson, Adam Angell, Steven Dent

# Oscar success for graduates



**Graduates from Teesside University worked on the visual effects for *Ex Machina*, which picked up the Academy Award for Visual Effects.**

The critically acclaimed *Ex Machina* tells the story of programmer Caleb Smith who is invited by his employer, the eccentric billionaire Nathan Bateman, to administer the Turing test to an android with artificial intelligence.



Sana Jamie

Teesside University graduates Sana Jamie and Natalie Rocks, who both achieved first class degrees, were involved in the visual effects for the sci-fi thriller. Sana completed a BA (Hons) Computer Animation in 2013, while Natalie finished her BA (Hons) Creative Visualisation in 2010.

Previous ExpoTees award winner, Sana was employed at Double Negative when he got the opportunity to work on *Ex Machina*.

'I always wanted to be able to see my name in the credits of a film on the big screen, and I was lucky enough to see this happen,' explained Sana.

'*Ex Machina* was one of the first projects I was able to help out on when I joined Double

Negative. The experience was particularly exciting as I was very new, and having spent my life watching sci-fi films as a fan, to be able to finally be part of the production process of a film felt like a watershed moment.'

Blair Stent, a Digital City Fellow at Teesside University and founder of film production company The Office Above, also worked on *Ex Machina*. He was responsible for remotely operating several cameras at once, making sure they moved precisely, together and individually.



Blair Stent

Visual Effects supervisor Andrew Whitehurst from Double Negative was a keynote speaker at this year's Animex international festival of Animation and Games at Teesside University, and he flew from Animex to LA to collect the Oscar that won best visual effects at the Academy Awards 2016.

Teesside graduates were well represented at this year's Oscars. Phil Shoebottom, who graduated with a BA (Hons) Creative Visualisation, worked on *Inside Out*, which won the Oscar for Best Animated Feature. Several other of our graduates

worked on *Star Wars, The Force Awakens*, which was nominated in the Best Visual Effects category.

The University has a stellar reputation as a leading institution for computer games, visual effects and animation, with graduates working all over the world at some of the industry's leading companies.

Ellie Serafin, principal lecturer and section head for animation & visual effects at Teesside University, said, 'We had strong representation at the Oscars this year and it is fantastic to be able to celebrate the success of our graduates who have worked on such high profile films.'

'Our students are passionate about what they do and it is great to provide them with the skills and foundations to go out and succeed in the industry. To have their work contribute towards an Oscar is an incredible accolade for them as individuals and for us as a University.'

Sana added, 'Teesside University prepared me well for the visual effects industry. I do believe that you have to make your own luck by putting in as much effort as possible during university, but I also recognise that it is highly likely I was able to find work in a VFX studio as a direct result of Teesside's great connections with the industry.'

# RTS award for Teesside University filmmaker

**An award winning filmmaker has returned to Teesside University to be presented with a trophy for her animated short film.**

Previous ExpoTees award winner, Domareen Fox received the Student Animation Award at the recent Royal Television Society's Regional Awards but was unable to attend the ceremony because she is working for a German animation studio.

However, she was able to take advantage of a break in her busy schedule to fly back to Teesside University and pick up the award from Dr Simon Stobart, Dean of the School of Computing.

Domareen, who is originally from Skelton in Cleveland, received the award for *Dresslocked*, a three minute 2D animation exploring body dysmorphic disorder through the struggles of a young woman who can't decide what to wear in the morning.

She produced the film as part of her BA (Hons) Computer Character Animation.

Since graduating last year, Domareen is now working as an Art Director for Studio Soi, an animation studio based near Stuttgart in Germany, which has produced

the *Gruffalo* and the *Gruffalo's Child* animations.

Her job has a range of responsibilities including managing a team of artists, helping with the design of the show and assisting with the marketing.

She said, 'This is my ideal job. I was one of those people who came to university knowing exactly what it was that I wanted to do once I graduated.'

'At Teesside I got all the support I needed to achieve that goal. The staff were fantastic and the courses I took, not just those that were part of my degree, were wonderful.'

'I loved my time here.'

Domareen found out about winning the RTS award whilst in a meeting in Germany.

She added, 'I was in a review session with some of the artists and I suddenly started getting a lot of messages.'

'I couldn't believe it. It was really lovely to get this recognition.'



## Mauricio Cadenas

Software developer associate at Accenture Limited



**I learned how to program on the job, adding value to Accenture's clients and the business.**

Mauricio studied computer games design at Teesside University. 'Whilst at University, I gained valuable knowledge from an experienced School which I brought to my software developer role at Accenture. I learned how to program on the job, adding value to Accenture's clients and the business. I enjoy the opportunity to learn from others at the same level as well as those with more experience.'

Mauricio took full advantage of

the training opportunities available at Accenture. 'I learned C, C++ and how to program in Java. And I completed an introduction course in Pearl, a language used for common scripts.

'While the work is challenging, I enjoy it because it's extremely interesting. I feel that I've made an impact on my work environment. I never get bored at work - I'm working on interesting projects and always learning something new. We work with the latest software

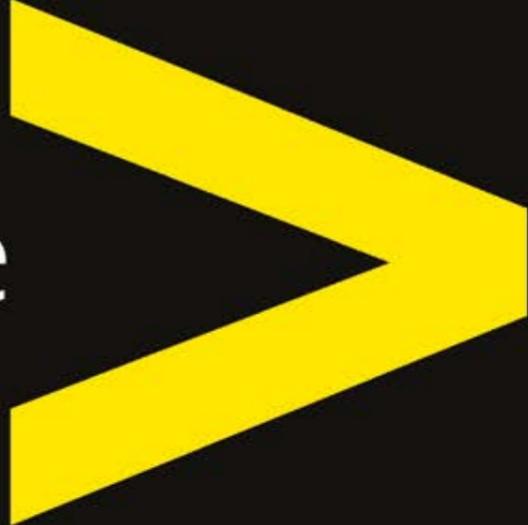
and leading-edge development tools on high-performance projects. I've been able to make valuable contributions to clients.'

Mauricio is keen to develop his skills as a software developer and take advantage of the training opportunities and knowledge sharing available at work. 'As I learn more, I hope to progress to positions and projects that challenge me. I would like to work towards a software development team lead role in the near future.'

**accenture**

High performance. Delivered.

Strategy | Digital | Technology | Operations

be  you imagined

Welcome to Accenture, one of the world's leading providers of management consultancy and IT services. Are you ready to put yourself to the test on business' biggest challenges? Do you want to work in an environment where the bar is raised every day and high performance is just the entry ticket? Think you're up to it?

We have opportunities for you to develop your IT skills and careers.

Find out more at:  
[accenture.com/newcastle](http://accenture.com/newcastle)



**Be greater than.**



# ExpoTees visits London to meet industry's leading players

Animation and Visual Effects students from the School of Computing had the opportunity to exhibit their work at Double Negative's London studios last summer.



Students showcased their portfolios and promoted their ideas to recruiters from the AVFX world, while networking with industry professionals and getting tips on the interview process and careers advice. As well as the ExpoTees event, the School of Computing's future graduates took a tour of prominent AVFX studios, including Cinesite, The Mill, Industrial Light & Magic, Glassworks and Blue Zoo. The managing director of Studio AKA,

Philip Hunt, took time to deliver an informative and interesting talk from a 2D animation perspective. Students exhibiting at ExpoTees in previous years have gone on to work on illustrious film and games titles after graduating, for some of the industry's top companies, and many of them cite ExpoTees as key in their career development. Here's a flavour of what the participants of this



year's ExpoTees London had to say about the event:

- I feel more confident in my skills, and it was enlightening to hear from people inside the studio about things so specific to us
- It was a chance to see what the studios are actually like! They now seem somehow closer

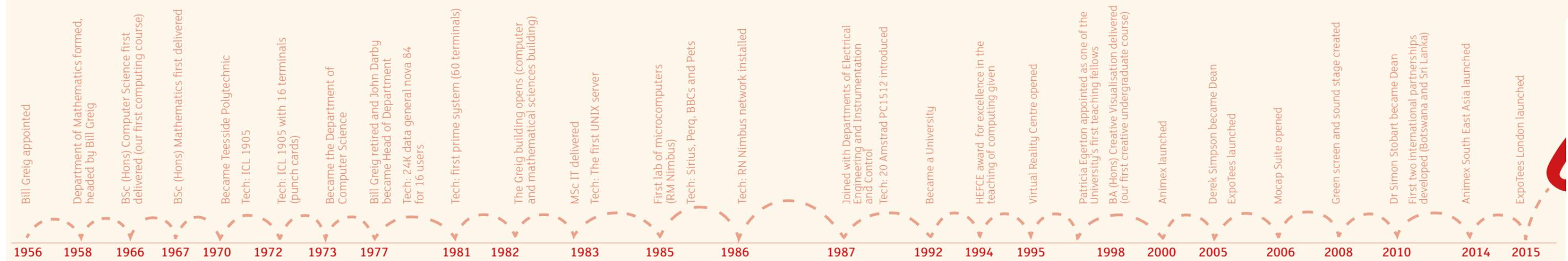


- I'm now looking forward to applying for jobs rather than being really scared about it
- Seeing the artists working at Dneg was awesome. They were just like us in the university labs except they were modelling some really awesome stuff!
- The feedback provided by the experience artist in ExpoTees London was really valuable and will be helpful for the future to secure a good job in the industry.
- We had a golden opportunity to share our work with recruiters and higher-up staff for jobs or feedback. I think people really benefitted from it.
- It was a perfect networking opportunity. We got the chance to share our work with industry professionals and they were more than willing to discuss our work, and tell us more about what the industry is like.



We are extremely grateful to Double Negative for their kind hospitality and loan of the space for the exhibition, ExpoTees London 2015 was a fantastic experience and a great success.

## 50 years of computing at Teesside





**THE BIGGEST SHOWS  
THE BRIGHTEST TALENT**

**GO GLOBAL WITH  
OPPORTUNITIES ACROSS  
OUR STUDIOS**

**KICK START YOUR  
CAREER WITH  
MPC ACADEMY**

**MPC**

**MONTREAL VANCOUVER LONDON BANGALORE**

**MOVING-PICTURE.COM**



## Animation & Visual Effects

These projects illustrate the level of expertise possessed by students on the School's animation and visual effects courses. The projects allow them to focus on a range of skills that enable them to move effectively into an industry setting and be productive from day one.

Graduates from these courses have gone on to achieve success in major animation and visual effects studios in the UK and around the world such as Framestore, Double Negative, Moving Picture Company, Cinesite, Pixar, DreamWorks and Industrial Light & Magic. Some have forged successful careers in games development and industries such as medical, oil and gas, and architecture. Others have become successful entrepreneurs running their own studios.

Teaching in this area is backed by Creative Skillset, which has accredited our BA (Hons) Computer Animation and Visual Effects, and BA (Hons) Computer Character Animation.



Teesside University is ranked #18 in the world in the Animation Career Review list of top international schools. Our students have access to state-of-the-art facilities with fully equipped 2D and 3D animation studios, life-drawing studios, motion-capture studio, sound stage and recording studio. Our graduates have gone on to work for companies such as Pixar, DreamWorks, Framestore, Sega and Ubisoft.

### Undergraduate

- Games and Animation, Art Foundation Year
- BA (Hons) Computer Animation and Visual Effects
- BA (Hons) Computer Character Animation
- BA (Hons) Digital Storytelling
- BSc (Hons) Technical Direction for Visual Effects\*
- MComp (Hons) Visual Effects\*

### Postgraduate

- MA Computer Animation and Visual Effects
- MA Producing for Animation and Games\*
- Research degrees

\*Subject to approval

### Graduate Profile

## Emilis Baltrusaitis BA (Hons) Computer Animation and Visual Effects

Emilis worked hard and was serious about his dreams and ambitions. Teesside University helped him achieve.



A search for the top UK universities for animation first led Emilis to Teesside. Now he creates backgrounds digitally for shots within movies such as *Spectre*.

'My decision to pursue a career in Animation and Visual Effects came about during the last few years of high school, when I spent a lot of time watching 'behind-the-scenes' and 'making-of videos' included in the extras section of various DVDs. Something about working behind the curtains on such exciting high-level, high-skill projects really appealed to me, so it was only natural for me to pursue an education within this field.

'I searched for the top UK universities in animation & visual effects, which is how I found out about Teesside University. I chose Teesside over other universities mainly because it left a great impression on me during my interview and at the open day, something that the others failed to do to the same extent.

'The modules at Teesside helped me refine my skills by working on a variety of projects, both individual and group and I've had the chance to learn different software packages that are used professionally throughout the visual effects and games industries. The 24/7 access to labs allowed all me to do work on my own schedule, no matter how ridiculous my sleeping patterns became.

'After graduating I received an internship at Double Negative visual effects company in London for three months. The first month provided me with additional training to supplement what I had already learned at university, while months 2 and 3 involved me working on the James Bond movie, *Spectre*.

'Afterwards, I was offered a full time job at the same company and I've been working on *Alice Through the Looking Glass*. I will continue honing my digital matte painting skills, while working on concept art, as well as other aspects of the CGI pipeline in my spare time. I aspire to move up

within the VFX industry to the point where my creative decisions have a real impact on large projects.

'In the far future, once my skills have matured, I would also like to develop and publish my own projects and use them to tell stories that are currently still only circling within my head!'

\*Teesside University is ranked #18 in the world for top international animation schools, according to Animation Career Review.



### BA (Hons) Computer Animation and Visual Effects

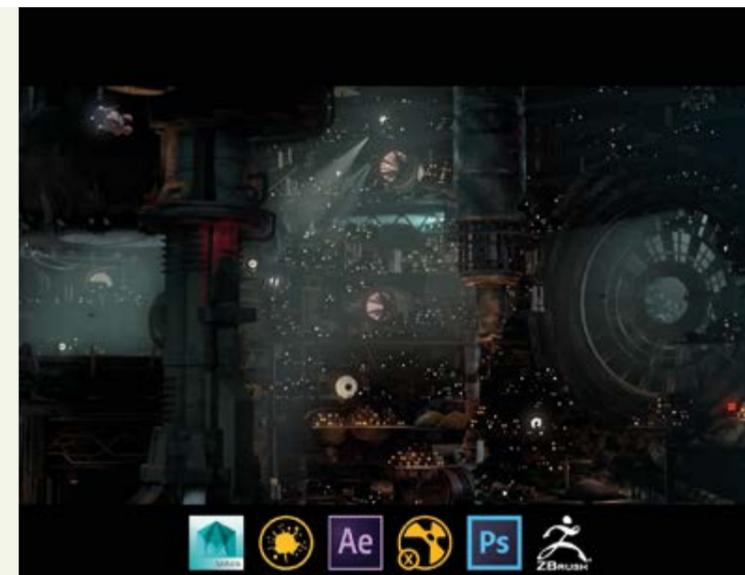


## Michael Bryant Creating an environment for a visual effects scene

The idea of delving into another world through the art of visual effects and environment design has always intrigued me. I find it fascinating that an environment in itself can tell a back story, and provide a level of complexity that makes it real to its audience. I have created an environment based on the sci-fi genre, which depicts a settlement in the far reaches of space. The piece demonstrates an array of technical ability and skill, using a full pipeline of software and latest industry techniques.

I aim to secure a job in the film industry, leading to look development – an area I'm keen to pursue. Through this project I have developed some of the core skills required in the visual industry.

Software: Autodesk Maya for modelling, The Foundry's Mari and 3D Coat for texturing, Mental Ray for lighting and rendering, The Foundry's Nuke, Adobe After Effects and Premiere for compositing.



## Sarah Ellis Road hog

Inspired by the concept of a literal and visual representation of the term road hog, I have designed, modelled, textured and lit a car crash scene.

This was first and foremost a modelling project and I was keen to push those skills further. I created a variety of assets utilising hard surface and organic modelling techniques, as well as texture and lighting – all essential for creating a dramatic atmosphere.

My scene consists of a road side motel, a 1968 Chevrolet Camaro Z/28 and a humanoid warthog. All are linked by a narrative based on the concept. To model my motel and Camaro I used Autodesk's Maya. I also used this software for lighting, texturing and rendering. I created my humanoid warthog in Pixologic's Zbrush. I used Adobe Photoshop to alter and create textures. Final touches were added using The Foundry's Nuke.



## Chloe Ewart Small worlds, compositing, modelling, texturing and lighting project

I was inspired by Mary Norton's classic children's novel, *The Borrowers* to design and create two environment scenes. The first scene integrates my own 3D models into a live action establishing shot of a forest. I aimed to achieve a balance between fantasy and the real world.

The second scene is a complete 3D set, realistically textured, lit and rendered. The scene contains appropriately scaled appliances and furniture that I designed with the inventiveness of a borrower in mind.

I used Autodesk Maya to create hard surface models as well as to light, texture and render my scenes. Pixologic's ZBrush was used for the organic models, for example – the forest tree stump. Nuke and After Effects were used for final composites and rotoscoping.





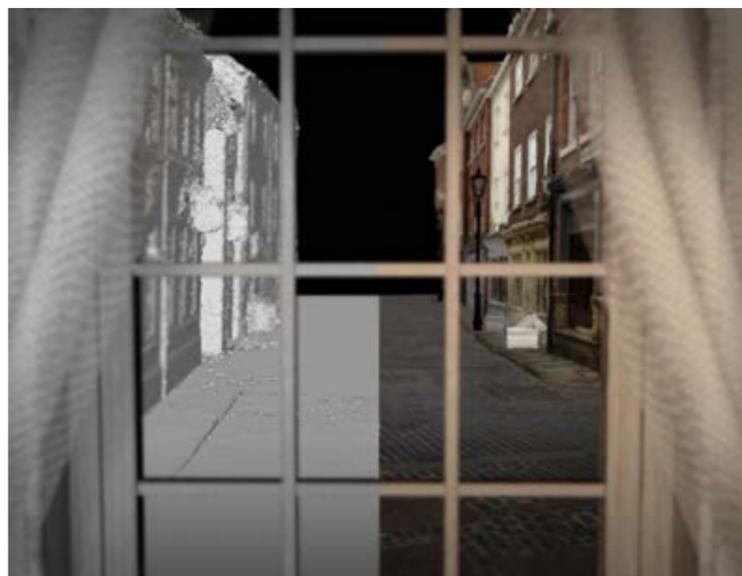
### Charlee Fearn

#### The exploration of bringing fantasy CG characters into a real world environment

Character modelling has always been an area of VFX that I have been interested in. For my final year project, I chose to expand my skills in this area by designing and sculpting two fantasy characters. I composited these two characters into live action footage. This process enhanced my knowledge of the post-production process.

I really enjoyed this project, and I was able to explore different techniques and software for modelling and texturing, whilst also learning more about lighting and the compositing side of VFX.

I used Pixologic ZBrush for modelling and UV unwrapping, then 3D Coat for texturing. I used Autodesk Maya to light the characters, before compositing them into the footage in The Foundry's Nuke.



### Rose Gibbin

#### Compositing portfolio

My project consists of a short sequence combining a range of compositing and visual effects techniques. I began the process by defining exactly which of these features I wanted to showcase and developed my ideas from that as a starting point.

The sequence features a scene-setting camera movement which dollies backwards through a Victorian-style side street and through a café window, revealing the two main characters inside, conversing over tea and cakes. My project allowed me to develop skills throughout the production pipeline, from costume and prop-acquisition, shooting green-screen footage and recording camera data to photo-telemetry, texture projection and modelling. All of these skills contributed to the main event – the compositing stage. This is where the sequence came together and I could showcase my skills as a compositor.

I used the Foundry's Nuke, Autodesk's Maya, Agisoft Photoscan and 3D Coat.



### Jade Hallett

#### Entrapment

My project is a concept for a cartoon series, intended for a tween/teen audience. It follows Ashlyn, one of a trio of dreamwalkers who stop the nightmares of their clients by solving their deepest mysteries. The trio investigate the foreboding darkness as it spreads throughout the realms, threatening to destroy dreams forever.

I spent my project developing a pitch bible which includes the story arc, environment designs, model sheets and character back stories. It also features a script and animated storyboard, complete with sound, for the pilot episode.

I intend to pitch my project in the near future, with the ultimate goal of impressing a distributor, getting my project made and kick-starting my career in pre-production.



### Callum Joplin

#### Gag reflex

A short horror movie centred on a woman coping with the consequences and gruesome effects to her body following a one-night stand.

My short film covers each stage of the visual effects pipeline from design to compositing. The film builds tension and intrigue until its dramatic and horrifying climax.

Combining practical as well as computer generated effects, I hope to create a realistic dark movie that will hold its place in people's minds long after they stop watching.

With sculpting, texturing, animating, rigging, lighting, rendering, fluid simulation and compositing, a wide variety of skills have been applied to the project to create a strong and influential piece of film.



### Jonathan Junn Kitt Lau

#### The orc

My project is a modelling and rigging piece. I have always been interested in modelling and sculpting my own characters so I decided to pursue this area of interest for my final year project.

As part of the project I created a face rig and a muscle system driven body rig with textures, clothing and props to bring my character to life.

I used Pixologic's ZBrush for modelling and texturing, Autodesk's Maya for rigging and rendering and brought it into the Foundry's Nuke to create the final product.



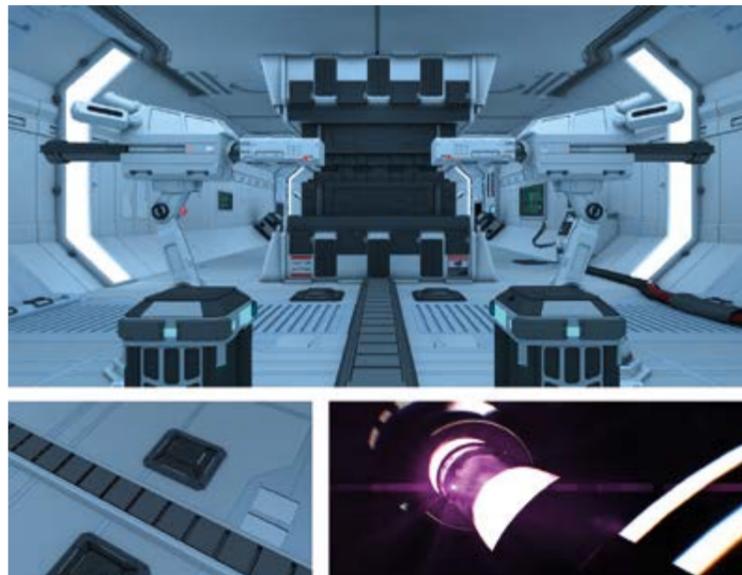
### Alex Papasozomenos

#### Simplicity

I created Simplicity to showcase my skills in compositing and all aspects of 3D from modelling to matchmoving and lighting. I chose the format of a music video as I thought this would make my project fun to work on whilst still allowing me to explore my creativity and apply my skills.

Throughout the project I have come to understand the value of planning ahead. I've also developed a higher understanding of 3D tracking and matchmoving, simulations and general compositing.





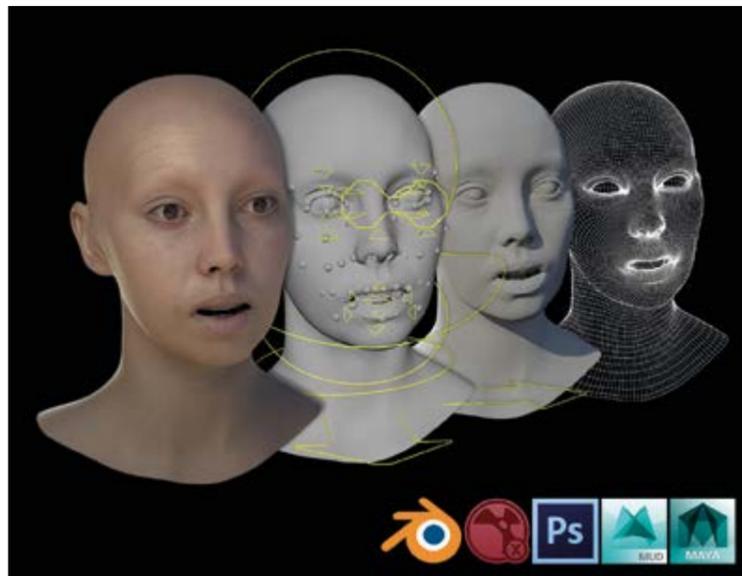
**Gaute Sele Svendsrud**  
**Machine**

The main goal of my project was to create an animated film that would visualise music. I also wanted to develop my skills and the styles I enjoy working with, with a focus on modelling and animation. I used Autodesk's Maya for all modelling and animation, alongside Adobe Illustrator and Photoshop for textures. I rendered the film using Chaos group's V-ray and did my post-processing work in The Foundry's NukeX and Adobe After Effects. I made the soundtrack myself using Ableton Live 9. Making the soundtrack allowed me to make changes to the piece when needed – this gave me a level of control I wouldn't have had if I'd used an existing piece of music.



**Bethan Claire Williams**  
**Environments**

I'm fascinated by photo-realism, specifically the ability to trick an audience into forgetting that what they are looking at is CGI. My professional goal is to be a look development artist. The aim of my project was to create two scenes – developing my skills in modelling, lighting and texturing using an efficient, professional workflow. The work I am exhibiting is a Victorian styled hallway and forest. My two scenes feature a range of different models, contrasting light set ups and textures. I have experimented with Arnold to expand my skills.



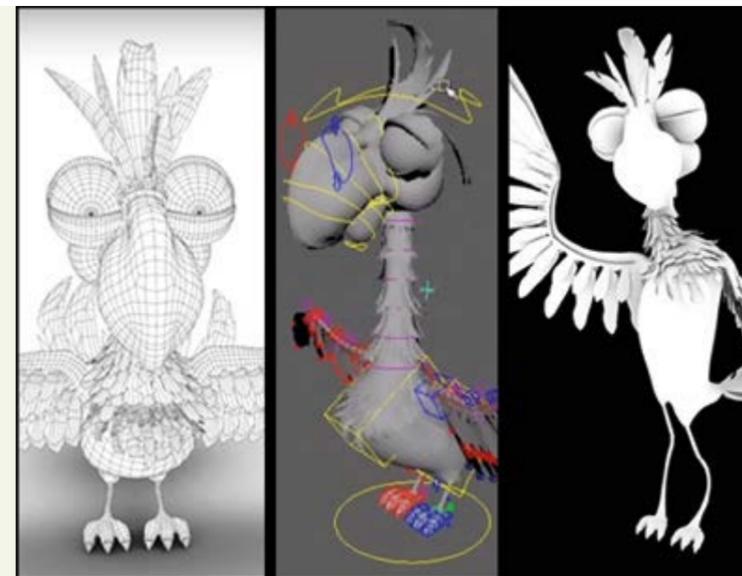
**Sam Oliver Swinnerton**  
**Realistic facial rigging**

I am showcasing my advanced facial rig. It is tailored to allow the animator to have comprehensive control over the expressions and movements that are possible on the human face. To demonstrate the functionality of the rig, I created a full lip-sync and head performance. The final outcome was aided by my research on the muscle structure of the human face, as well as my studies on the uncanny valley phenomenon.



**Blanche Xie**  
**Character rig**

Rigging is an important link of the 3D film production process. Before a 3D character model can be handed over to the team of animators, it must be bound to a system of joints and control handles so that the animators can pose the model. It's like making a puppet – the modellers build the body, riggers take care of adding control lines and the animators are responsible for movement on the stage. Facial expressions are the most important part of the whole process as an audience gains an understanding of a character's emotions. I've developed a tool to simplify rigging facial works and save time for riggers or hobbyists. I've explored the rigging system in Autodesk's Maya to build an automation system using different technology to provide a quicker workflow for riggers. I've also explored different ways to rig models to match different cartoon styles such as 3D rendering to 2D modelling, or sharply exaggerated shaping in animation.



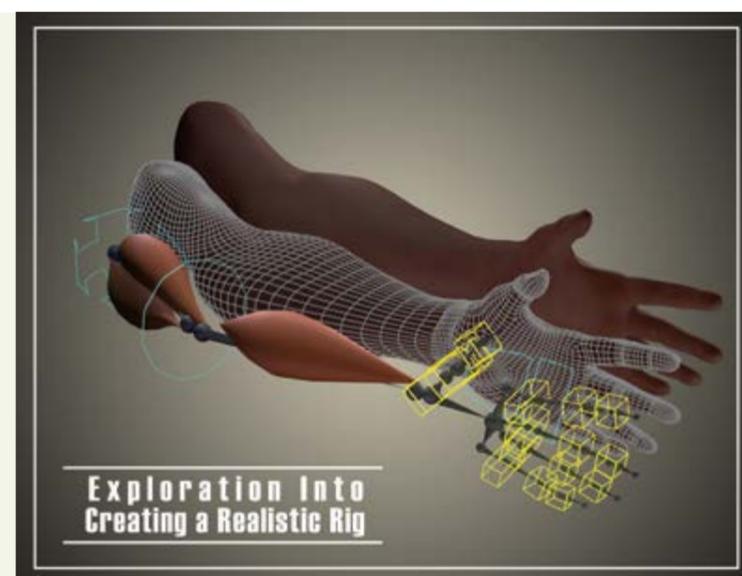
**Vicky Wainwright**  
**Dreamwalkers**

My project is a concept for a cartoon series, intended for a tween/teen audience. It follows Ashlyn, one of a trio of dreamwalkers who stop the nightmares of their clients by solving their deepest mysteries. The trio investigate the foreboding darkness as it spreads throughout the realms, threatening to destroy dreams forever. I spent my project developing a pitch bible which includes the story arc, environment designs, model sheets and character back stories. It also features a script and animated storyboard, complete with sound, for the pilot episode. I intend to pitch my project in the near future, with the ultimate goal of impressing a distributor, getting my project made and kick-starting my career in pre-production.

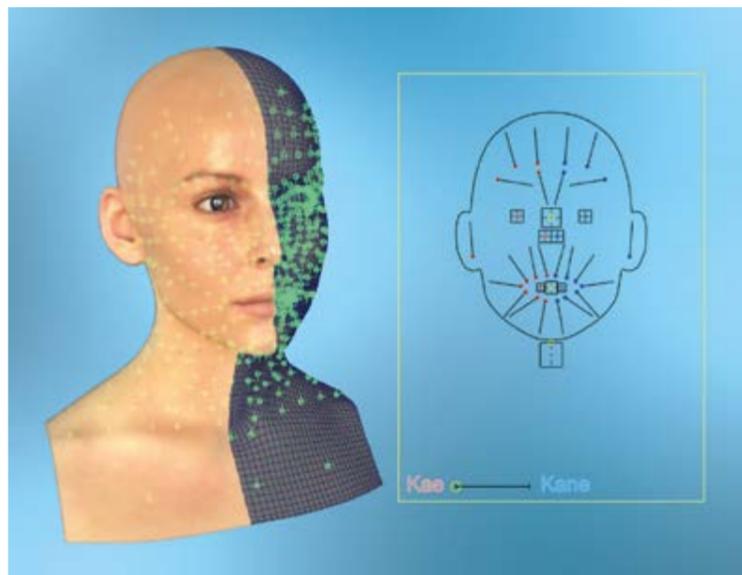


**Lewis Hawkes**  
**Realistic arm rig**

My project focuses on studying the human hand in great detail. I've explored the way the hand moves, the way it deforms, and the veins and bones that move around in the hand. My study allowed me to accurately model, texture and rig a realistic looking hand. I create a rig that simulates a realistic hand, showcasing my abilities as a rigger, allowing me to stand out. I have created a rig that uses advanced techniques, giving the most sophisticated and realistic movement as possible.



Exploration Into Creating a Realistic Rig



### Ruthie Joy Nielsen

#### An exploration of facial rigging techniques

Alongside showcasing several rigs and scripts created throughout my degree, my project also presents the rigs created within my computer animation project, in which I chose to explore facial rigging techniques. Facial rigging is a process used in the animation of a face to enable movement of a computerised model. This requires a good understanding of facial anatomy and expression.

My showcase includes a realistic rig and a cartoon-styled facial rig. The purpose of the rigs was to compare the techniques used within both rigging styles. My project enabled me to learn and utilise the optimal techniques necessary for creating rigs for different character types. The facial coding system and the muscles of facial expression were referred to throughout the creation of the realistic rig to ensure accurate deformation. The cartoony rig, however, focused more on the use of squash and stretch rigging techniques.



### Adam Williams

#### Earth, wind and fire

I am exhibiting a VFX showreel, demonstrating the skills I have developed in 3D software such as Side Effect's Houdini. My showreel illustrates high quality 3D simulations in dynamics, pyro, fluid and particle effects.

During the production of this work I mastered Side Effect's Houdini and Next Limit Technologies Realflo from scratch. This included the un-restrictive procedural system of Houdini. Alongside this I strengthened my knowledge of Maya dynamics. As my skills developed with these pieces of software I became more comfortable with creating visual effects based around 3D simulations.



### Ying Xi Wong

#### Exploring matte painting techniques

For my final year project, I've created matte paintings of different time periods from the Sengoku period of Japan, to 1970s streets, to a futuristic city. I studied colour theory, composition, and linear perspective. I believe these fundamentals of painting increase the realism of matte painting.

I created three different shots using photography, live-action footage, and concept art. The workflows of these shots were similar. To create the shots I used several software packages including Adobe Photoshop, Autodesk Maya, Mental Ray and The Foundry's Nuke.



### Christian Bernt Arnesen

#### Thieving around

I've created a short, 3D animated movie about a thief's mission to steal a rare stone from a museum. The character is introduced to a set of different hindrances that need to be overcome to fulfil the mission. The movie is intended to be an appealing and funny story that is aimed at audiences of any ages. My primary goal for this project was to show off and improve my skills as an animator in terms of animation techniques, body mechanics, and acting performance. The primary tools I used to finalise the project were Autodesk's Maya, Adobe's Photoshop, 3D Coat, the Foundry's Nuke and Adobe's After Effects.



### Ollie David Cooke

#### Goat and banister

During my time at Teesside University, my interest and skills in story boarding, character design and 2D animation have grown. In my final year, I knew I wanted to create a short animation with original audio, original characters and the highest quality of animation possible.

My 2D short film is inspired by my love of Saturday morning cartoons and comic books. While catching up over a pint, we learn Dave has been traumatised by his shopping experience, and Heron is consoling him. The animation shows my skills in character animation, design and acting. My film could be used as a pitch to studios as part of a series of short animations.

I used Toon Boom's Animate Pro, Adobe's Premiere and Photoshop software. I am also comfortable in Autodesk's Maya and Pixologic's ZBrush.



### Marianne Eie

#### Dream walker

I focused on developing my skills as a visual development artist and expanding my pre-production skills. I created an art book containing the visual development of characters, creatures and environments for a potential 3D animation fantasy movie named Dream walker.

The story introduces Enya, a young woman drawn into a parallel world between reality and dreams – a place in the process of being taken over by nightmares. Enya teams up with a grumpy young man, one of the few remaining guardians of the realm. Together they set out to find a way to return Enya to her rightful world, and also attempt save the realm itself.

I researched several visual development and concept art books and explored a multitude of visual artists and styles. I created my visual designs in Adobe Photoshop and used Autodesk 3ds Max to create simple scenes for some of the environmental concept art. I used Blurb.com to create and design the physical book.





**Thomas James Fordham**  
**Steam**

I'm exhibiting three rigs; a biped, a creature and a vehicle. I've presented my rigs through screen captures detailing how they work and what they can do. I've also created some animation to illustrate the rigs in action.

Each rig contains models that I have created myself and each rig is user-friendly. The project showcases my skills in rigging. The biped and creature have an extra level of complexity with the addition of a muscular system.



**Sam Forster**  
**Advanced creature animation**

I have always had a passion for animation, and bringing characters to life. This year I created a showreel project to expand my animation skills and create some advanced creature body mechanics focusing on different dinosaur and dragon behaviours.

I've also created a short dog lip sync piece, to apply my existing skill set to a more advanced lip sync acting piece. These shots have been created using Autodesk's Maya.



**Nicole Charlotte Haigh**  
**Movement through animation**

I've created a show-reel of short animation studies, displaying the skills I have gained as a character animator throughout my studies. As I wanted to explore as many areas of 3D character animation as possible, I created a showreel that features a mix of quadrupeds and bipeds. Fantasy creatures, animals and people make up the shots which are all four to five seconds long. Each shot is a study of movement in different scenarios – flight, speed, flexibility and emotion.

My first shot is a flight sequence of a dragon bringing home its prey, the second is a horse galloping through its surroundings, the third is a body mechanics sequence showing an unexpected character doing gymnastics and my final shot is a comedic dialog sequence in which the character performs an unsuccessful operation. For all of my animations I used Autodesk Maya. I also used software such as Premier Pro to help create collaboration of footage used for reference purposes and NukeX for extra compositing.



**Ben Kocic**  
**Warrior on horseback**

I focused my attention on modelling and texturing. I sculpted a warrior on horseback, adding props and clothing to suit the style and era, including woven cloth trousers, leather boots, and a battle axe.

To create my model, I used ZBrush, Marvelous Designer, and KeyShot. Having always enjoyed modelling throughout my time as a student at Teesside University, I felt that focusing on modelling and texturing directly, would not only give me a great final product to display in my showreel, but would enhance my skills as a 3D artist as well.



**Karin Lauvdal**  
**MagnoJack**

I've created an animated commercial for a product called MagnoJack. The commercial is simple, informative and will hopefully enhance sales. The piece is 60 seconds long and features animation, text, models and voice-over. There is a royalty-free soundtrack playing in the background and a voice-over explaining the product and its use.

MagnoJack is a sack truck specially designed for handling household appliances. The simple but robust construction makes this the best trolley for handling big household appliances ([www.magnojack.com](http://www.magnojack.com)).

My project has enabled me to create a commercial for an existing product and to gain experience and preparation for the working industry. My main focus has been on the visuals, with short and easy to understand sequences followed up by an explanatory voice-over. This has been a great experience for me in terms of having a client and working with external client feedback.



**Zoe Bethan Llewellyn**  
**2D animation reel**

I've created a reel of 2D animation shots created with the purpose of learning and experimenting with TV Paint, a programme at the forefront of the 2D animation industry which combines digital and traditional animation arts. The reel consists of three or more shots, showcasing lip syncing, body mechanics and 2D FX.

My exhibit includes a detailed breakdown of the design and animation process, featuring the concept art and roughs that helped produce the final shots. It also provides a look at the workflow of the project that involved not only TV Paint but Autodesk's Maya, Adobe's Photoshop, Paint Tool Sai and After Effects.





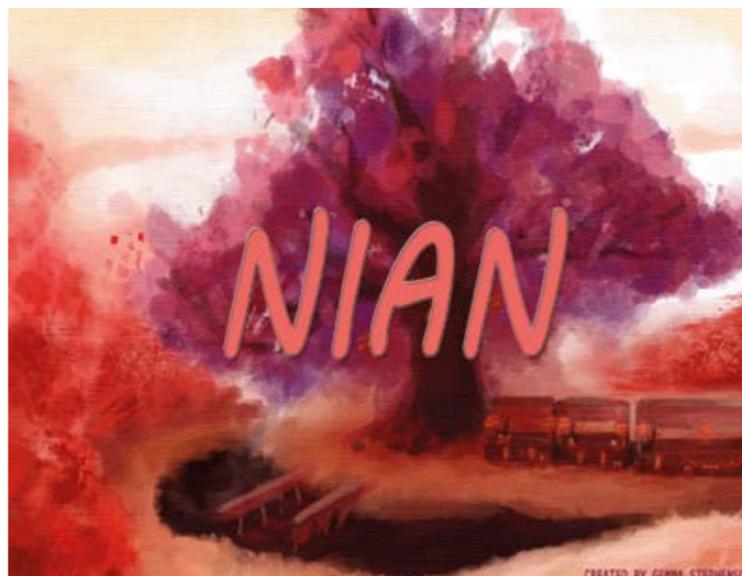
### Jessica Sham 3D world

I appreciate Disney's unique art style and themes. This is the reason I have chosen Disney's *The Princess and the Frog* character, Tiana, to focus my project on. My project is a 3D interpretation of a 2D scene. The scene is from Café Duke where Tiana is seasoning toast. I chose this scene to gain a better understanding of lighting, visual effects, compositing and texturing. It also helped me to enhance my modelling skills. I've created a character model and a scene to show a range of both hard surface and organic sculpts. I've also displayed the modelling capabilities required for securing a job in the industry. I used a range of software for my project including Pixologic ZBrush, 3D Coat, Autodesk Maya, Mental Ray, Adobe Photoshop, Adobe Premiere, Marvelous Designer and The Foundry's NUKE.



### Steven Woodhouse Advanced character acting for animation

During this year I wanted to illustrate my passion for 3D animation and further my developing skills, ready for industry. My project delved into character acting for animation and allowed me to explore what it is like to be a character animator. My first piece is a scene featuring a woman plotting and scheming, which helped me improve my fundamental acting skills for animation. My second piece is a pantomime performance of a man who thinks and acts like a primate. This scene allowed me to explore more scientific research, such as comparing the anatomies of primates and humans and the differences in their limitations. Both animations challenged me and I have completed what I set out to achieve and in turn, improved as an animator.



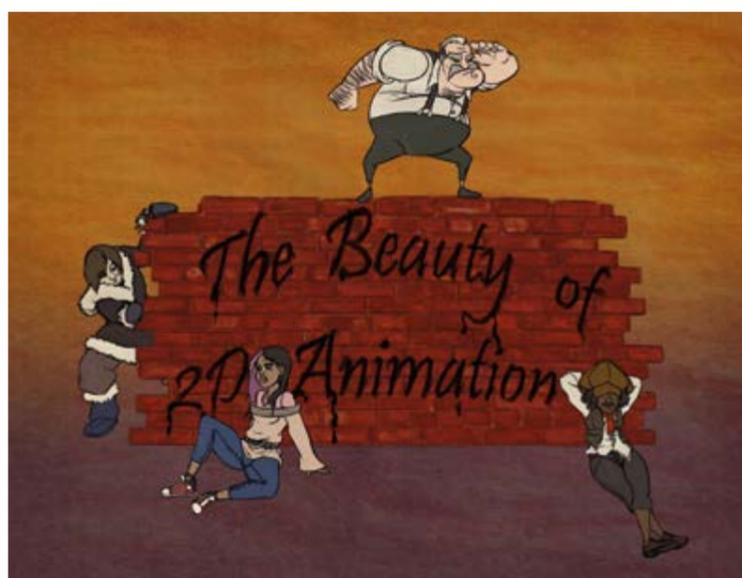
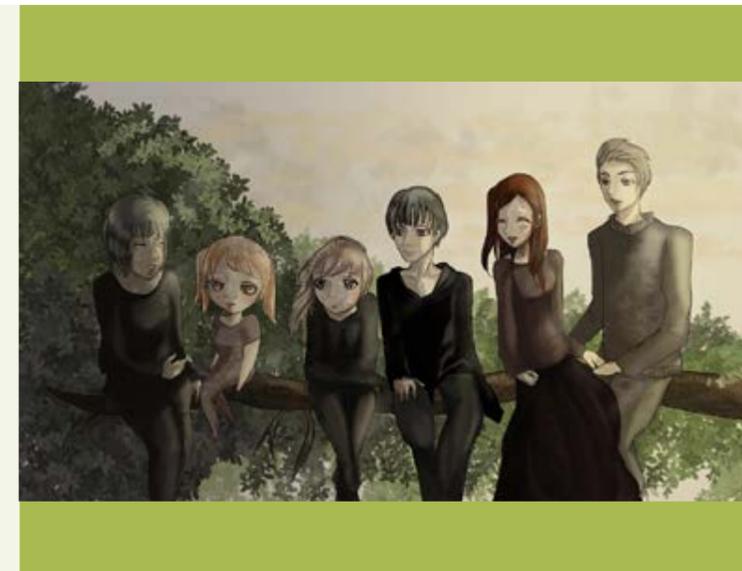
### Gemma Louise Stephenson Nian

I have produced a short, 2D animated film, showcasing my talents in 2D animation, colour theming, environment and character design. The film follows the short journey of a young woman named Kiiiba who steals a mythical golden mushroom from a sacred forest only to have a creature – the nian – follow her and hunt her down to have the mushroom grow again for her body. I aimed to portray nature in a powerful but fearful light using a monster as a guardian and highlighting that humans should avoid greed and respect nature. This project challenged my painting skills and allowed me to create an interesting and fun main character for the audience to engage with. I broadened my software knowledge throughout my production. I used After Effects, Premiere and Photoshop. I have developed self-management skills, efficiency and confidence through this project, alongside my ability to use colour theory to convey mood and perspective.



### Xinyuan Zhao Unique 2D

My project focuses on 2D animation with a series of pre-production processes, such as concept art of 2D animation (including character design and environment design), storyboard development, and camera movement within 2D animation. I have been doing 2D design since my first year of study, developing my own drawing style within this field. Previously I have worked in a gothic comic and animation style. For this project I focused on developing my drawing skills and style towards an original drawing and animation style. I aimed to use an original and developed visual style for 2D animation to make my project stand out. My project animation is 30-60 seconds long, in a modern contemporary style for a fantasy story.



### Victor Tshimanga The beauty of 2D animation

For my project I created a variety of 2D animations to display my animating skills. One of the motivations for my project came from my enjoyment and passion of watching cartoons from a very young age. Now that I have developed the basics and the methods of this art form, I want to become part of a team that creates a range of animated entertainment for all audiences to enjoy. I want my work to inspire future generations whilst reviving and maintaining the life of 2D animation. I plan on building my showreel further to demonstrate my potential as a lead animator.



### Ryan O'Gorman Advanced animation techniques

To broaden my skills as a character animator, I've created a number of different shots showcasing different types of animation. While a showreel of animated shots would allow me to do this, as a storyteller I wanted to link my shots through a consistent theme or narrative. I've created three short scenes demonstrating lip sync, creature animation, and advanced body mechanics, linked together in a chain of reactions. I animated in an exaggerated and cartoony style, in line with the type of work I would like to pursue in character animation for either film or TV. The software I used includes Autodesk Maya, Adobe Photoshop and Premier Pro.



# Don't be another code monkey



## Have your ideas matter with...



Amplience

Technologies we use at Amplience:



A few of the brands we work with:



We look forward to meeting you for a chat at ExpoTees. Contact us at [talent@amplience.com](mailto:talent@amplience.com) or visit [www.amplience.com](http://www.amplience.com) for more information.

### Graduate Profile

Jim Allanson graduated from Teesside University with first class honours in BSc (Hons) Computer Science. He is now enjoying working as a full-stack engineer for Amplience.



## Working at Amplience gives me the opportunity to work with a range of technologies to tackle new and interesting problems every day.

I joined straight after graduating from Teesside University, and now work as a full-stack engineer, covering everything from AngularJS web applications and high performance Javascript libraries on the frontend, to a diverse backend built from a variety of NodeJS and Java microservices. I've built big data processing solutions with Hadoop, and managed development infrastructure in Amazon Web

Services, all of which have given me the chance to refine my skill set and find the areas that interest me most.

Life at Amplience isn't all business, we like to play as hard as we work. We're all armed to the teeth with Nerf weapons, and an impromptu shootout can break out at any time. Lunch breaks can involve gaming, a pub lunch or even drone racing, and we schedule regular after-work

gaming evenings. The company regularly treats us to a drink or a meal out, and has even taken the team out to try archery, clay pigeon shooting and quad biking.

I consider myself very lucky to have found my way into a company like Amplience immediately after graduating, and I hope that anyone reading this will consider applying to join our fantastic team.



# Technical and creative computing courses

## So many great reasons to choose Teesside

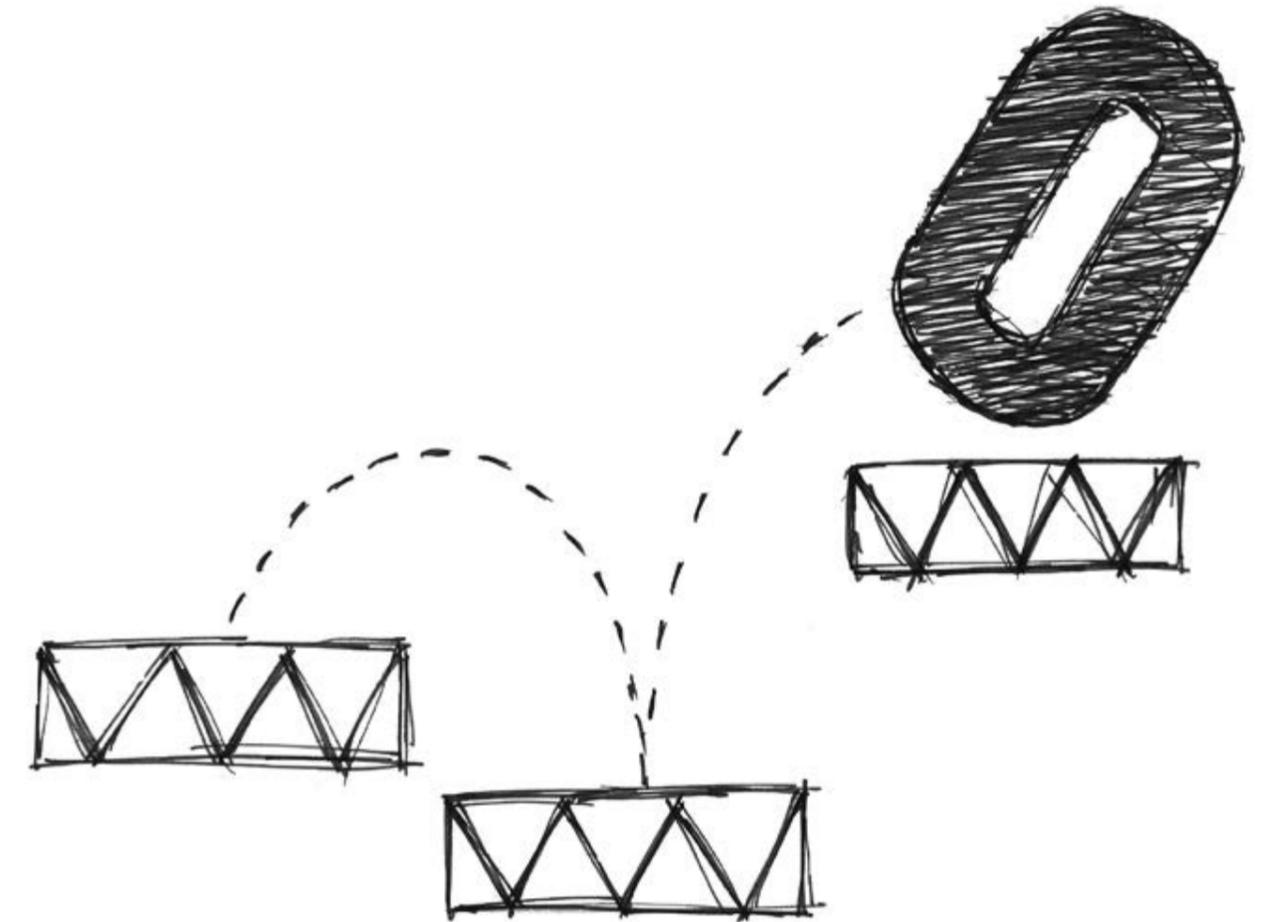
- > Nine out of ten students would recommend Teesside University to others (National Student Survey 2015)
- > Creative Skillset-accredited programmes considered amongst the best in the world
- > Home to the Animex International Festival of Animation and Computer Games [animex.net](http://animex.net)
- > Industry standard software and world-class purpose built facilities
- > Industry relevant courses with supervised work experience
- > Professional and business development opportunities before and after graduation
- > All labs and studios are open 24 hours a day during term time

Find out more:

T: 01642 342639

E: [scm-enquiries@tees.ac.uk](mailto:scm-enquiries@tees.ac.uk)

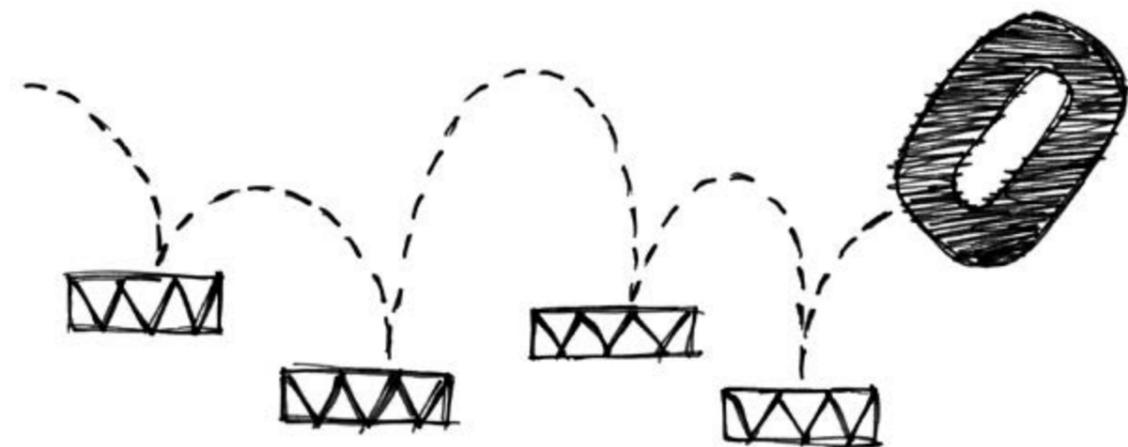
[tees.ac.uk](http://tees.ac.uk)



## Games

The birth of a computer game begins with imagination. The concept, the creation of a world, the development of characters to inhabit that world and subsequently the interaction of characters through game play, the game play structure, design of game levels, and programming are all represented at ExpoTees. These projects include storyboarding, and interface, level design, and technical demos. We're very proud of our graduates who are found at many leading games companies around the world.

We are proud that a number of our games courses are Skillset accredited. Additionally, our Computer Games Programming degree is also accredited by the British Computer Society.



Teesside University enjoys a well-deserved reputation in the exciting field of computer games. Our courses cover all aspects of the games industry, ranging from the highly creative area of concept art to the technical discipline of games programming. Our state-of-the-art facilities for games students include a motion capture studio, Kinect lab, a dedicated games lounge equipped with an array of consoles, and life drawing studios.

### Undergraduate

- Games and Animation, Art Foundation Year
- BA (Hons) Computer Games Animation
- BA (Hons) Computer Games Art
- BA (Hons) Computer Games Design
- BA (Hons) Concept Art
- BA (Hons) Indie Games Development
- BSc (Hons) Computer Games Programming

- BSc (Hons) Technical Game Development\*
- MComp (Hons) Computer Games Programming
- MComp (Hons) Games Development

### Postgraduate

- MA Concept Art for Games and Animation
- MA Games Development
- MA Producing for Animation and Games
- Research Degrees

\*Subject to approval

### Graduate Profile

## Emma Charnley BA (Hons) Computer Games Art

Creating 3D art seemed like the perfect choice for Emma.

Emma knew she wanted to do something related to art, but she wanted a secure job field to go into. She's now an environment artist at Creative Assembly.

'Once I realised that I wanted to study a games art course, I wanted to see which university was the best in the UK for this area. Teesside was at top of the list and my first choice.

'Teesside helped me discover what I wanted to specialise in within the games industry. This was because of the style of the course. In my first year I did a little bit of everything, animation, design and art. It gave me time to figure out what career path I wanted to take.

'My career has been fantastic since graduating. I secured a position before the end of my third

year as a general art intern at Creative Assembly on the DLC team. Half way through my internship I applied for an intermediate developer role at the same studio, I got the position and I'm now working specifically as an environment artist.

'I work quite generally within the Terrain team at Creative Assembly, which means I get to do a lot of different things. For instance; creating and generating vegetation, prop and asset creation, helping set up building blocks for the game world and terrain creation.

'I'm extremely happy at Creative Assembly. It's a fantastic company that really looks after its employees, so I would like to grow as much as possible there. My most immediate goal would be for a promotion to senior within the company.'



### BA (Hons) Computer Games Animation



## Elvis Benson Lord Nagafen is a custom rigged, fully animated dragon

Using Autodesk 3DS Max; this project displays a wide array of motions on a majestic mythical creature. From take-off to landing; the dragon homes in on the 12 principles of animation to create a realistic and believable animation set.

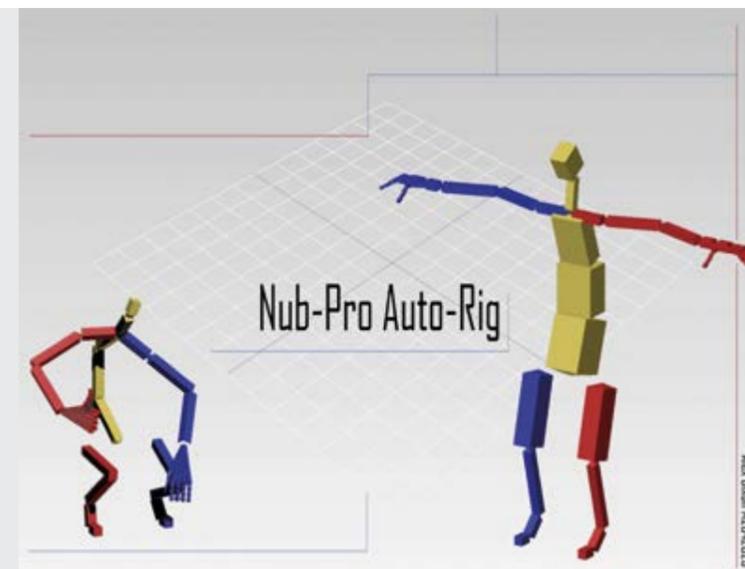


## Alex Dixon Nub pro auto-rigger

I've designed a freehand animation tool to address tedious and difficult problems that can appear during the animation process. It can be used by professionals and non-professionals, and shortens animation time whilst maintaining a good quality finish. It uses a visual workflow, meaning no complicated features appear in the product. The strongest feature of the tool is its ability to bypass frustrating issues for animators.

The plug-in creates a skeleton template for different character models and quadruped models through moving, rotating and scaling bones. The tool requires no professional experience and can be used as an exo-rig, meaning that you can use past rigs and animate them.

My project has received positive feedback through LinkedIn from industry professionals at Ubisoft and Epic. The tool has also received interest from students and indie companies after its first appearance at Animex and the Game Bridge gaming event as part of my product testing stage.



## Jack Edge Howard

Howard is a short film about a day in the life of a man named Howard.

This is a scene in which the character has to reluctantly do some work on his computer. At this point his chair begins to malfunction and he is forced to stop working and try his best to remedy the situation. The scene concludes with Howard being ejected out of his seat and through the ceiling.





### Maria Jaskowiec Cinematic techniques as a storytelling device

My project explores the power of game cinematics by presenting the same story using different genre-specific techniques. I worked in 3D Studio Max, Adobe Photoshop and Unreal Engine 4 to develop my skills in building camera and lighting rigs.

The animation is a mixture of hand animation and motion capture. This combination gave me a greater understanding of cinematic techniques and how they are used in industry. The final products are three cinematic sequences represented from different points of view in an effort to alter the viewer's perception of what is happening within the scene. The cinematic genres featured in this project include horror, action and comedy.



### Jerome Rodgers-Blake Chaotic elegance animated

The best gaming experiences are the ones that captivate us and leave their footprint in our memories. Unbound is an exhilaratingly fast paced, high action concept teaser trailer of a football game.

The main focus of my project was to develop and display quality, hand-keyed animation skills, as well as a concise understanding of cinematography through the use of intricate motions.

Developing this trailer broadened my knowledge of animation and cinematography. I used a combination of software packages including 3ds Max, Cinema 4D, After Effects, Photoshop, Premiere Pro and Final Cut Pro X.



### Liam Shields Lost Memories

The project aims to create a short animation suitable for all ages, to showcase and develop my character animation skills. My animation begins with a robot landing on earth in the distant future and searching for signs of anyone or anything alive. Then interacting with the inhabitants through music. In the pre-production I have tested my skills through the setting up of the characters by creating rigs which I hadn't attempted before. I also decided to use Morph targets which were new to me.

I have used Autodesk 3Ds Max, Audacity, Adobe After Effects, Adobe Premiere Pro and Adobe Photoshop.



### Dean Storey Character animation and facial Motion Capture

My final year project includes a 35-second animation featuring destruction, character animation, particle effects, and fully rendered lighting and texturing work.

I am also exhibiting my facial motion capture module (performance capture). This features full motion capture of the body and face using third party software and plugins.



### Christina Walker 3D interpretation of a 2D short

My project is a recreation of 2D animation in 3D software. I chose to recreate one of my favourite pieces, the short, *Thought of You* by animator Ryan Woodward. This fluid performance involves an affectionate interaction between a male and female.

The project was a challenge and gave me a lot of insight into the differences between 2D and 3D animation. I've improved my creative animation ability and researched and developed many new technical skills including rigging, skinning, particles, cloth and the use of post-process software. I also advanced my skills in the principles of animation and producing fluid motion.

I balanced the use of materials and techniques in 3D software with post-process enhancement to achieve the desired artistic output.



### David White Platformer animation set

My project focuses on the development and implementation of an interesting and complex animation set into a game engine. I created a selection of animations that covered the basic range of motions that a character would need to go through in a typical platformer game. I maintained a responsive control system allowing me to make my animations look good with very little room for anticipation.

To achieve the desired result, I created my own character model, gave it a custom rig and animated it by hand with key frames. Over the course of my production efforts, I developed my knowledge of Autodesk Maya and Unreal Engine 4 – both very important programmes in the industry.





### Matthew Atkinson Clones on campus

This project is a playable game demo built in Unreal Engine 4. My playable characters are free to roam around an environment based on Teesside University's campus, modelled and textured in 3ds Max. Combat is simulated in the form of matinee sequences. The two characters are based on real people. My character models are Teesside University students who I used in the motion capture shoot. The characters are voiced by the same people. In my piece, two students build a cloning machine in the hope that they can send their duplicates to university, while they stay at home and play video games. Their lives are turned upside down after discovering the cloning machine has been left on overnight and their clones have taken over the campus. Their goal is to reach the cloning machine and turn it off, taking down their duplicates in the process.



### Mathew Curran Live input bass guitar animation

As a passionate animator with a love for music, I've created a piece which combines the two. I developed a pipeline featuring a strong pre-vis of a bass guitarist using only live input techniques. Musical instrument digital interface (MIDI), gyroscopic devices and a pressure sensitive pedal are all included. My pipeline involves real-time conversion of audio data to MIDI data, passing through a virtual MIDI device to be detected by 3ds Max. Using a pose manager, reaction manager and a series of sliders everything can be recorded using motion capture controllers. Once recorded the system takes about 30 seconds to reduce 400 key frames – an effective method of creating animation for a guitarist. Similar methods could be used to upscale to a six string guitar. I'll be presenting a live demonstration at my stand and I'd love to chat and answer questions. I'll also display a polished rendered animation, as well as a 'making of' film. This project enhanced my technical animation and problem solving skills, and there was never a dull moment.



### Lee Parks Fighting the motions

The aim of this project was to create a highly polished hand animated sword fight sequence, focusing on body motion and cinematography, creating a tense, action sequence. Working with a solid pipeline of gathering research, storyboarding and animatic creation allowed me to prepare, and make the process of animation as smooth as possible. Using a couple of body mechanics rigs created by Joe Daniels allowed me to focus solely on the animation, which was created in Autodesk Maya with the help of Keyframe MP to analyse the animatic and reference footage.



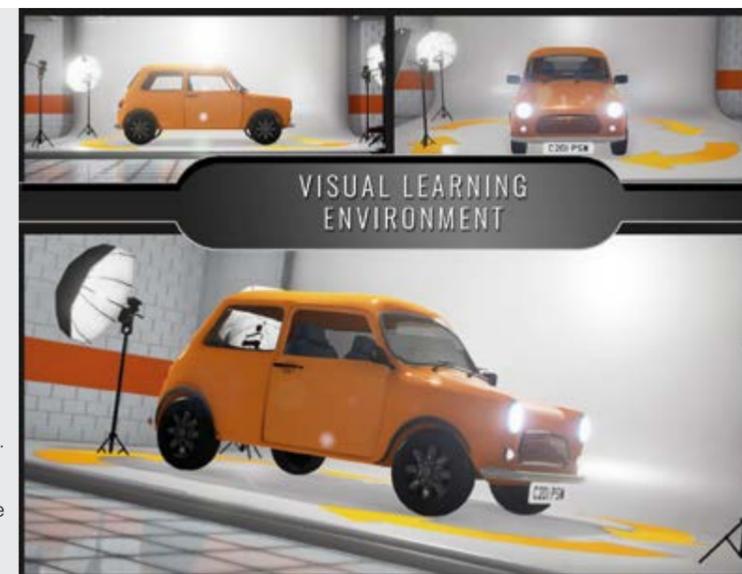
### Jake Belgian 'Memorize' – Remember Me environment production in Unreal Engine 4

I've created an environment in Unreal Engine 4 inspired by concept art from the *Remember Me* game, building on the established setting of futuristic Paris, 2084. I built the scene with current-gen systems and performance in mind, keeping my assets organised, modular and game-ready. I investigated techniques for producing visual effects to push the scene from a static environment to something with movement and depth. The project was mostly textured using an entirely procedural workflow in Substance Designer – in keeping with emergent industry trends, and modelled in 3ds Max. Software such as Quixel Suite 2.0 and Mudbox was important to the workflow of this project and instrumental in the development of my pipeline for producing content for the module. I used research on video-game industry practices to inform my choices in asset creation.



### Jim Burdge Creating a visual learning environment

I've created a product visualiser which informs and educates the user about a topic, subject or object. I'm displaying a classic 1986 Austin Mini in a 3D environment. My visualiser pans the camera into specific positions and triggers animations on the car – it helps the viewer understand exactly what is being taught. I based my model on my own Austin Mini for added realism, taking inspiration from *Need for Speed's* modelling workflow which uses FrogTape, photography and efficient re-topology techniques to form the topology of a car. This process makes understanding the angles and curves of the bodywork easier. The concept of my project can be reused in industries such as retail, architecture, landscape development and product analysis. The knowledge I've gained from this project has fuelled my motivation to push the limits of my workflow, using Maxscript and C++ to bridge the gap between 3ds Max and Unreal Engine 4 by developing automated exports and imports for both pieces of software.



### Sian Butcher The Addams family mansion: a recreation of the interior

I recreated an interior section of the Addams family mansion inspired by the 1991 film in Unreal Engine 4. I aimed to achieve an output comparable to the quality of realistic environments in current generation AAA games. It was important to me that my recreations remained faithful to the tone, style and spirit of the original film, while also paying homage to previous incarnations of the family in earlier works. This project advanced my abilities as an environment artist and expanded my creative toolset. I also developed my understanding of high to low polygon modelling, physical based texturing and material creation, and lighting environments for games and visual storytelling through environment. To create my environment I used Autodesk 3ds Max, Mudbox, Adobe Photoshop, Quixel Suite 2, Unreal Engine 4, Substance Designer 5 and Substance Painter.





### Pedro Camarinha Realistic monster sculpt – Barroth

I've created a game-ready creature asset produced in a realistic art style. The creature is based on an alternate design of Barroth from the *Monster Hunter* series, the design of which was found in the art book, *Monster Hunter Illustrations 2*.

I used the production of this asset to learn how to use Zbrush effectively, as well as to develop efficient production pipelines and improve my artistic abilities. I chose Zbrush due to its popularity in the industry. Many professionals use this software as part of their production pipeline and by learning Zbrush, I hoped to understand why, whilst improving my own workflows. I learnt a number of workflows in Zbrush as well coming to understand its capabilities.

The artistic abilities I improved include interpreting concept art and developing it into a 3D visualisation, sculpting primary, secondary and tertiary forms, texturing in a realistic art style, re-topologising a model to have efficient and animation-ready topology, and compositing render passes for promotional artwork.



### Luke Darby Agamemnon Rising: a recreation of *The Order: 1886*

I am showcasing an Unreal Engine 4 interior game environment, based on a scene from the PlayStation 4 game, *The Order: 1886*. As *The Order* is so heavily set in realism in its artwork I emulated this in my project. As well as researching the game, I researched real Victorian environments and objects, current industry practices, new engine technology and new software. This project helped to develop my skills in multiple areas including digital sculpting, high polygon modelling, physically based rendering and procedural material creation.

This was a great chance for me to attempt something much larger in scale and scope than what I was used to, providing a perfect learning opportunity.



### Ellie Eady Night Vale radio: a 3D environment

*Welcome to Night Vale* is a podcast presented as a radio show for the fictional town of Night Vale, where strange occurrences are the norm and conspiracy theories are part of everyday life. I've taken this purely audio driven story and created a 3D environment that explores the themes, narrative and aesthetic of Night Vale. I created the radio studio within which the main character, Cecil, narrates the broadcast.

To gather reference material, I visited BBC Radio Tees and took photos. After creating concept art to work from, I built all of my assets in 3ds Max and textured them using a physically based rendering metal-like/roughness workflow in Photoshop. The final scene is lit and rendered within the Unreal 4 Engine. I also created a 'making of' book that includes concept art and graphic design.



### Hermes Escriva Serra Integrating characters into a scene

I have developed two fictional characters, one based on a humanoid reptile – a huge, alien-like creature. I've created my own designs of the characters and introduced them to a diorama to recreate a complete battle scene for a possible game.

I used concept art, sculpting, 3D modelling and rendering to create a character that reaches the level of detail seen in games such as *Mass Effect*. I chose this project to improve and showcase my skills as a character artist. I also improved my anatomy knowledge, and my abilities in new tools and software to aid my understanding of different types of characters and creatures.

I used Photoshop CC for the concept art. Pixologic Zbrush 4R7 for sculpting. 3ds Max for re-topology, rigging and posing. Substance Painter for texturing, and for rendering the diorama I used Unreal Engine 4 and Marmoset Toolbag 2.



### Scarlet Emrys Fox The art of anamnesis

Anamnesis is a concept art book for a theoretical action role playing game taking place in the minds of an array of characters. It focuses on the character of Molly, a 16-year-old with dissociative identity disorder, and her quest to return the missing memories of her friends. Molly discovers her own hidden past with the help of her elemental abilities, alternate personalities, and copious amounts of coffee. It was fun to overturn the archetype of this disorder and develop a strong hero, who also happens to be mentally ill.

I developed my skills in digital painting, anatomy, perspective, colour theory, environment, and character and asset design. I used Photoshop and Corel Painter to develop my hand drawn thumbnails and my skills in 3ds Max to support the environment pieces. I used a capture card to record my process for the final illustrations and worked with a sound designer to create an original score.

I've wanted to do this project since I was eleven years old and now I've finally made my dream a reality.

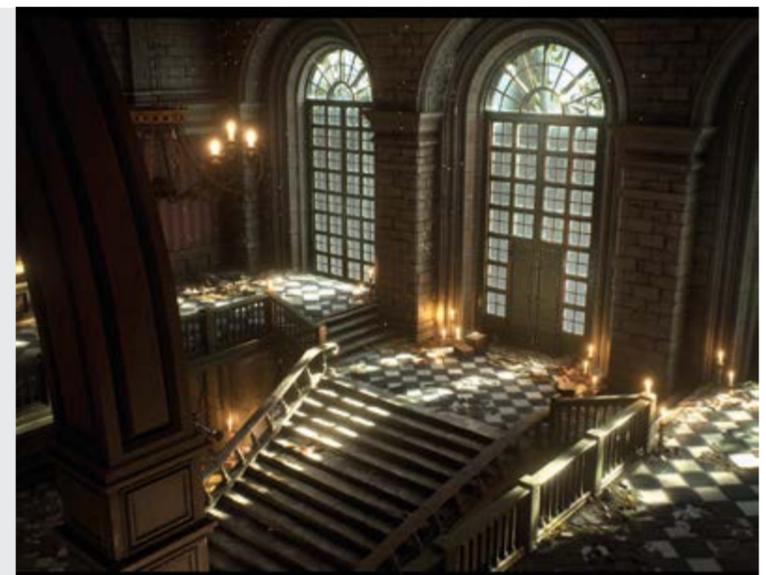


### David Garrett Abandoned manor: Unreal Engine 4 environment

I am showcasing an Unreal Engine 4 environment set in an abandoned manor. My work is based on concept art by Jordan Grimmer.

I've developed a realistic style, taking inspiration from games such as *Gears of War* and *The Last of Us*. I used the latest industry practices and tools including physically based rendering, substance designer texturing and digital sculpting in Zbrush.

The project was a good opportunity to try something larger in scale and more ambitious than any of my previous projects. My piece incorporates intricate architectural details combined with the wear and deterioration expected of abandoned environments.





**Dan Johnson**  
**Paraxenosuchus**

I designed the concept art and a 3D model of a fictional prehistoric creature. This creature is a mixture of two different prehistoric animals – the spinosaurus and the mosasaur. I researched the anatomy of both creatures and combined them to create a new and interesting creature. Throughout this project I have learnt new pipelines and methods of 3D modelling and sculpting, as well as advancing my knowledge and skills in drawing for concept art.



**Isak Kjolen**  
**Daenerys Tent**

I have created a set from the TV show Game of Thrones, in season 3, episode 7. It's the inside of Daenerys tent. With no humans, but with all three dragons, rigged and animated with a long looping animation. I have aimed for photorealism in this project. The camera is only able to move inside the tent, and there's a one minute long cinematic when the level loads. To make it photorealistic, I had to learn more about the material editor in UE4. I learned how to use subsurface scattering for the dragon skin. I also learned how to make subsurface scattering maps for optimal effect. When sculpting the dragons, I used HD Geometry for the first time, and put in as much detail as I had time for.



**Jile Li**  
**Concept art book of Hansel and Gretel**

I have produced a concept art book for my final year project. I created all environments, characters, weapons and vehicle designs in the art book, focusing on my skills in digital painting and traditional drawing. My piece is based on the Grimms' Fairy Tale, *Hansel and Gretel*. I've used this original tale and developed my own art direction for the story. I did not plan to design characters, weapons or environments based on the original story's setting and design, instead I changed the background of the story and made a sci-fi style of artwork. The idea was based on cyberpunk.



**Miguel Angel Pescador Colomar**  
**Lost Boy: a character based on the world created by Ash Thorp**

I developed a full in-game character based on the *Lost Boy* universe created by Ash Thorp. The design was defined by the several illustrations that the artist published about his work. The purpose of my project was to produce a 3D model of a character conditioned by actual video game industry requirements, achieving the best look possible without wasting resources. I also wanted to showcase my skills as a 3D character artist. My workflow involves the development of a high resolution model using Zbrush to project all its detail over a low poly model produced with Autodesk 3ds Max. For the texturing process I used Substance Painter, software that has become standard in recent years, and one I had never used before. The challenging part of this project was working with different approaches such as organic and hard surfaces, becoming proficient with already known programmes and learning new tools.



**Stewart Pirie**  
**Pilots Respite: a Star Citizen inspired environment**

This project showcases the creation of a current generation 3D environment inspired by a piece of concept art by Corentin Chevanne. Using current generation industry tools, such as the Substance and Quixel Suite, alongside Unreal Engine 4, I implemented current generation practices such as physically based rendering. I aimed to showcase my ability to work from another artist's piece whilst iterating and performing my own design choices based on my artistic and technical knowledge. From a personal perspective, this project has given me opportunity to focus on a small scale environment in a style outside my comfort zone.



**Paula Sanchis Oviedo**  
**Medusa and Perseus**

My exhibit consists of two characters from Greek mythology, Perseus and Medusa. I fully adapted and rigged my characters for a video game, posing them to recreate a beautiful Greek scene with a quotidian touch. I set up my scene with a cartoonish style to portray a less merciless and cruel world as would be created by realism. I created my scene in a fantasy style world that almost romanticises the period alongside the strong and dynamic characters. The purpose of this project was to improve my sculpting, modelling and rigging skills, preparing for the industry. To develop that, I used Zbrush to sculpt the high poly models, 3ds Max for re-topologies and rigging, Marmoset Toolbag for the final renders, and Photoshop for post-production.





### Saifur Siddique

#### **Metal Gear Solid: Raiden character sculpt**

To stand out as a 3D character artist you must create great looking sculpts and be able to make proficient game-ready models to put into a game engine. To illustrate my potential in this field I recreated an iconic character from the gaming universe.

I have sculpted Raiden from the *Metal Gear* franchise. I worked on making a high resolution sculpt for beauty shots and physically based renders as well as a low poly, game-ready model.

I chose to sculpt Raiden as he is a mixture of organic and hard surface sculpting. His armour has an overall shape of the human muscle structure along with elements of hard surface sci-fi equipment.

I used Zbrush for my sculpting process, 3D coat to re-topologise and substance painter to texture the model.

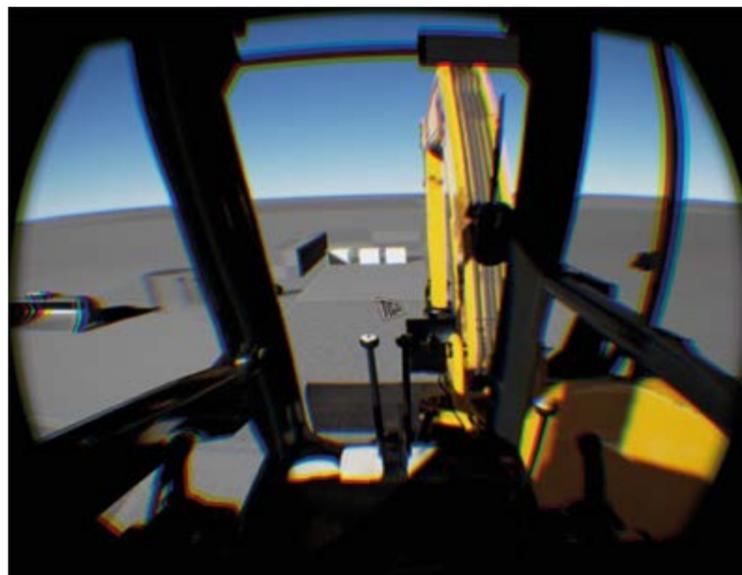


### Matthew Daniel Slaymaker

#### **1979 BMW M1 Procar**

For my final year project I had decided to create a 1979 BMW M1 Procar. My reason behind this is because I have a passion for cars.

I choose this car for two reasons: the first being that I needed a simple looking car for it was my first time modelling a car and the second is because I wanted to retain challenge so I decided on the racing version, it was difficult and fun, in this project I had decided to model exterior and the interior of the car.



### Tom Smith

#### **Excavator simulator 2016**

I researched, modelled and textured a (JCB) 8080 excavator. I chose this project as I was using one at work on my uncle's farm and it inspired me.

I skinned and rigged the JCB for use in Unreal Engine 4, and I have an Oculus Rift plug-in to allow a player to view in first person, and move the excavator using a controller.

As an artist I knew this project would be very challenging and ambitious. It developed my skills in material creation, high and low polygon modelling, physically based rendering/texturing, reference gathering, rigging, skinning, animating, and setting up a vehicle/character for use in Unreal Engine 4 using clever plug-ins to help. I researched the 8080 excavator and how it moved and looked – the fact I had access to a real one meant I had lots of reference material.

My project was created with a next generation pipeline and a suite of tools including Unreal Engine 4, Substance Painter, Oculus Rift, Quixel Suite 2, 3ds Max 2016 and Photoshop.



### Joe Tyas

#### **Gears of War: Abandoned Beauty**

A battle-worn, well-trodden environment captures the story of an overgrown courtyard, once inhabited. Based on a concept by Jon Liberto, recreated in Unreal Engine 4, Abandoned Beauty is a 3D environment piece which takes the original concept and re-imagines it in a derelict state. The project showcases a vast amount of sculpted architectural works, produced in ZBrush and 3ds Max. Using a physical based rendering pipeline, the low-poly versions were textured using programmes such as xNormal, Substance Designer and Quixel Suite 2.



### Jaz Kendall Vassie

#### **Real world adaption to a sphinx**

When playing games, I have often noticed how ill-fitting many of the creatures are in relation to their environment, especially in fantasy games. Thus, for my final year project I wanted to create a creature that would appear as if it belonged in its environment, ensuring the suspension of disbelief remains intact. I took an existing mythical creature – a sphinx – and adapted it to life in a cave biome from our world, as if it had evolved there alongside real life fauna and flora. I have had an interest in biology and geography for a number of years, so the chance to use them in a project with my degree was very exciting. I made a number of conceptual art pieces, a 3D model, and an additional mascot character in the form of a bat. As well as this, I rigged and skinned the model myself.



### Jack Marcus Warren

#### **A concept brought to life in Unreal Engine 4: Planet of The Apes environment**

Using concept artwork from the film, *Rise of The Planet of The Apes* I created an immersive 3D playable environment in Unreal Engine 4. One of my aims was to create an environment that would tell the story for itself. To do this I created and placed assets in ways that explain where the player is, who the character is and the history of the character. Through my project I gained valuable skills in modelling, texturing, optimisation, lighting, rendering, software, and project management. To create and texture my assets I used Autodesk 3ds Max, Photoshop, Quixel 2 and xNormal.



Jordan Conlin - Final Year Project  
Anubis

### Jordan Conlin Egyptian gods

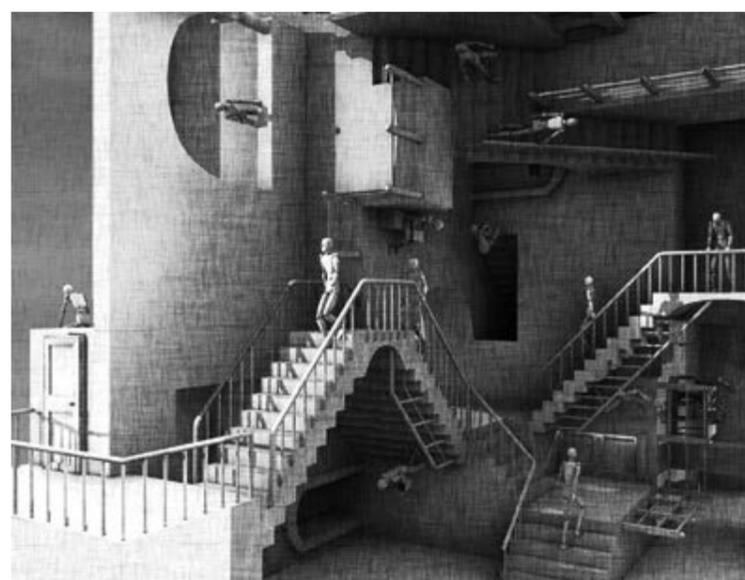
My project goal was to create four distinct characters of an Egyptian god theme that were game-ready. Originally I set out to create two, Anubis and Sobek, (the Jackal and Crocodile gods) but this roster extended to include Bastet and Ra, (the Cat and Bird gods) respectively. Three of my characters are fully textured and re-topologised with real-time rendering in mind. Ra stands out as high poly sculpt for pre-render purposes.



### Bethany Freckleton An Unreal Engine 4 remaster of Sam's bedroom from the Indie game, *Gone Home*

Implementing Unreal Engine 4 and other tools, I remastered and recreated Sam's bedroom from the indie game, *Gone Home*, into a 3D environment. My aim was to overhaul the existing cartoon game art style to a next-gen, high-level, realistic scene, injecting a sense of life and the habitation of the main character in the 3D space.

The project developed my skills in lighting, physically based texturing, use of in-game engine skills, developing a personal reference library and high to low poly modelling. I researched interior design styles from the 80/90s, used the game as reference throughout and studied the use of environmental storytelling. I used Autodesk 3ds Max, Adobe Photoshop, xNormal, Quixel NDO, Substance Painter, Substance Designer 5 and Marvellous Designer 5 for the creation of my assets. Finally presenting my 3D game environment in Unreal Engine 4.



### Jacob William Gristwood Recreating Relativity

While at Teesside University I have experimented with a wide variety of 3D art styles. However, one artist I have always been fascinated by is M C Escher.

Over the course of this project, I aimed to recreate Escher's well known lithograph print *Relativity*. My hope was to create a real-time 3D environment in Unreal Engine 4, rendered with a cross-hatch post-processing shader that would emulate the art style of Escher's drawing. I used Autodesk 3ds Max, Photoshop and Unreal Engine 4 for this scene.



### Miguel Arroyo Achieving industry quality using UE4

In the video game industry aesthetics and artistic quality are just as important a good technical quality in order to create breath-taking environments and memorable characters. Through the making of this character and environment I did my best to get as close as possible to industry quality Triple A fidelity level. Using my artistic skills and researching about different techniques and tools inside the engine in order to enhance them I have created a vivid scene running in real time using all the tools and techniques I have been able to research and use.



### Joshua Brook 3:33

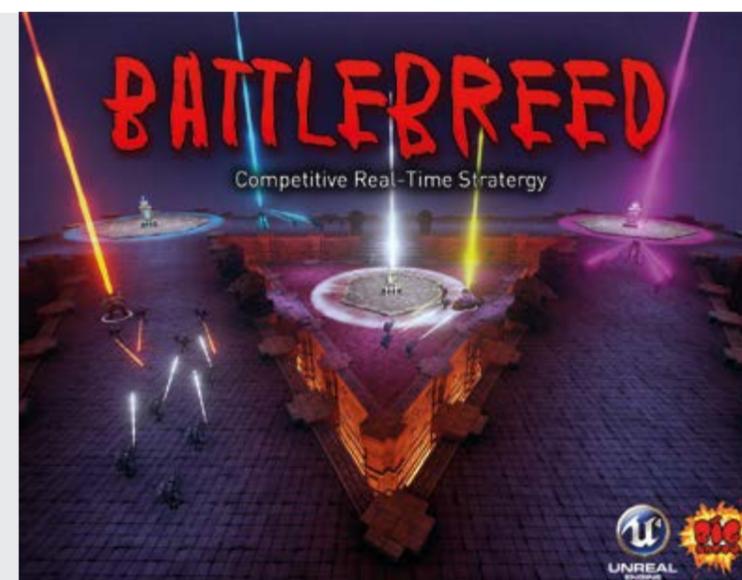
3:33 is a short first person time travel mystery exploration game. With focus on level building and storytelling. The project is heavily inspired by works from Bandon Chung, Steve Gaynor and Jordan Mechner.



### Jack David Daniel Fletcher Battlebreed

For my final year project I wanted to combine fast paced competitive gaming with elements from Real-Time Strategy (RTS) games. The prototype I've developed is a real time strategy game with fast paced gameplay designed using levels and mechanics inspired by the current trends in ESports and competitive games.

The project is a fully playable prototype with an accompanying design document. The focus is on game design, level design and scripting as these are the areas I am most passionate about, however the project demonstrates a range of skills beyond those mentioned.





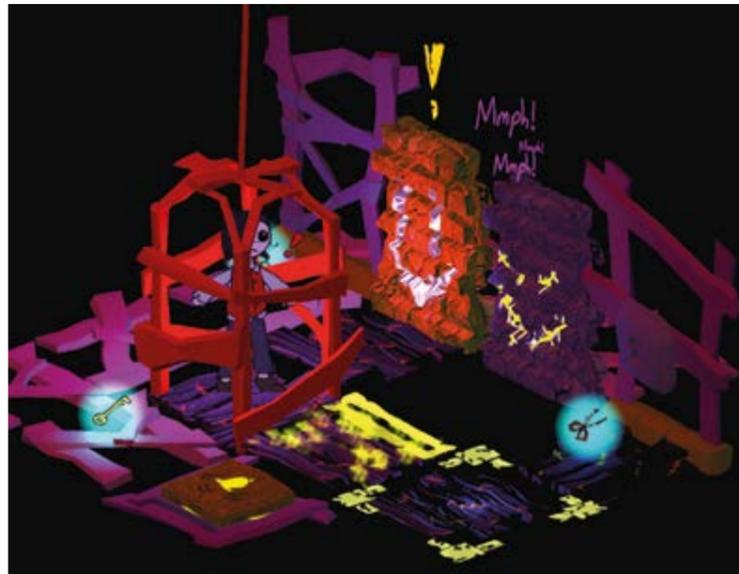
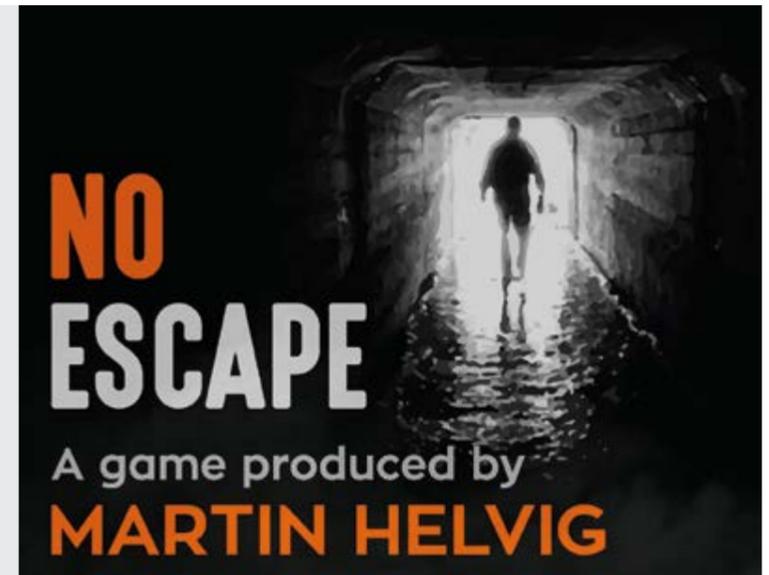
### Daniel Gunn The Hunt - A VR experience

The Hunt is a virtual reality experience. It's a single, story based level, which will test your survival skills, putting you inches from the jaws of an enraged T-Rex all in a lifelike virtual reality. You will need to act fast and make the right decisions to stay alive and escape to safety. The level is a modification for the ARK: Survival Evolved game which is built in the Unreal Engine 4. The game is presented on an Oculus Rift Development Kit 2. As a side project, I will also have a mobile version of a game I have been working on outside University called The Mimic. It's a platformer puzzle game, which boasts unique innovative mechanics and gameplay. I'm planning on releasing The Mimic on the Google Play App store soon.



### Martin Nordin Helvig No Escape

As the only survivor in a car crash, you find yourself trapped in a collapsed highway tunnel. No Escape is a first-person escape game, where you find items and use them to your advantage to escape your worst nightmare. I have been working on this for around five months, and the goal for me was to create a memorable game with varied gameplay. For me it was important to show my strength as a game designer by doing everything from creating assets to building the level. I mainly used 3ds Max, Unreal Engine 4 and Photoshop. I did most of this myself to learn the whole process of creating a game, which has given me a better perspective on each role in a game project. It was still important for me to focus on the gameplay and making mechanics work for the player. And with my early test versions of my game, I have received feedback which helped me evolve the game to a point I feel proud to present it.



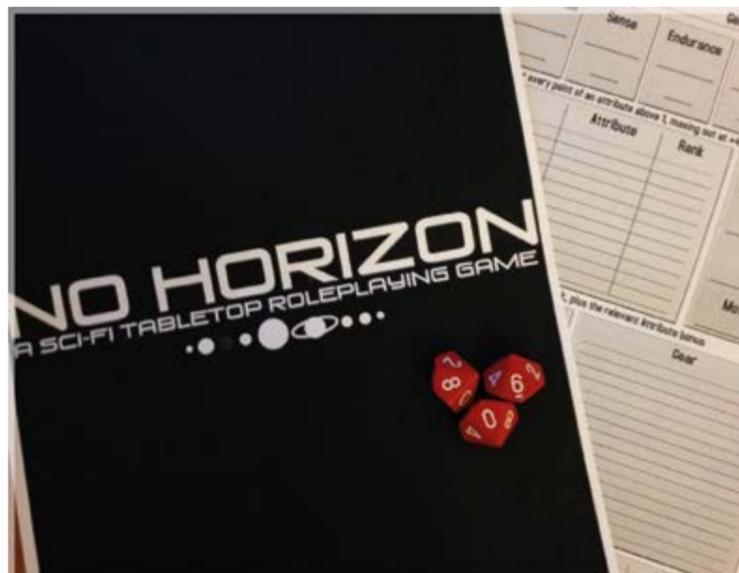
### Kjersti Kristensen Stitched In

I have always enjoyed designing rules and stories, and this is why I chose to create Stitched In for my final-year project. The reason for this is that it allowed me to build and work from my own concept without making the technical side too complicated. My goal was to develop skills within Unity and learn the coding logic to get the functions I wanted, and I decided that doing so from my own design was the best way to go about it. Stitched In is a tile-based puzzle-game made up by different tiles, walls and items that together make up the puzzle aspects in the game. Once I had successfully built all the core mechanics, my design allowed me to build and make changes to the levels quickly and easily. The story centers Klora; a young girl trying to escape from the strange house she wakes up in, while gradually learning the truth of where and who she is. I used 3DS Max to create my own 3D assets, Photoshop for 2D assets, and the visual coding package Playmaker in Unity to do the coding.



### Josh Wall Metanoia (game demo)

I will be showcasing my final project, which is a first person demo that will focus primarily on character customisation. The main elements I plan to show off are my ability to use blueprints in the Unreal Engine 4 and my level production and design skills. In addition to this I may also be showcasing other work done as a part of this year and last year, although the main focus will be my final project.



### Aaron Lomas No Horizon: A tabletop RPG

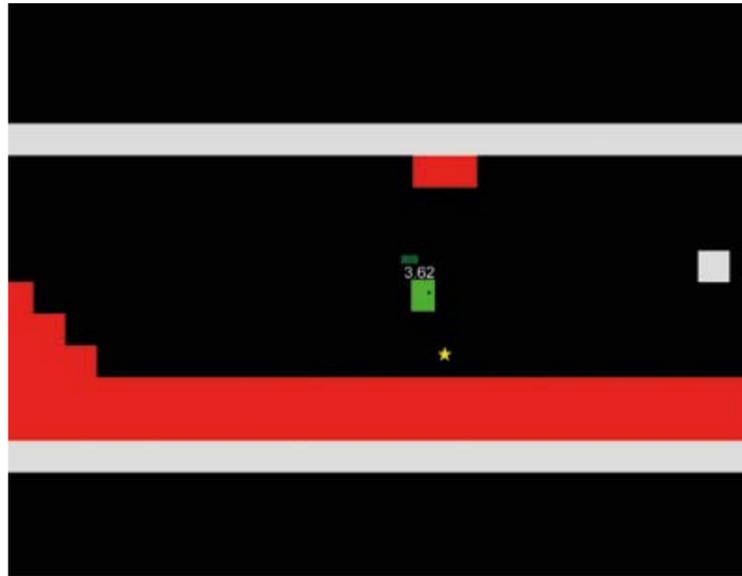
I've always felt good design should be able to stand on its own, without cloaking itself in artwork and music. For my project I took it upon myself to explore that, and to that end created No Horizon, a sci-fi tabletop role-playing game for two or more players. Pitting a group of players against a fierce universe, governed by the Games Master, No Horizon is a powerful example of games and narrative design, and how they can stand on their own - fuelled by the creative energy of their players.



### Jack Chapman Asylum - gameplay prototype

Asylum is a first person adventure game, with heavy emphasis on stealth, platforming and exploration. I wanted to create it as a proof of concept for a full game that would be viable as intellectual property, while also showcasing my talents as a designer and a producer. The player will explore, traverse and interact with a harsh yet intriguing game world, making it a fairly slow paced experience, with the game's narrative and player exploration being the main driving force. This is backed up with a stellar voice cast including an actor who featured in *The Dark Knight Rises*, and an original soundtrack that has been composed by several musicians especially for the project. I have utilised every available asset pack that Epic Games released to help achieve my vision and make good use of the great development community through Unreal Forums. Adobe Photoshop and After Effects were also used for marketing materials and introduction videos for the project.





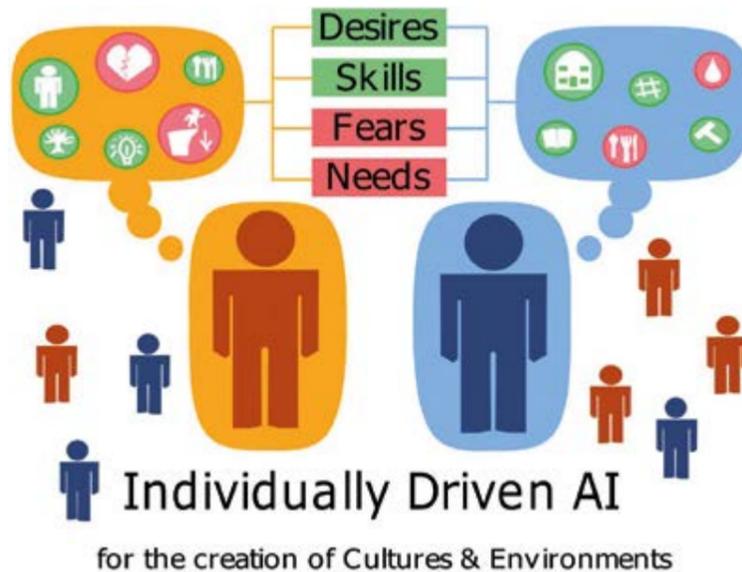
### Lewis Smith Speedrunning

My final year project revolved around the creation of a 2D platformer designed to appeal primarily to the speedrunning community while remaining accessible to a broad audience. I had to ensure the game was simple enough to learn but hard to master.

The development process involved me designing and creating 30 playable levels which steadily increase in difficulty and introduce the player to a variety of level mechanics throughout the whole game to make it diverse. I was required to ensure that the level completion rewards were balanced appropriately in relation to its difficulty as well as the stage unlocking progress system, and as a result, the game had to be play tested frequently to acquire data, which I then had to thoroughly analyse.

I have implemented multi-player up to five players, which has been a feature enjoyed at events such as GameBox and Game Bridge.

BSc (Hons) Computer Games Programming



### Samuel Ballard-Adams Individual agent driven culture and environment development

I have developed a system for the creation, expansion and alteration of realistic cultures and environments in a fantasy virtual world. The system is driven by individual agents' needs, desires and abilities.

Following chaos theory: small details – like one agent's fear of heights – could change the shape of a city from lining a cliff-side to heading further inland. Such small details are tracked across hundreds of thousands of individual agents, each with different cultures having different driving forces.

The system has been developed using the C++ language using the C++11 standard and SFML libraries and is targeted at Windows and Linux platforms.



### Jason Clark DEJASE – Dedicated engine of Java for academic secondary education

I produced DEJASE, a cross platform reusable game framework with rendering, simple physics simulation and sound capabilities needed for a game world. This can be experimented with using a few lines of code.

My project's purpose was to develop an educational tool that could be used instead of Visual Programming Languages like Scratch or Alice in private study, controlled assessment or practical investigation. This was intended to help hands-on code development and see game world visualisation changes with new code additions in one file.

The engine parts were written in Java using a LWJGL backbone using Eclipse. The framework can be built and run via Eclipse by the students themselves. I've explored and reinforced many areas like project management, agile snapshot methodology management, class design, 3D graphics (multi-pass forward rendering), physics implementations and sound processing.



### Jordan Davidson SpineAR mobile app for physiotherapy students

After completing my industrial placement at Schlumberger, I took the opportunity to work on another real project with a client, producing the iPad application SpineAR.

Aimed at students studying physiotherapy modules, it is a learning tool that uses QR markers to display 3D models and animations in an Augmented Reality environment. The main goal of my project was to replace the use of QR markers with the structure sensor, a cutting-edge depth sensor for mobile devices, to perform real-time tracking of a person's back and overlay a 3D model of a spine that animates in relation to the person bending forwards and backwards.

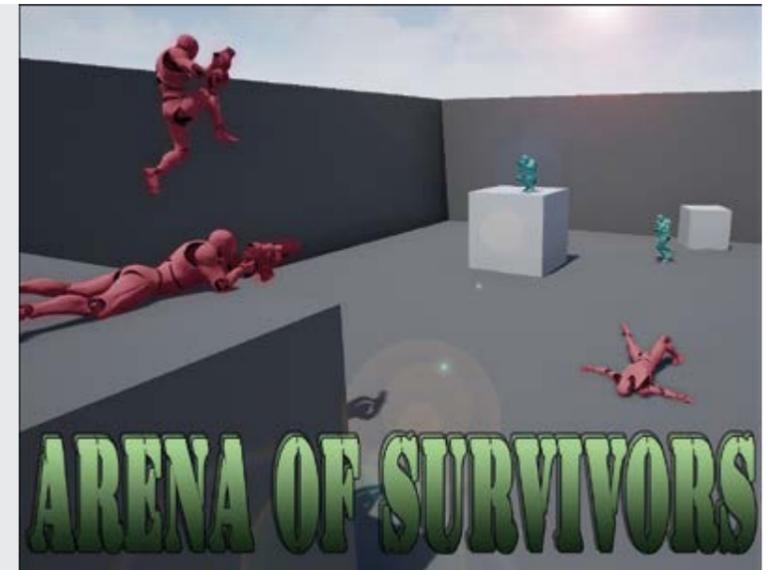
SpineAR has also been ported to Windows and Mac OS X with a user interface that works across all platforms, allowing students to use the app outside of their practical sessions. I have further improved my knowledge of C# and Unity and developed new skills working with Augmented Reality, depth sensing, iOS development and the Agile development methodology.



### Nacho Talens Multiplayer battle arena video game

The video game industry keeps growing year after year, and with it, the requirements to be at the top of it. Knowing that I want my area of expertise to be gameplay programming, I decided to develop a multiplayer video game from the scratch, focusing on the gameplay networking discipline.

I decided to use Unreal Engine 4 to develop this project, not only because it allows me to focus on the gameplay networking discipline, but also because it uses C++, the current standard language of the industry. The genre I chose for the video game is the First Person Shooter.



### Lucy Keel 2D Physics

There is a growing amount of evidence that suggests that, contrary to popular belief, video games can help with learning. My project aims to give players the opportunity to learn fundamental physics and mechanics concepts while playing a game that hopefully retains the perceptual training features of a first person shooter, but without the violence.

The project consists of a number of mini games that cover topics such as projectile motion, gravity and friction. Using Visual studio 2013, the project is written in C++ using SFML 2.3.2 and Tiled map editor.





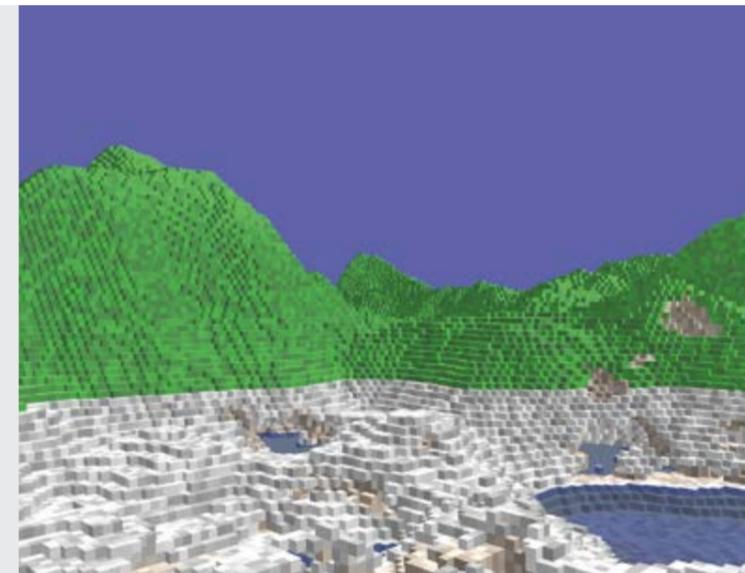
### Opeoluwa Ladeinde Dynamic path finding AI for 2D platformers

I am exhibiting both an interactive variant of my AI system, which is designed to be a class system to work for any layout, and a prototype of a game developed to go alongside it. Through these projects, I've drastically improved in my abilities in creating user interfaces. I've improved both in the efficiency of the functionality I can provide for them, as well as how easily I can make systems usable between projects. I've also developed my skills in file arrangement and improved how I plan my work.



### Aaron Preece Infinite voxel worlds

Using voxels to represent terrain in the games industry is becoming more and more common. As hardware becomes more advanced it becomes easier to create huge and incredibly detailed terrain. Although due to hardware limitations infinite terrain is theoretically impossible, my project aims to create a voxel world that is large enough to appear infinite to the user. I've also looked into creating similar features seen in real terrain such as caves, trees and water. The project was created in C++ utilizing OpenGL.



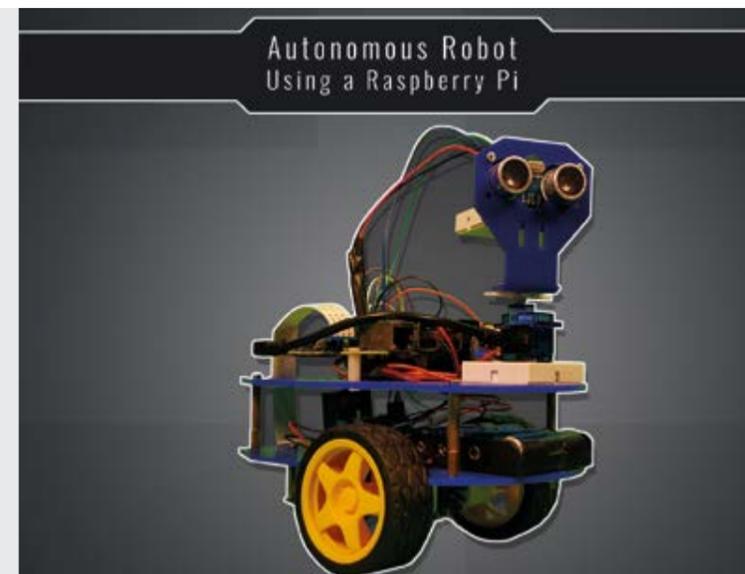
### Carlos Martinez Romero Procedural city rendering with new generation graphics APIs

Mantle, DirectX 12 and Vulkan, set a new standard for graphics programming. These APIs reduce driver overhead and vendor variance by simplifying the drivers. To the developer this means direct GPU control and a less vendor specific code, plus multithreading support. I have created a C++ application that can render with DirectX12 and Vulkan, a modular system that allows me to access both APIs from my application. To make sure I utilise all of the processing power, I created a dense environment and focused on having systems capable of streaming massive amounts of data in real-time. To maintain a stable framerate while streaming data I distribute the workload among different threads and access the GPU in parallel. Drawing the scene is done with a single draw call, and I created a geometry pool that I update in between draw calls by removing and adding geometries. To texture all buildings with limited VRAM I created a texture manager with a priority system that is capable of streaming textures in different threads.



### Daniel Quirke Building an autonomous vehicle using a Raspberry Pi

Autonomous vehicles are becoming closer to being a reality and I want to be a part of it. I have applied for a master's in California to study intelligent robotics or computer science, this project was a great step in that direction. I have researched and purchased everything for my robot so I could build it from scratch. On top of this I have made it autonomous with the ability to solve a line-based maze. With more time, there are sensors on the robot which could be used for object detection and avoidance.



### Juan Antonio Pardo Robles Procedural content generation oriented on gameplay features

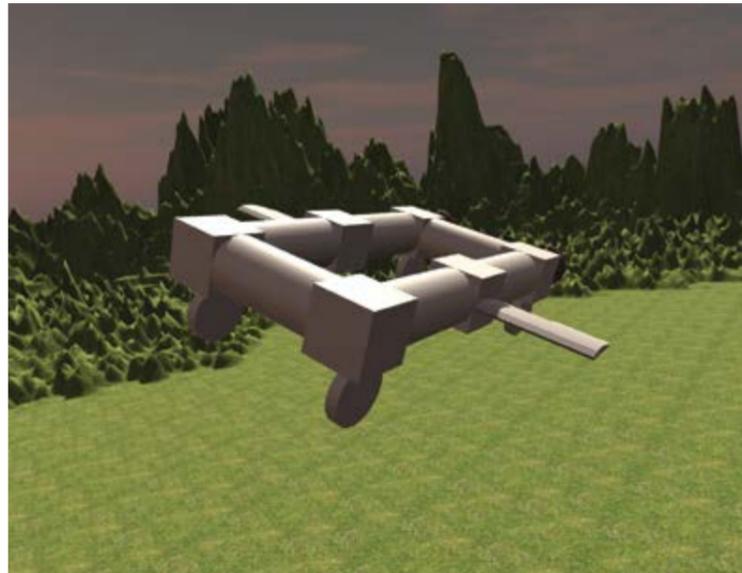
Galactica is the name of a 2.5D spaceship side-scroller game with dynamic difficulty that adapts to the skill level of the player in real-time. The game can be played in different platforms such as Windows, Mac, Android and iPhone. Several Artificial Intelligence (AI) systems have been implemented, including Finite State Machines, a Multi-Agent System and Pathfinding. The project has been developed in C++, the framework Cocos2d-X, and using Visual Studio 2013.



### Cesar Ramirez Fernandez Apple Watch health application

I have developed a health application for the Apple Watch, the new smartwatch developed by Apple. The application is focused on improving the health of the user by applying game mechanics and game design techniques to motivate people to achieve their goals. The user has to create a character and complete different tasks to improve his characteristics. I have used all the features in the device, such as the 3D touch to detect different pressures in the touch screen, the accelerometer and the heart rate sensor. To program the application I used Swift 2, Apple's programming language and other tools such as WatchKit, HealthKit and SpriteKit.





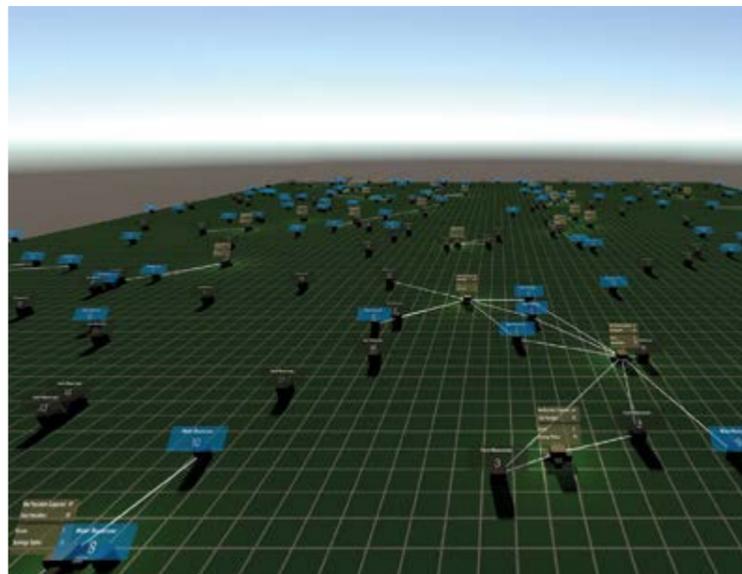
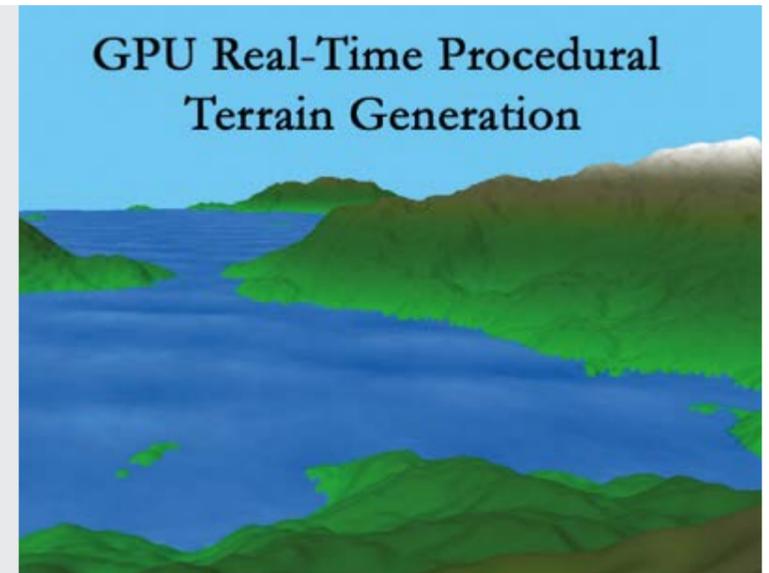
### Alexander Conor Ramsay-Baggs Modular vehicle building system

Using the Unity Engine and C#, I have created a system for building land and air vehicles from modules, which the player can piece together in any way they like. These vehicles can then be placed into an accurate physics simulation where players can fly and drive them. The systems behind vehicle creation and simulation were designed to be easily expanded, allowing players to create new modules with unique functionality.



### Tomy Bielen GPU Real-Time Procedural Terrain Generation

My aim was to research techniques regarding real-time procedurally generated terrain. To do this, I have built a framework in c++ which showcases a procedurally generated terrain being built around the user. To make this possible I have used several dependencies, which are OpenGL for communication with the graphics processing unit, SDL to create the window in which the application runs and for communication with low level input, GLM for mathematical functions and structures, and finally ImGui for the user interface. The terrain features a dynamic level of detail through the use of tessellation shaders based on the camera distance. The user is capable of moving around the demo and the GPU builds terrain in whichever direction the user moves, at any speed.



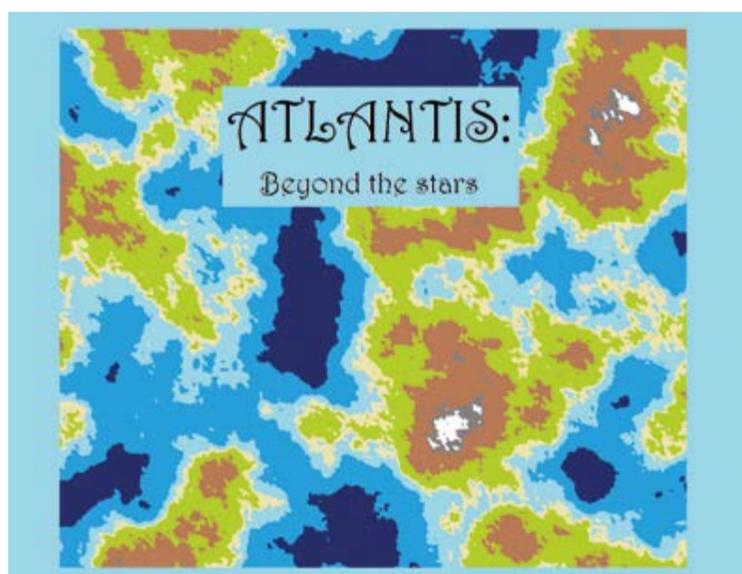
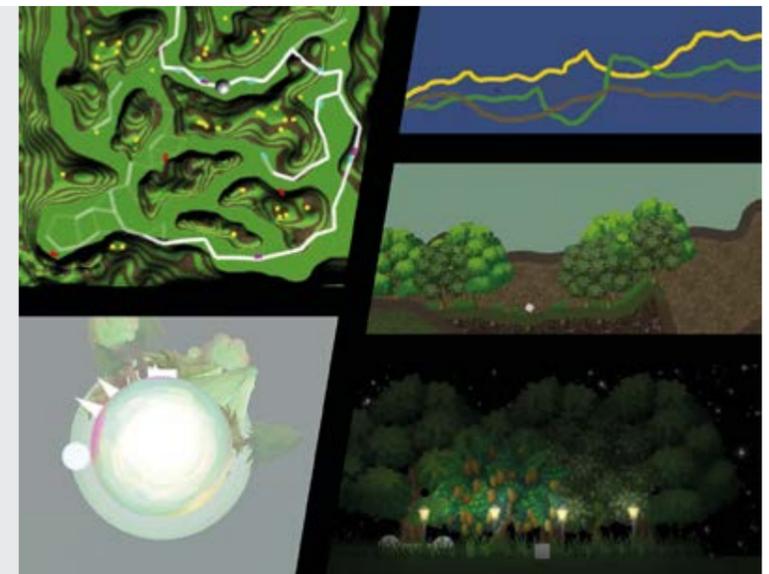
### Martin James Robertson Intelligent settlement populations

I set out to create a simulation of multiple settlement based populations that would manage themselves and be able to decide the optimal action given a certain situation. For example if they did not have enough food or water they would look to move their location to a more lucrative one in order to survive. Each settlement consists of three managers/agents that manage the settlement such as the resources, military and a core manager which makes the overall decisions. The simulation itself was implemented using Unity 5 and C#.



### Alex Liam Wells Simulating super-organism behaviour from independent actors

The work shown is an exploration into Artificial Intelligence. I wanted to create an environment in which emergent behaviour is seen between actors without global parameters. Each actor's memory is built from personal experiences and inter-actor communication. Communication between actors is in two forms: Stigmergy - A trace left in the environment by an action stimulates the performance of a next action by the same / different actor, and on contact - one actor's knowledge can be passed to another. Emergent behaviour is shown as arterial paths being formed as more actors find food along a route and reducing time spent in the exploring state i.e. hoping to find a goal (food). I'm also demonstrating a personal project game that I've been working alongside my studies. The working title "Infinitely comfortable" refers to the world's soft body appearance, and is being designed as a simulation game in which the user controls a microscopic civilisation against the threat of the environment and resources.



### Pablo Sabate Guerrero Artificial Intelligence for a city building game

My project for ExpoTees is about Artificial Intelligence, in a little bit more detail how different AI techniques are implemented together to form a city-building game.



### Danny Wesson Networked shooter with realistic Artificial Intelligence

My interests in Artificial Intelligence (AI) led me to create a networked first person shooter which demonstrates human and AI interaction utilising an atypical Turing test. Each test is voluntary and essentially checks whether participants could identify AI players along with a rationale for their choice. The AI has been designed to exhibit realistic reactive behaviour towards both the environment and players. Most traditional FPS games structure their AI architecture on that of a state machine which is apparently good enough. The networking element provided the best case scenario for attaining reasonably accurate testing results which will show the importance of AI behaviour in modern games. I opted to use Unity 5. Other than the apparent revisions from previous versions, it promotes fast development, ease of use and familiarity. Photon Unity Networking (PUN) assisted on the networked aspect while the overall code has been written in C# version 6.



# WE BET YOU LOVE BRINGING GAME-CHANGING IDEAS TO LIFE.

GRADUATE SOFTWARE,  
TEST & DEVOPS/AUTOMATION  
ENGINEERS | LEEDS

12 Month Fast-Track Programme

At one of Yorkshire's biggest digital employers, you'll be free to run with new ideas and create game-changing products and applications.

You'll grow. You'll be challenged. You'll work with the best digital minds to push the latest tech to its limits and create thrilling online betting and gaming experiences.

The pace is fast. There are no boundaries. And our award-winning team has created a lean and agile environment like no other.

**THE STAKES ARE HIGH - ARE YOU IN?**

Find out more and apply at  
[www.skybetcareers.com/graduates](http://www.skybetcareers.com/graduates)

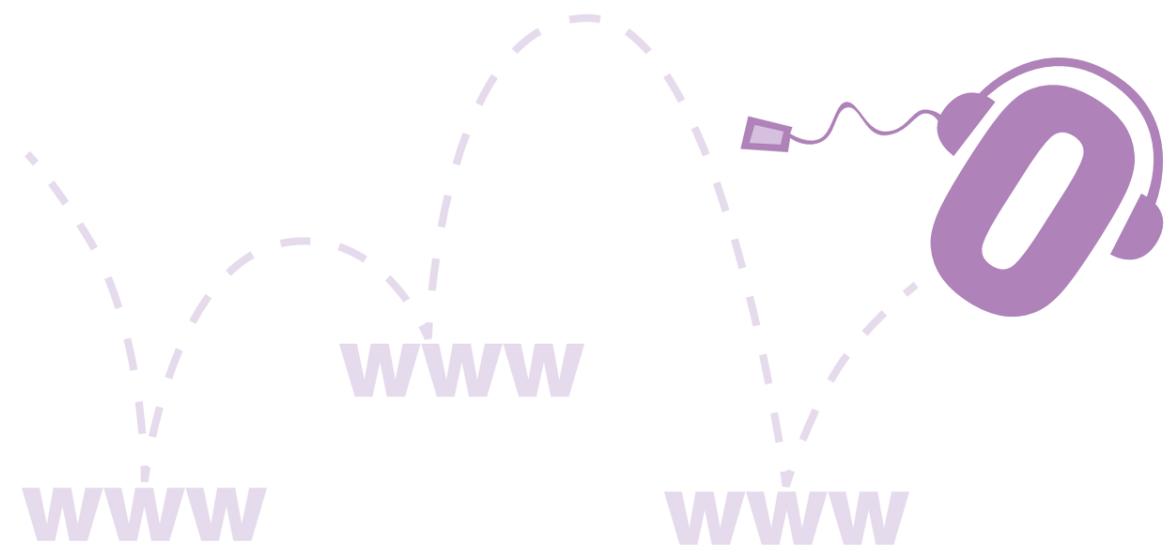
 SPARTA  
GLOBAL

 sky BETTING  
& GAMING



## Digital Media & Web

These projects are wide ranging and cover several disciplines, which share the common theme of using highly engaging visual and audio media to support commerce, business-to-business web services, education, social networking and entertainment. The R&D projects in this section present work that reflects the creative, interactive and technical aspects of website and multimedia development demonstrated using emerging technology and developed for a range of platforms.



Teesside University's School of Computing offers world-class computing facilities, including a wide range of web, multimedia, network and programming studios. Students have 24-hour access to labs and studios during term time, ensuring that we provide one of the UK's best teaching environments.

Undergraduate

- FdSc Web Design
  - BA (Hons) Creative Digital Media
  - BA (Hons) Web and Multimedia
  - BSc (Hons) Digital Media\*
  - BSc (Hons) Digital Strategy Development\*
  - BSc (Hons) Mobile App Development
  - BSc (Hons) Web Production\*
- \*Subject to approval

Graduate Profile

Emily Hilditch BA (Hons) Creative Digital Media

Emily's career path directed by her passions

'The course and the tutors are exceptional, I would have never landed my dream career without them!'

Emily had heard good things about Teesside University, and when she conducted her own research she found that the School of Computing had an excellent reputation.

'I wanted to study creative digital media due to my passion in digital design and my love for online retail. The course was well suited to my future career ambitions. It allowed my creativity to flourish on a diverse range of modules and the tutors were extremely supportive, guiding me throughout my degree.'

'I took a placement year at a digital agency in Newcastle, which was an excellent opportunity. It gave me great insight into working in a digital marketing work environment and developed my creativity and technical skillset.'

'Showcasing all the work I had completed during University at ExpoTees was a very proud moment and an amazing experience. All the students who attended the event had lots of interest from employers. My portfolio received a lot of attention

during the exhibition and I was offered a job by a creative agency.

'My aspiration was to work in e-commerce, so I jumped at the chance to join Sports Direct as a junior web designer when I graduated. From the very beginning I was given diverse projects that pushed my creativity and technical skills.'

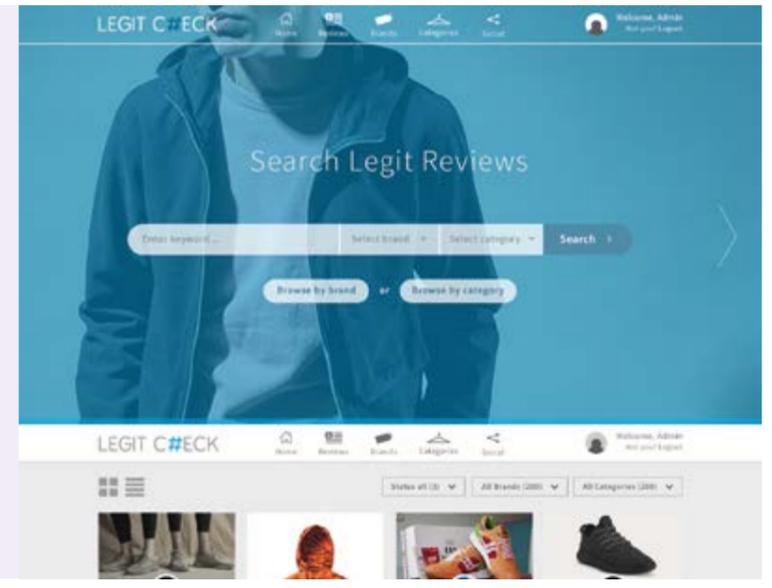
'Now a mid-weight web designer, I am given huge responsibility to improve and maintain our vast growing portfolio of sites. I enjoy the fast paced working environment where I can utilise and enhance my design skills on all aspects of e-commerce. My passion has always been with digital design and aim to progress further in the company.'



BA (Hons) Web and Multimedia

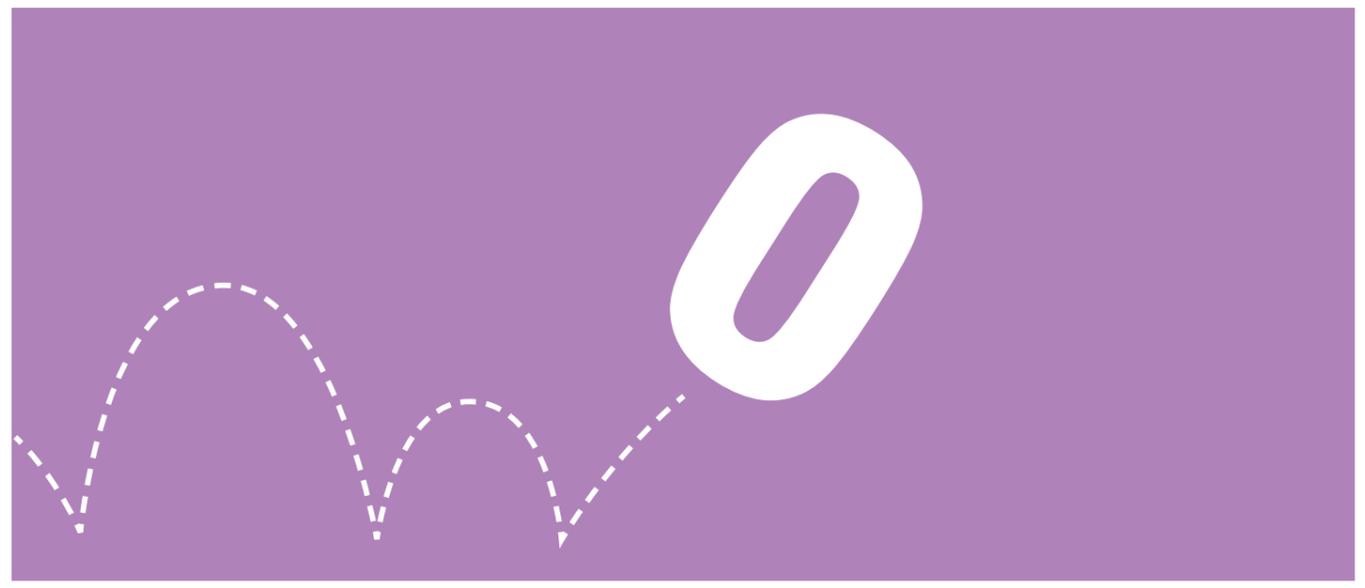
Connor Michael Brough Legit check: Niche fashion review platform

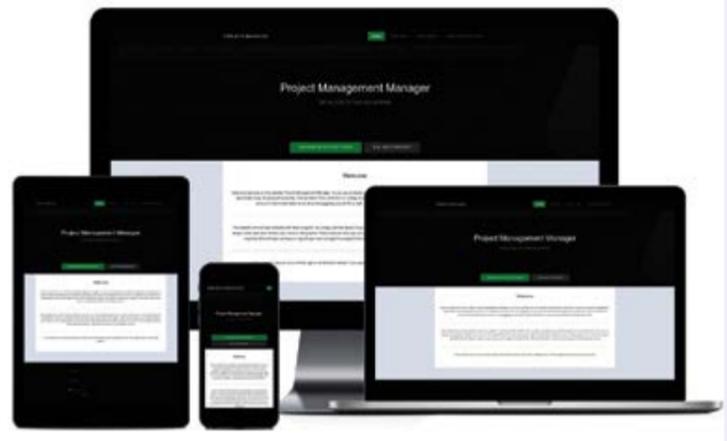
Legit check is a web-based application where users can read reviews on limited edition clothing and trainers. Users will be able to find out more information than is generally available on a retailer's site and see where the item can be purchased from. Links to online stores will be provided beneath each review, in some cases these links will be tracked using an affiliate program that can track where a visitor has come from if they make a purchase from the linked store. Users are able to create an account and login, which will allow them to favourite/save reviews to read later.



Steven Dent FaceStation - Android wear repository site

FaceStation is a new repository/archive of custom android wear watch-faces. It allows users to browse and download watch-faces using detailed filtering and search functions as well as upload their custom watch-faces to their own personal store-front for the rest of the community to download. I used a Wordpress theme called Salient as a base-point for the site layout and adapted a child theme from it to match my site designs. I also wanted to make branding a big part of my project and ultimately spent a lot of time establishing a brand identity that I was happy with. FaceStation is built using WordPress and WooCommerce.





# PROJECT : MANAGED

Let us plan, to help you achieve.



## Jack Austen Griffiths Project management manager

I am showcasing a website that students can use to help assist with their projects. Some students may find the level of university work overwhelming, so this website will help aid them in planning so they can get a better understanding of what they need to do. The users will create an account, and will be prompted to enter the details of their projects. The website will then generate a page that shows the students what they have to do, when for, and how long they have left until their deadline. It is created using a CMS, while being further developed using PHP, JavaScript, jQuery, HTML5 and CSS3.



## Christopher Jerz CSS animation

I have designed and created a website application that demonstrates the use of CSS animation. The latest CSS3 properties have made it possible for me to create animation and interactivity in CSS markup, without the need for Flash or JavaScript solutions. Using CSS animation and 2D imagery created in Photoshop, I have transformed a conventional flat website appearance into 3D environment. I applied Squash and stretch, anticipation, staging, follow through and overlapping action, slow in and slow out, arc, secondary action, timing and exaggeration principles to my website using only CSS animation. Skills I have developed include: CSS3 Transforms, transitions and animation; animation with CSS and JavaScript for more complex interactions, motion mock-ups, motion prototypes and other helpful workflow techniques, performance considerations, designing with progressive enhancements in mind, future of web animation including web animation API and browser-based tools.



## Michael John Heads Archery artisan

Archery is a popular and growing sport accessible to both able and disabled persons. My project is a mobile app designed to be the go-to tool for archers. It will provide the user with a quick and easy way to track their progress and update all aspects of their archery needs. It can store details of equipment owned and used and also keep track of, and compare scores achieved over a period of time. To provide the largest possible accessibility for the app, it is built using a mobile framework called Ionic. Ionic allows apps to be published onto the iOS and Android platforms using modern web technologies such as HTML5, CSS3 and JavaScript. The benefit of this is being able to create it without using the native language of each platform. The project has been challenging and certainly improved my programming ability, as I encountered new languages and frameworks when building the app using Node.js and AngularJS. There was also a steep learning curve when creating the back-end with Firebase, a cloud based database which allows the app to sync data as it is updated by the user.



## Martin Kleis Project managing an EMR database build

I worked on a live joint project for The Movement Disorder Service based at the James Cook University Hospital. My roles for this were: project manager, customer relationship manager, business analyst, quality assurance strategist, tester and administrator. This project evaluated the manual procedures currently used. It will define a usable automated system using the latest technology to help speed up the process during patient visits. Initially, it was to create a prototype system for the Parkinson's Unit whilst collaborating closely with The Commissioning Excellence and Excellence Network. Furthermore, this will be a solution to an inter-departmental administration problem which can be very beneficial to many areas of the NHS. This has helped me develop my skills in all areas, especially project management and the Prince2 method of reporting.



## Adam Hilditch The real ale database

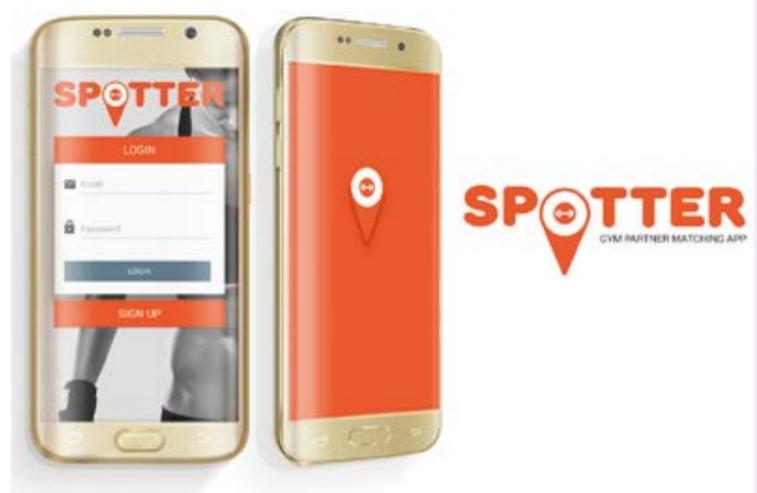
This project is a social and informational application aimed at real ale enthusiasts. It is built using front end JavaScript frameworks (Backbone JS extended using Marionette JS). Data and authentication is handled by Firebase. All interface and interaction elements are bespoke to this application, with no user interface frameworks employed.



## Charles Little Krowd

Krowd is aimed at universities. Krowd's main offerings consist of a secure social networking experience. Key project areas include; Registration/ Authentication, Posts, Polls, Conversations, Group Areas (Posts, Meeting Minutes, Conversation). From a recent study, it was made apparent that students disliked having to use many different platforms to carry out the tasks included in Krowd. Currently students use a combination of; Email (Messaging/Posts), Facebook (Groups or Messaging), Skype (Messaging), Survey Monkey (Polls), Pen & Paper (Meeting Minutes). Krowd removes the complexity of these services and rolls them into one centralised area. Krowd is built with Yii2, a solid Model View Controller (MVC) architecture. It demonstrates various programming techniques to create a unique user experience and uses a complex database system using MySQL. This handles the relationships between data that is submitted by the user. Charles has learned a lot from this project. Some key knowledge areas he has improved on are; MVC architectures, Yii2 & Plugins, database relationships, JQuery AJAX, Bootstrap 3, debugging, PDF Generation & E-mail functionality and user experience.





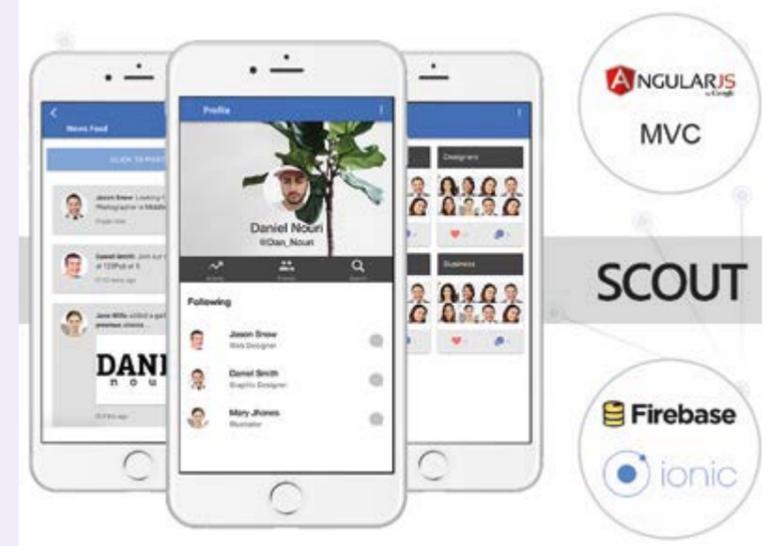
### John Paul Munster Spotter

As an avid gym goer I know how important it is to keep fit and how working out on your own has many pitfalls over working out with a partner. I have created Spotter. A hybrid native app that helps likeminded people to find their ideal gym partner in their local area, based on their experiences, goals, and training regime. The app has many other features that include a stopwatch, creating a workout plan and choosing your favourite exercises, seeing your progress, uploading photos, following other gym users and taking part in community and personal challenges. The app began life as a skeleton Yii Framework with PHP and MySQL to create the database. It was then skinned using HTML5, CSS3, MaterializeCSS, while JavaScript, and AJAX formed the connection between the front and backend. The app was then compiled using JQuery Mobile and PhoneGap to create an Android app. The logo and much of the design work was created using Adobe Illustrator and Photoshop as well as the humble pencil and paper.



### Daniel Nouri Divergent

I have produced an application called Scout. It is a mobile application that enables users to connect with individuals to form a team/group to work with on projects. Scout provides a database of contacts with a diverse range of skills/capabilities/experience. The application is built using the Ionic framework which combines a Model View Controller structured application with AngularJS (JavaScript) to create a powerful application that can be deployed across a variety of platforms (IOS/Android/Windows). Scout makes use of Firebase (JSON encoded database) for powerful backend user authentication and static hosting. My skills List: CMS, MVC, JavaScript, PHP, IONIC, JavaScript, JSON, JQuery Mobile, HTML5, CSS3, SQL, Action Script3, AJAX, YII, WordPress. Adobe Photoshop, Illustration, Lightroom, Premiere Pro.



### Adam Angell Multisite migration tool for WordPress

I have created a plugin for WordPress which aids the user in migrating a single WordPress site to a multisite installation (network of sites sharing the same themes and plugins). It creates a new site on the server and populates it with an archive of a site the user has uploaded. It takes all the files and moves them to the correct place as well as updating the database, changing all URLs and paths to the new server address. I have used PHP, HTML5 and CSS3 to develop the plugin.



### Sam Thomas Stevenson Collectors' shelf – an app for tracking collectable items

For my final year project I have built an application that allows users to track their collections (such as action figures, comics, coins etc). It allows users to take photos of items currently in their collection and add them to their 'owned' list. They can add details to the item such as its name, price they paid, quality etc. Users can also create a 'want' list where they can add stock photos or photos they have taken of items they want and add details to them. Once they obtain these items they can move them from the want list to the owned list. They can also share their lists using a link, which can be seen by their friends, family or fellow collectors. This link sends the user to a website, which means those that you share your collections with do not need to download the application to see it. I created this application by using PHP, Ratchet (mobile framework), Javascript, HTML 5, CSS3 & Mysql databases.



### Chris Norman IPMS Cleveland website

Having recently joined the local model group IPMS Cleveland, I was asked to redesign their website to attract new members to the club and inform people of the shows the club will be at. The club also wanted a gallery to showcase models that had been completed by members of club. The website was built with WordPress to allow the club to add content such as show reports. A child theme was created and edited to suit the requirements the club wanted. It makes use of the bootstrap framework and is responsive so that club members can view the website on their phone. The gallery on the website will allow the club to add photos of completed models, with a magnify capability, so that people can see the detail on completed models. Communication during the development was important as each meeting gave me chance to receive feedback from the club members and add features they wanted on the website.



### Steve John Walker Movenet Electronic Medical Records

My objective was to create a bespoke Electronic Medical Record (EMR) for the "Parkinsons Team" at James Cook University Hospital. The bespoke application consists of a secure authentication login system, where a team member will enter an admin panel, the authenticated user can view, add, edit and delete patient records also has the option to print or export as PDF or XLS file formats. Skills needed include Data Modelling, JSON, jQuery, MYSQLI and Object Oriented PHP, an understanding of RESTFUL apps, CSS3 and media queries.





### Proud to Innovate with Teesside University

Simpson Group is regarded as one of the Point Of Purchase industry's most dynamic and innovative players delivering to over 14,000 retail outlets ever quarter. Home to Europe's only simulated shopping mall; we strive to be the clear market leader in cutting-edge POP & POS by constantly investing in pioneering technology and client-benefiting services.

Through a collaborative research relationship with Teesside University, Simpson Group are actively recruiting computing graduates, for more information on the breadth of opportunities available please contact:  
Mark Flanagan m.flanagan@simpsongroup.co.uk Tel: 0191 419 8671



Simpson Group - Washington  
Influence Park, Rutherford Road, Stephenson, Washington, Tyne and Wear NE37 3HX  
T. 0191 416 1579 F. 0191 419 8660 www.simpsongroup.co.uk www.shop4pop.com



# tombola™

## Web Developer? Game Developer?

Help power one of the largest and fastest growing international online gaming companies. Join our software team located on the riverside, Sunderland.



[tombola.co.uk/careers](http://tombola.co.uk/careers)

@tombolacareers



# YOU BET WE'RE PROUD...

### There's a new Yorkshire team in the list of 100 best companies to work for. And we've only been independent for 12 months!



Constantly pushing the limits to provide brilliant online betting and gaming experiences, we've set our sights on the top spot. We want to be the UK's best digital business. So, we're now looking for the best tech graduate talent to join our fast-track programme in Leeds and Sheffield.

It all starts in July with a 14-week burst of training provided by our partners Sparta Global. You'll develop your business skills and get up-to-speed with our tech, software and agile way of working. Learning at 100mph you'll soon find yourself writing code and getting your hands on new tech and real-life projects.

### So what do our people love about working here?

Our people know us better than anybody else. So, their comments really counted when The Sunday Times put together their list of 100 Best Companies to Work For. 398 of our people filled out their survey anonymously.

Here are just some of the things they said.

**"This is a great place to work because we're constantly moving forward and are one of the UK's best brands."**

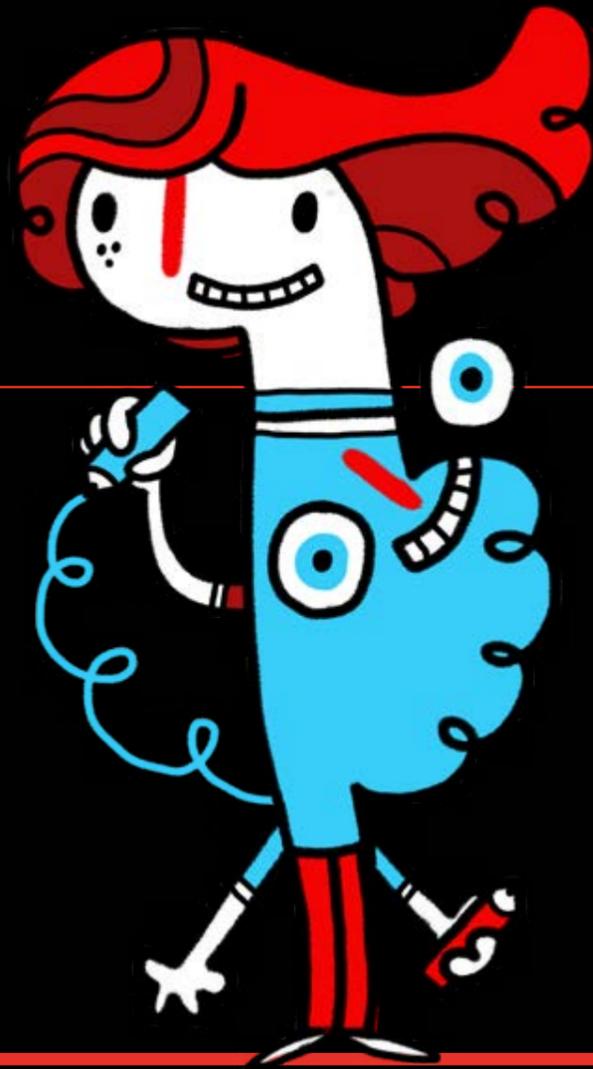
**"It's a dynamic environment where you're surrounded by clever people and challenging projects."**

**"The company clearly cares about creating a great working environment and regularly rewards staff for performance."**

And there's also our Sunday Times 100 Best Companies award-winning tech ninja fund - giving you £1,000 to develop your skills any way you like. You can buy the latest tech. You can use it to get your hands on some new kit. Or you can go on a tech talk, digital conference or networking event. How you spend it is up to you.

Want to find out more? Visit [skybetcareers.com/graduates](http://skybetcareers.com/graduates)

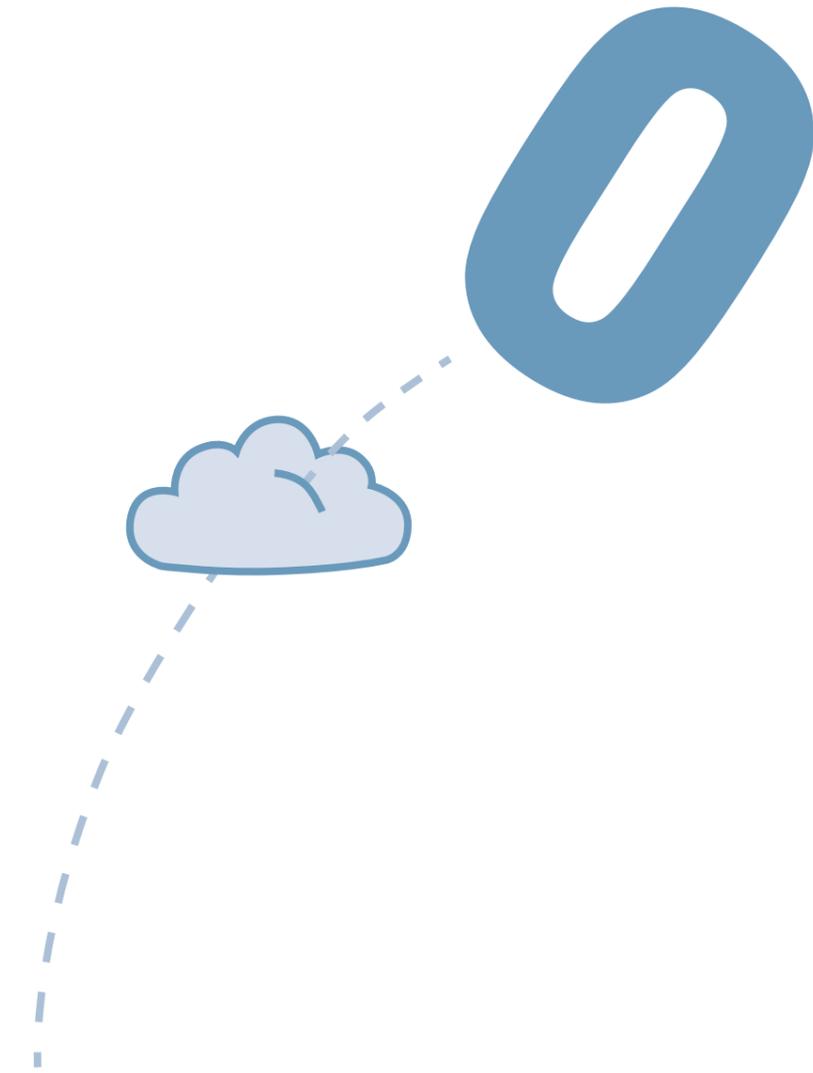
2017  
**animex**<sup>®</sup>  
International Festival of  
Animation and Computer Games



## The UK's biggest and best festival of animation and computer games

The Animex International Festival of Animation and Computer Games takes place every year at Teesside University. It is the largest festival dedicated to animation and computer games in the UK. Speakers and representatives from the global animation and games community gather for a week every year to educate, inspire and entertain an audience made up of professionals, students and enthusiasts.

**Find out more:** [www.animex.net](http://www.animex.net)



## Computer Science

These diverse research and development projects encompass a range of topics from the highly abstract and theoretical branches of computer science to the practical applications of the theory in systems design, software development and ICT. Our courses are constantly updated to ensure that we are ahead of the game in providing students with the skills to develop systems and solutions using the very latest technologies. This can be seen from the selection of projects on show, which share a common theme – innovation and experimentation. All of our BSc programmes are reviewed and accredited by the British Computer Society.



Teesside University's School of Computing offers world-class computing facilities, including a wide range of web, multimedia, network and programming studios. Students have 24-hour access to labs and studios during term time, ensuring that we provide one of the UK's best teaching environments.

## Undergraduate

-  FdSc Computing
-  FdSc Computing (Networking)
-  Computing Foundation Year
-  International Foundation Year (Business and Computing)
-  International Foundation Year (Global Issues)
-  BSc (Hons) Artificial Intelligence Systems
-  BSc (Hons) Computer Science
-  BSc (Hons) Computer Security and Networks
-  BSc (Hons) Computing
-  BSc (Hons) Data Science
-  BSc (Hons) Information Technology (IT)
-  BSc (Hons) Information Visualisation
-  MComp (Hons) Computer Science

## Postgraduate

-  MSc Computer Security and Networks
-  MSc Computing
-  MSc IT Project Management
-  Research Degrees

## Graduate Profile

### Marc Davies BSc (Hons) Computer Science

Marc's career has developed since ExpoTees

'I landed my job at hedgehog lab through internships and ExpoTees'

Marc Davies studied BSc (Hons) in Computer Science, because he loves developing all types of applications. His job allows him to work on large web applications as well as android and ios projects.

'Teesside University was a natural first choice for me, with its reputation for computer science and computing. On the course, I developed a wide range of skills, which enabled me to develop applications for anything.'

'The course is tailored around providing you with the skills you need to get your first job in

the industry, and the equipment and teaching materials are top notch. Some of the lectures delivered by the careers service about how to write a good CV and interview tips were really useful when I was interviewing for my placement and my current job.

'I hope to further my career as a developer and keep learning about the new and exciting technologies that appear all the time within the industry. One day I hope to build my own technology company, working on projects that will change the world for the better.'



## BSc (Hons) Computer Science



### Jordan Matthew Atkinson Trendbase

This is a responsive web application which creates visual trends based on information generated from business generated operational

data. Its main purpose was to investigate how trends appear inside almost any database which companies are not analysing. It was modelled around a train line system in which the data was generated from a custom C# data. The data was extracted from numerous data sources to mimic real-world data source variation into an SQL server database. The web application extracted this data after being passed through a separate algorithm engine to analyse the trends. These were then visually represented to the end user. The database which the data resided in was a custom built database designed to handle big data.

The system focused around my interest of big data and data processing (influenced by my placement year at DuPont Teijin Films). I wanted to highlight to companies possible data that is crucial to the business and influences objectives which would help steer them to produce more targeted products or marketing campaigns.

C#, .NET, JavaScript, SQL Analysis were some tools used for this project



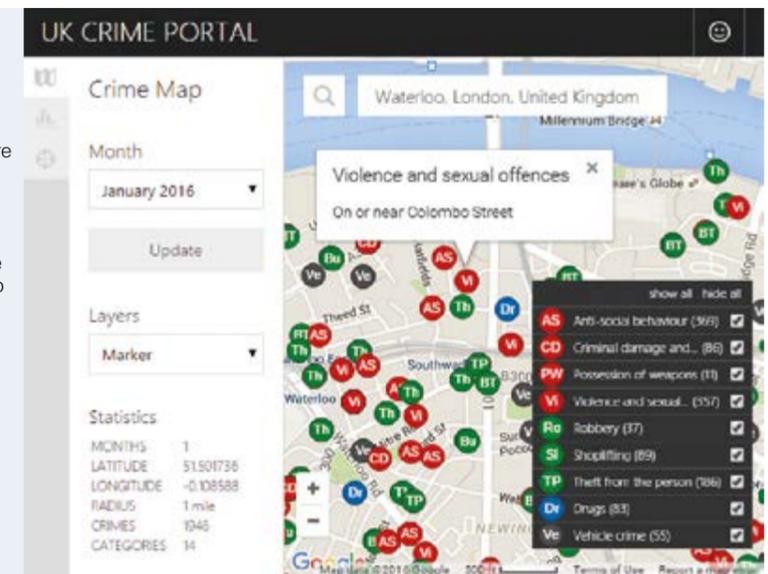
### Michael James Cataldo UK crime portal

The UK Crime Portal is a web based application that is used to gain insight into the level and nature of crime activity for any location within the UK.

It enables visualising historical crime data through plotting instances of crime on a map and rendering thermal images to reveal patterns in the data and to show where crimes are clustered. Visualisation is further facilitated by displaying a range of histograms to represent the latest trends in street crime and to account for the long term patterns in UK crime.

In addition to visualising data, a variety of supervised learning techniques are used to support predicting future crimes at specified locations. This includes using linear and tree based regression to learn from the patterns that are hidden in the vast street crime dataset. A further goal of the project was to experiment with building a distributed architecture based on the micro-services architectural pattern.

The application is backed up by a range of back-end services which have been developed in C# and JavaScript. A Node.js server is also used as an API Gateway to decouple front-end applications from back-end services.



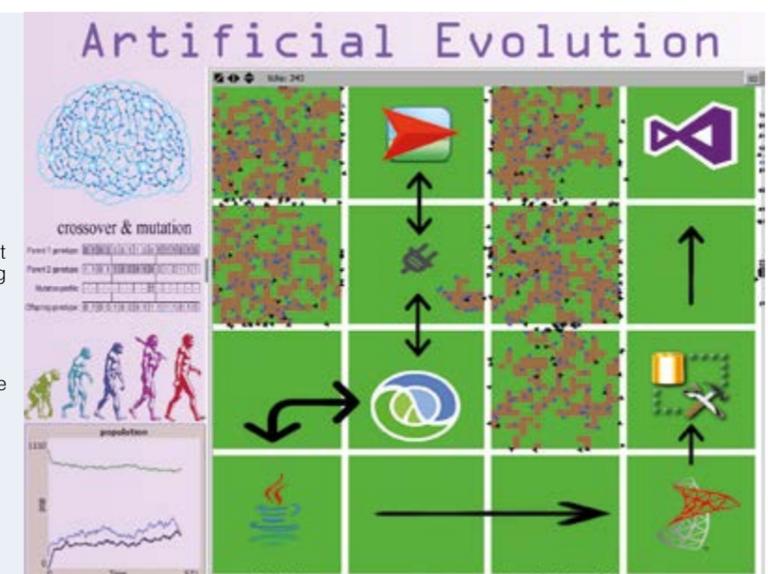
### Abel Germa Artificial evolution

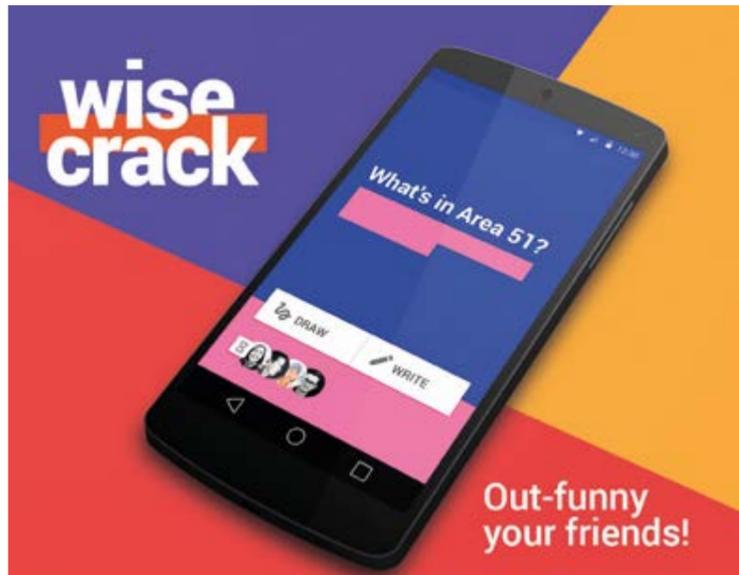
My Artificial Intelligence research project aims to establish whether Darwin's theory of natural selection can be used to solve algorithmic problems.

Using the Agile methodology, my first goal was building an environment to force the agents, something that perceives its environment through sensors and acts upon it, to evolve and test out whether they modify with each generation. I was investigating if they adapt to the environment just as animals do according to Darwin's theory.

I have used Java to store agents' DNA, Clojure to retrieve DNA, translate it into commands and send it to Netlogo where agents interact with the set environment. Challenges agents face include getting to food first. They need to be fast but also sense food that is far away. The agents that perform well will continue to live and also have offspring.

All results are stored to see how the agents evolved over time. I also investigate how this evolution process can be used to solve real life problems.





### James Healey Wisecrack - multiplayer android game

Based on games such as *Cards Against Humanity* and *Quiplash*, players are prompted to give funny answers to a given question in the form of either text or a drawing, then choose their favourite answer from the other players. The winner of the round is the player with the most votes, and after a few rounds, the player with the most rounds won wins the game. The game can either be played as a quick party game or at a more casual pace, played throughout the day, perhaps during work breaks.

Game logic and data is stored and synchronised in the cloud via an Azure-hosted SQL database and ASP.NET Web API web service.

The project was developed using an iterative methodology, and followed a test-driven development (TDD) style.



### Sam Ogle Educational learning resource systems

Education, like most environments, depends on the internet and with virtual learning environments being required for nearly every educational establishment in the world I felt it would be a challenging and resourceful final year project to design and develop a new VLE system.

A few of these systems offer so much, however all of this potential can sometimes be missed or seen as confusing. I wanted to build a system which did exactly what a school, college or university needed and could be adapted to any area whether this be IT, child care, law or brickwork or any educational establishment's needs.

My project required extensive market research to see about filling that gap on the market to get what students want. My system is built using WordPress which allows a wide range of customisable features. This is a tool which should be resourced by everybody and every school, college and university which can be beneficial to all.



### Saul Alexander Johnson Crisp

Crisp is a new purely functional lisp dialect geared towards programming for the web. It features an interpreter and server for serving dynamic webpages generated using the language. It revolves around a plug-in architecture allowing the language to be extended with new special forms using C#.

It includes a standard library written in Crisp, as well as special forms for database access and string manipulation. Inline Crisp code within webpages fully supported in a similar style to PHP.

The demonstration will showcase Crisp as a useful development tool for writing efficient, clean code using a simple and powerful functional approach, as well as exploring the theory behind and architecture of the interpreter itself.



### Nicole Robson Green city sim

The aim of the project was to create an AI simulation to explore how green living in a city could function both economically and sociologically.

It sought to answer whether green living would be sustainable if a city chose to solely run on green energy sources. It also looked into whether this change of lifestyle would have a sociological or economical effect - and if so - to what extent.

To assess this extent, business intelligence tools were used to represent result data through reports and graphs to provide evidence as to whether green living was truly sustainable. The project was made using Clojure and Netlogo, as well as utilising SQL Server and Visual Studio. Through developing the project I became more proficient at AI development, database development and using Business Intelligence Tools such as SSIS, SSRS and SSAS.



### George Milner HomeCloud a smart home platform with temperature control

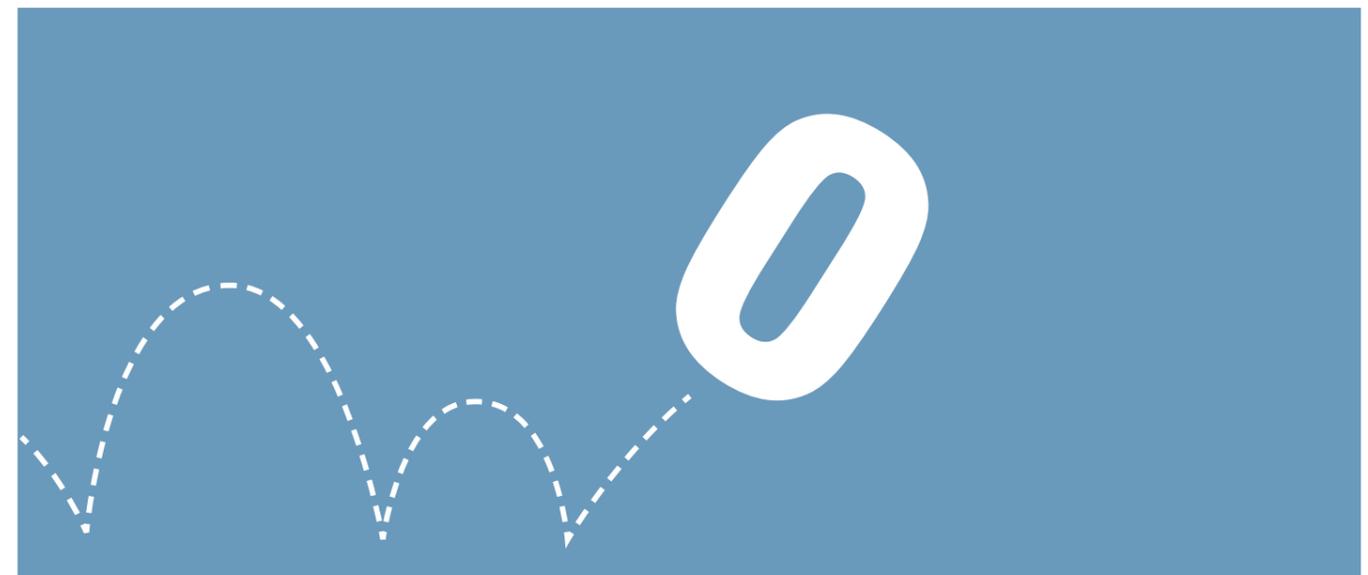
HomeCloud is a new platform providing a smart home control system that allows users to set heating schedules and temperature thresholds from their smartphones. It has location awareness, automatically triggering the heating to turn on when you are a specified distance away from home.

HomeCloud communicates with an embedded, WiFi-connected computer and thermostat that hooks up to the customer's boiler. Customers without internet access can customise the boiler schedules via an intuitive web interface (that runs locally, similar to a router configuration page). A Raspberry Pi was used as the embedded system that attaches to the boiler.

Microsoft Azure Service Bus is used to provide NAT penetration, allowing the mobile application to communicate to the Raspberry Pi. It was built using the Xamarin framework to allow for deployment across multiple smartphone platforms.

A variety of other software languages were utilised, including Python, C#, PHP and MySQL.

Currently a prototype, the final product could include other smart home features, such as security cameras, carbon monoxide detectors, and lighting control.





### Oliver Slade MeCommerce - eCommerce redefined

My final year project is a cloud based e-commerce system with CMS functionality. This system is built in C#.NET and uses the Azure cloud to host and manage a scalable system and database.

The system allows shops to easily sell their products online as well as managing all aspects of the website through a clean user interface. The difference with my system is that it makes use of Azure database technology and is hosted fully on the cloud.

The skills I developed during this work are an increased proficiency with cloud technologies and C# Web Development as well as increased exposure to front end web development technologies such as HTML, CSS and JavaScript.

## The Future Of Databases?

### Relational VS Graph



### Alex Youngman Critical comparison and evaluation of graph databases versus relational databases

My final year project is a critical evaluation of database technologies, with a focus on geographical and big data.

The project is heavily research focused, based around a comparison between the popular relational (SQL) databases and the new graph (Neo4j) database technology.

This involves valuing the strengths and weaknesses of each type of system along with the business value of adopting each into a business that currently uses the alternate.

It will also involve testing some large scale, realistic data (big data), provided by a third party company. This will be primarily geographical data, though on an industrial scale.

I am in contact with a local company, Clicksco, who are supporting this project and providing real data for me to make effective use of.



### Luke David Brown CollectorNation

CollectorNation is an all-in-one platform for collectors of physical media. It is a web application that allows users who collect forms of physical media in the genres of video games, music, film and TV. Moreover, it allows them to keep track of their collections, view a repository of different items, put up items for offer or list an item that they are looking for, show off an item in their collection that they have acquired, keep a user profile to look at users with similar interests, communicate with other users through the use of a user forum. Users can also view analytics based on the system.

Having all of these features in one place builds a community of users who are all interested in collecting physical media. The drive for this project was based on a personal interest in the subject along with an experience looking for an item online and not being able to find sufficient information on it easily, therefore the idea of a repository for collectors was founded. This initial idea was expanded to add numerous features that a collector would use. The product was developed using Microsoft SQL Server with HTML, CSS and C# in Microsoft Visual Studio.



### Connor Burdekin - Roberts SecureKnow

SecureKnow is an engaging, intuitive and professional security awareness training platform. The security industry is growing at an exponential rate, with security spending reaching over \$80 bn a year.

Security awareness is key within the enterprise, over 50% of security breaches are caused due to lack of security awareness and knowledge.

SecureKnow will be based upon a bespoke theme using WordPress as its engine. WordPress offers excellent functionality that will allow the product to exceed its competitors.

The project allows me to further my security knowledge, expand my skills and knowledge of WordPress and improve on my CSS3, HTML5, PHP and JavaScript skills.



### Andrew Peter Challice DebtAid By Challice

I will be showing a piece of software which is a personal finance management programme specifically aimed at those in unmanageable debt. This allows users to input financial information and the programme will then produce a number of budgets to help the user manage money.

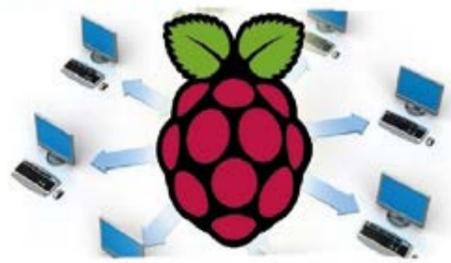
My knowledge and expertise with Java has increased throughout the project along with being able to engage with users (prototypes) which have helped me with the design and testing phases of the project.



### Lewis Chapman Emergency Virtual Private Network

The work that I wish to display is my Computer project proof of concept idea, I plan to show off my idea of connecting an ambulance and a hospital together while on the move via 3g/4g connection





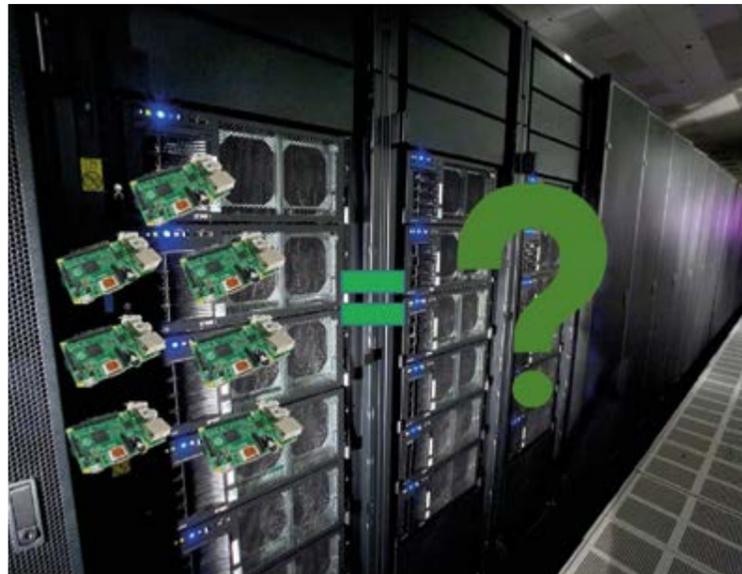
**Raspberry Pi File Server**



**Jack Grieves**  
**Providing a low cost network solution to meet business needs**

I approached the small charity organisation RT Projects as they required a low-cost network solution that provided them with more functionality than their current network. They only have a small router with their PlusNet broadband connection and a shared Dropbox account to store all the organisation's documentation. Due to the organisation being a charity any solution I came up with would have to be as low-cost as possible.

My solution was to use a Raspberry Pi with an attached local storage such as memory sticks, as they do not require a huge amount of storage. I plan to use an open source server and operating system to provide a system that can authenticate and store usernames and passwords. Open source means that the software will not cost the organisation. Once the system is built and configured, it can be plugged into their existing router to expand the network.



**David Marshall**  
**Raspberry Pi 2 supercomputer**

Could a few cheap single board computers combined provide greater performance than several hundred-pound desktop class machines? Using distributed computing libraries, and the Raspberry Pi 2, I endeavoured to find out.

True supercomputers have two major weaknesses – power consumption and the level of cooling required. Recently more and more computationally intensive tasks are being solved using distributed computing. Thousands of desktops and laptops around the world are doing little bits of the problems and sending the information back to a central computer.



**Josh Middleton**  
**MyFit: an Android fitness package**

MyFit is an ideal implementation, for users, of an Android fitness application and hardware. The application takes a standard fitness application and also a different approach. It allows the users to decide what they want to see. Instead of learning how to use it, they can change it to work for them. Most applications bombard you with statistics, however MyFit lets users choose what they want to display. From steps, to speed, to calories burned every user is different and this project allows them to use it in their own way, and not have a cluttered application with every statistic possible. MyFit will be accompanied by a fitness band, hardware which will track the user's movements and relay gathered statistics to the application.

It was built using Android Studio and the Arduino IDE for programming the hardware. This has expanded my knowledge in both areas, and has given me an insight into both sides of the development process, the building of the application, and the development of accompanying hardware.



**Munyaradzi Liberty Mubaiwa**  
**Prototype simulation of the campus network**

I have produced a prototype simulation of the campus network and in the process I have demonstrated how this influences rapid design prototypes. It is also an opportunity to showcase what happens to networks behind the scenes. This makes employers understand that networks still perform a vital backbone for all the things that makes a business proceed successfully.



**Billijo McKittrick**  
**SCM – Companion**

My Android application provides students across all years with a companion application that provides all the information they may need in one place, where previously they would have had to access 3 or 4 different areas of the website. The main areas that will be available to students include the likes of Blackboard, Intranet, E-Vision, Staff list and availability of labs, plus many others.

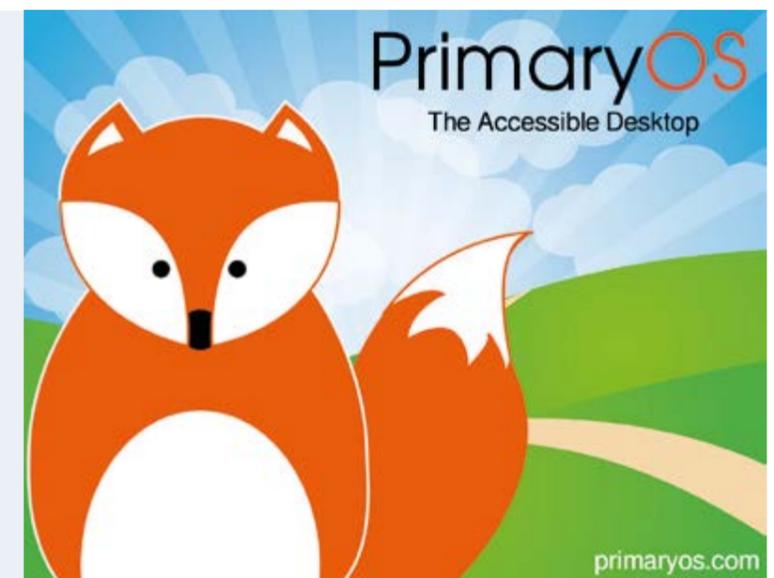
To appeal to its target audience and encourage regular use of the mobile application, it incorporates a significant social aspect that allows users to communicate with one another via a chat room and a forum. The chat room allows multiple users to have a live discussion about particular aspects of work, for example various modules or projects they are working on, whereas the forums allows users to post multiple threads that will stay active unless the original user deletes the post. Specific categories will be set out automatically that will include the module name.



**Christopher Ramsey**  
**Primary OS – the accessible desktop**

My final year project is sharing my passions for Linux, open source technologies and accessibility. The aim was to build a Linux based operating system for the visual and hearing impaired with focus on primary school education. PrimaryOS has been designed to be accessible from the start-up menu with educational software and games that will promote an independent learning experience for children aged 5 – 11 years.

PrimaryOS can deliver an accessible, out of the box, desktop experience that requires zero configuration. It's simple, safe and secure.



## Sundowner ROM

A custom Android experience

- Performance
- Battery Life
- Customisability




**Qamar Riaz**  
**Sundowner ROM – a custom Android experience**

This project aimed to create a custom Android firmware that adds extended functionality to the stock Google firmware that comes preinstalled on many Android smart devices. This tackled the problem with stock Android firmware that does not allow users to easily customise their device to their individual needs. The user would be able to customise the custom Android firmware in the sense of how it performs on the device itself i.e. change how fast the device runs applications or how the software looks, and would be able to apply a theme to change the colours or icons of the device. Increased functionality can be achieved through adding more settings that the user cannot access with a Stock ROM, such as the ability to change the toggles in the notification bar from the default layout and toggles to meet the users' needs. For example the user can remove an unused toggle such as the Aeroplane mode toggle and add a custom toggle such as Battery Saver toggle so the user can get the most use out of their device.

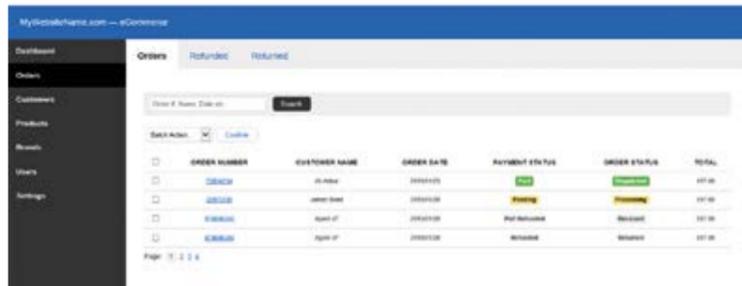


**Will Thomas Whitehead**  
**SCIPA**

Process automation is a key system in most of today's industry. The ability to actuate hardware based on a user-defined configuration and real-world sensory data is new. The data collected can be used to improve process and business efficiency, as well as safety. Reading data from a range of inputs, such as serial devices, databases and flat files, SCIPA was designed to follow a set workflow and actuate a real world output via the transmission of commands. Process data is stored using a combination of SQL Server and MongoDB databases which act as a platform for the built-in business intelligence features. These features allow users to analyse the data retrospectively, ultimately improving profitability and process effectiveness. I've developed my skills as a programmer, a software engineer, database architect, project manager and been introduced to the worlds of chemical engineering and big data. The next step for SCIPA is to introduce distribution, taking the project from a SCADA package to a full blown distributed control system.



## floweX



ORDER NUMBER	CUSTOMER NAME	ORDER DATE	PAYMENT STATUS	ORDER STATUS	TOTAL
100001	John Doe	2015-01-01	PAID	Completed	100.00
100002	Jane Smith	2015-01-02	Pending	Cancelled	150.00
100003	Bob Johnson	2015-01-03	Not Paid	Cancelled	200.00
100004	Alice Brown	2015-01-04	PAID	Cancelled	250.00



**Adam Riddick**  
**FlowEx**

With my third appearance at ExpoTees, the first in 2013 with a financial application developed for the Citizens Advice Bureau, and the second as a sponsor presenting an award for innovation as the technical lead for Pea Soup Digital in 2015, I am showcasing FlowEx – A modular business platform. After spending three years in industry architecting software and business intelligence solutions, I intended FlowEx to be an exploration into a multi-tenant, n-tier, Software-as-a-Service architecture, which is both scalable and extendable, that could be utilised in the creation of a modular cloud-hosted platform offering turnkey solutions. The progress of the project has resulted in an implementation with a release candidate e-commerce module that is ready to be expanded with additional modules. The FlowEx interface is implemented using HTML5 and CSS3. Visual Studio 2015 Enterprise was used as the IDE, utilising the .Net Framework, MVC5 with a custom view engine, Entity Framework 6, Dapper.Net and the Liquid templating engine.



**Naveed Younas**  
**BeSporty**

I developed a web based system for Teesside University sport clubs which encourages students to join sport clubs through an online system and provide university sport clubs an online presence. A membership system and booking system were created. It allows students to join, gain membership and book sports hall through online system. During this project I have used Visual Studio C# MVC framework. A back-end database was created by using SQL Management Studio and connected with the web application using the entity frame work.



## FCM SYSTEM

Forensic Computing Management System



**Farhaad Wasim**  
**FCMS: Forensic computing management system**

For my project, I have created FCMS, a case management system designed to be used by forensic computing departments, to help them manage their investigations. The system allows forensic examiners to add, view and store case information, including details about staff/people involved; collection information and supporting evidence. The project was chosen to help improve my skills in systems design and development, but also within researching by allowing me to explore the different areas within forensic computing. The application was built in Java EE, using the Spring Frameworks MVC (Model, View and Controller) architecture, Hibernate and a MySQL database. HTML5/CSS and jQuery was used for the front-end.



**Gary Bell**  
**Student halls of residence maintenance software**

My final year project involved a live client. It was a sound concept and was much needed to make the maintenance side of the business run smoothly. The skills required for this artefact were: front-end development: HTML, CSS, Visual Studio and MVC, back-end development, integrating existing systems into one compact software package and large amounts of time to develop this robust system to administer it to the client.





**Majhar Hussain**  
**Fitness Buddy**

I will be exhibiting a web application at Expo Tees I have developed, which includes a back-end database and a front-end design. The main aim of this project was to create a gym comparison website, which allow users to find gyms close to their location. The website also contains a section, which allows all users to view exercise help, which will benefit them if they are new to the fitness world as they can avoid any potential injury that can be caused by using the wrong techniques when exercising. This is also very helpful, while in a gym as all the information can be gained via a mobile device with internet connection. The website has been created to work on multiple platforms, such as tablets and phones, therefore it will be responsive and also I have made sure that it is secure by using various different security methods.

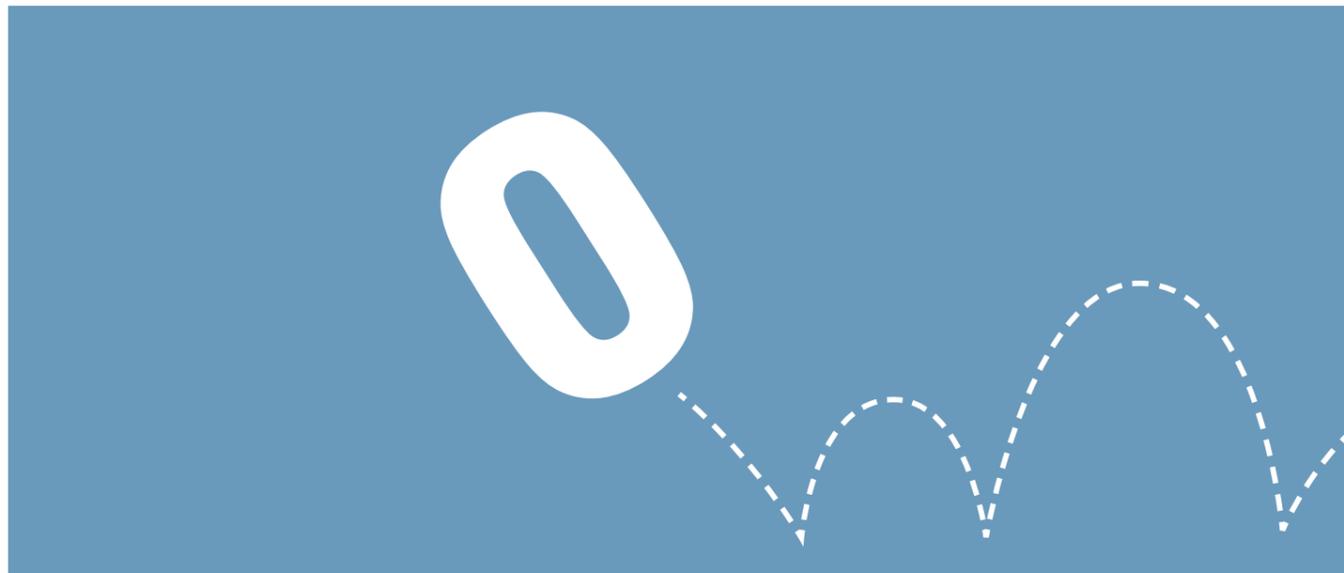


**Obinna Emmanuel Nwanyanwu**  
**The roles of PLCs in the modern processing industries**

The aims of this project were to research:

- the roles of programmable logic controllers (PLC) in modern industries
- the problems industries are facing using the programmable logic controller
- how to analyse the findings and discuss solutions.

A PLC can be defined as a specialized computer that is used for robotics of generally electro-mechanic processes, for instance an operation of equipment or system on factory assembly lines. This area was new to me and I have developed new skills and knowledge.



## Conference and meeting facilities in Darlington

With a range of meeting, conference and breakout spaces, we're flexible enough to meet all your business needs, from small group meetings and training days with colleagues to exhibitions and networking events.

### Features:

- > prime location close to the A1(M) and Darlington railway station
- > on-site parking
- > high specification AV equipment
- > a wide variety of catering options



Enquire now:

01642 384068  
theforge@tees.ac.uk  
tees.ac.uk/theforge



**THEFORGE**  
Together with business



## FUSION HIVE



### MEETING AND TRAINING FACILITIES

#### IMPRESS YOUR CLIENTS BY HOLDING YOUR MEETING OR TRAINING EVENT AT FUSION HIVE

Located close to the town centre at the heart of Stockton's Northshore area with easy access to national road and rail links, we can host meetings of ten people through to events for up to 40 people.

Contact us:

01642 384400  
info@fusionhive.co.uk  
fusionhive.co.uk



**THEFORGE**  
Together with business



**£10K POSTGRADUATE FUNDING**

**NOW AVAILABLE**

Visit between  
2.00pm - 7.00pm

Find out more at  
our open day

**Wednesday 13 July**

**BOOK YOUR PLACE**

[tees.ac.uk/visitus](http://tees.ac.uk/visitus)

## Graduate Profile

**Daniel Green** BSc (Hons) Computer Games Programming



# I chose postgraduate study to further my career and open myself to future opportunities

Daniel graduated from Teesside University with a BSc (Hons) Computer Games Programming. He's since travelled the world, conducting simulation research in China and working for a software company in Japan. Now he's back to study a master's degree.

'After my degree, I went straight out to China, researching physically-based simulation at the Institute of Software, Chinese Academy of Sciences (ISCAS). I planned to start an MSc/PhD there, but inspiring talks at my graduation ceremony convinced me to try a different route.

'I've always been a fan of working internationally; the language, the culture, the new ventures, everything is interesting. I decided I wanted to experience the beautiful nature and culture of Japan first-hand.

'I never thought in a million years I would be able to work in Japan, but I tried anyway. After a lot of research and making lots of contacts, I was hired by Vitei Inc. as a Games/Graphics Programmer, but shortly after switched to a Technical Artist role. I learned a lot about how to (and how not to) do things in games development.

'I've returned to Teesside for a postgraduate course to further develop my career; more specifically to open myself to future opportunities like a PhD, research, or jobs.

'Originally, I opted for the MSc Computing, but it soon became apparent that it wasn't the course for me. I had become a relatively experienced programmer by that point, so the course didn't challenge me as much as I would have liked.

'I managed to arrange an internal transfer to MA Computer Animation and Visual Effects, which I'm currently studying. Since I have a degree in programming, but am self-taught in the arts, this MA means I will be formally trained in both disciplines, which is vital for a technical artist.

'The MA is very flexible and allows me to spend a year focusing on my artistic side. This is what really attracted me to the course – I also have the creative freedom to spin my university projects towards games or even make them slightly technical.

'As for the future? I have considered a PhD in AI at Teesside, but I still have the desire to move abroad again, for work or study. My options are open.'

# Master's project exhibitors

Our master's students spend three-four months full-time on their individual projects.

The project's purpose is to be a piece of academic research, where students aim to discover something new and also place it in the context of previous work by others. They are required to research and investigate a topic relevant to their master's course and then produce a 'major deliverable' which helps to add to the body of knowledge about their chosen topic.

Naturally the nature of the major deliverable varies greatly across each master's route,

and could include novel application of techniques, exploration of a particular artistic genre, development of innovative software, findings from field research or results from lab-based experiments.

We try to mirror as closely as possible the academic research process followed by staff researchers. As one of their project outputs, students are therefore asked to design an academic research poster, which they must

present to an audience at a public event.

Master's students who are due to complete their projects at the end of May are displaying their research posters at this year's Expotees event.

For more information about postgraduate study at the School of Computing please contact:  
Dr Elaine Pearson

T: **01642 342656**  
E: [e.pearson@tees.ac.uk](mailto:e.pearson@tees.ac.uk)



**Chaitra Nagaraja**  
**MSc Computing**

The project will investigate functionalities and capabilities of NoSQL database Microsoft Azure DocumentDB with a set of data and compare it against similar set of data on relational and graph database



**Alok Verma**  
**MSc Computing**

My project evaluates how effectively a complex relational database can be implemented into a document oriented NoSQL database using MongoDB



**James Dickenson**  
**MSc Computing**

My project is based on Evidence Based Practice, and investigates if there is solid evidence behind using iPads as a learning device in schools.



**Emmanuel Akele**  
**MSc IT Project Management**

Performance of IT employees in the work place – a case study on the banking and shipping sectors in Nigeria



**Dean James Chaffer**  
**MSc Computing**

Assistive technology measuring the impact on the disabled student experience.



**Abdulrahman Almarri**  
**MSc IT Project Management**

Oil exploration: A data mining approach to optimise operations



**Sophie Smart**  
**MA Computer Animation and Visual Effects**

Integrating VFX into 360 video or virtual reality



**Rebecca Martin**  
**MA Concept Art for Games and Animation**

A practice based investigation into how to adapt a novel with supernatural themes for a child-friendly 3D platform game



**Angela Acquah**  
**MA Concept Art for Games and Animation**

Gargoyles 2016 – A modern interpretation of Disney's animated TV series



**Ran Zhang**  
**MA Computer Animation and Visual Effects**

Under the battlefield



**Andrew Bashforth**  
**MA Computer Animation and Visual Effects**

Rigging tools and solutions for a streamlined pipeline



**Jo Anne Kwee**  
**MA Concept Art for Games and Animation**

Adapting novels into a deck of tarot cards



## Acknowledgements

ExpoTees is the result of the hard work and dedication of many colleagues and supporters. The team would like to thank everyone who has contributed to the success of ExpoTees 2016 and past events.

We would particularly like to give our heartfelt thanks to our event partners, Accenture, Amplience and Sky Betting & Gaming, and our sponsors. We are very grateful for the support and dedication given by our School of Computing management team, Department of Academic Enterprise, staff at our Darlington campus and the Department of External Relations, and the Careers Department for their help preparing the students for ExpoTees and beyond.

Every final-year undergraduate student is guided through his or her project with the support of a project supervisor. We would like to express our gratitude to Dave Eagle, projects co-ordinator, all the project supervisors who make ExpoTees possible, and the final-year students who make the hard work worthwhile.

For any questions about ExpoTees please contact Steven Mead

T: 01642 342671

E: [steven.j.mead@tees.ac.uk](mailto:steven.j.mead@tees.ac.uk)

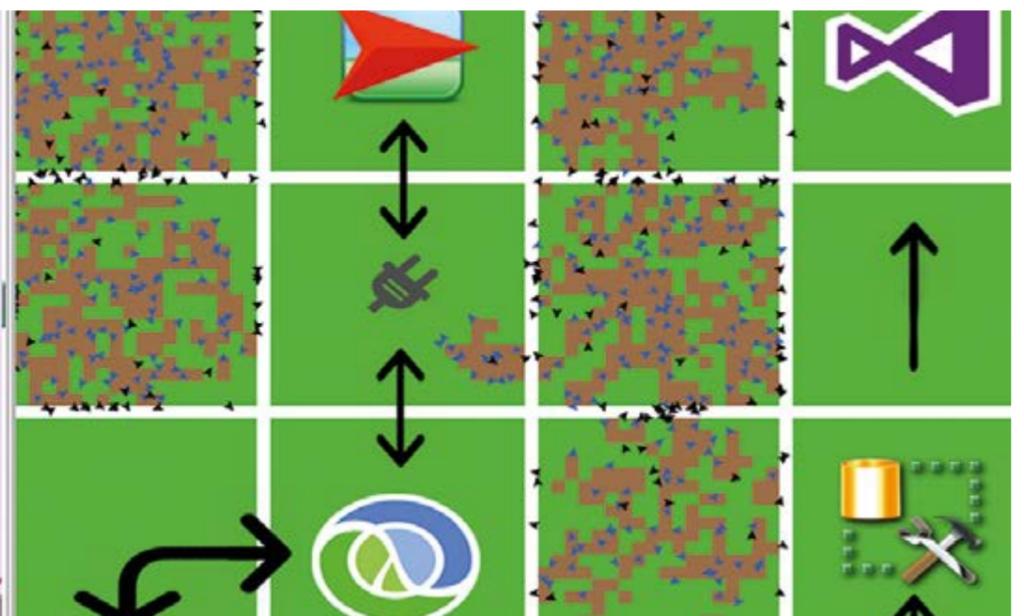
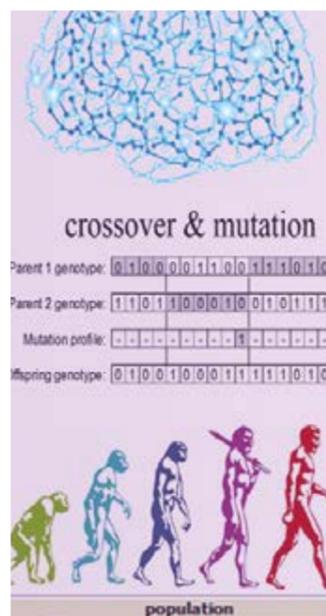
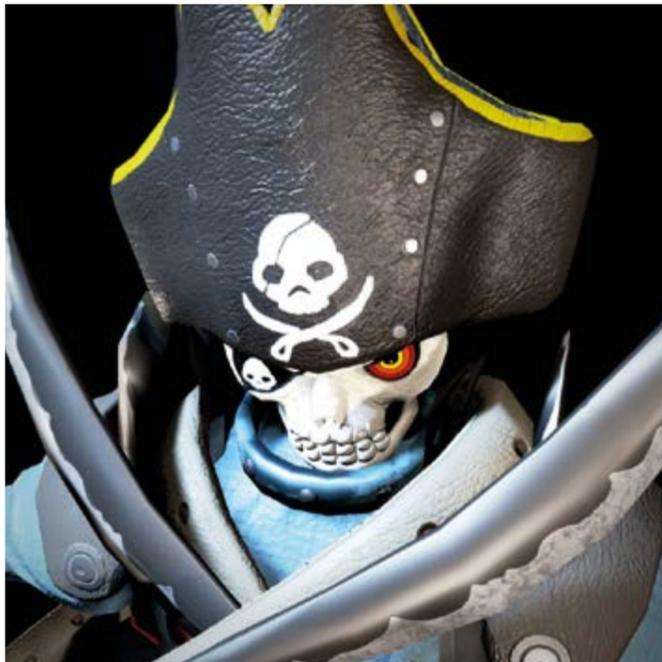
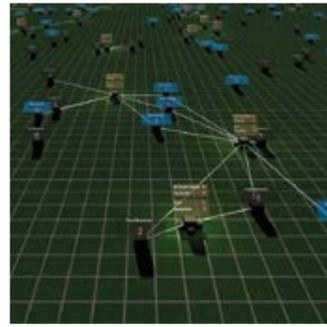
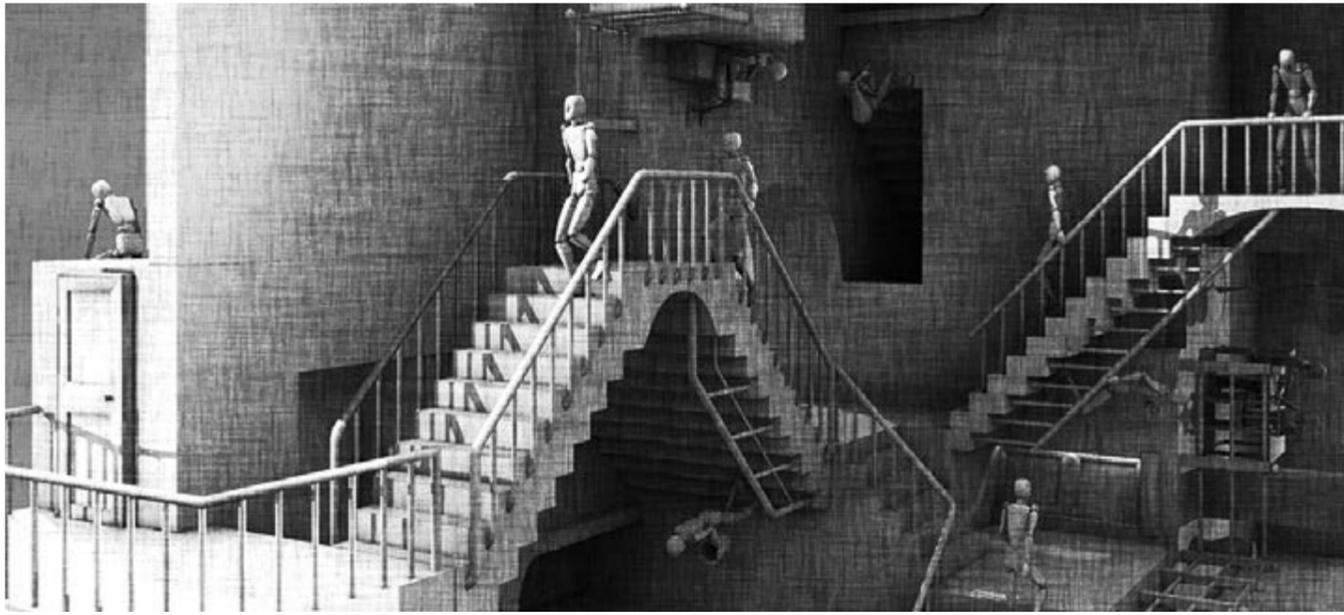
**Stay in touch** – join us on our open LinkedIn ExpoTees group and meet academics, ExpoTees exhibitors past and present and all our supporters who have worked to make ExpoTees a success.

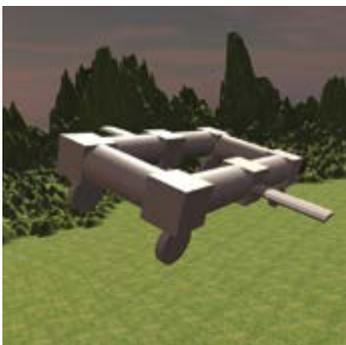
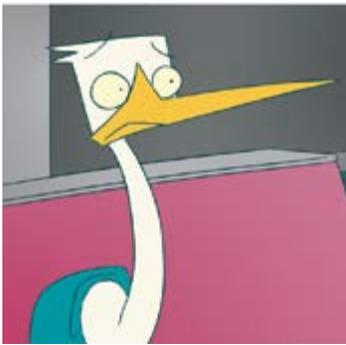
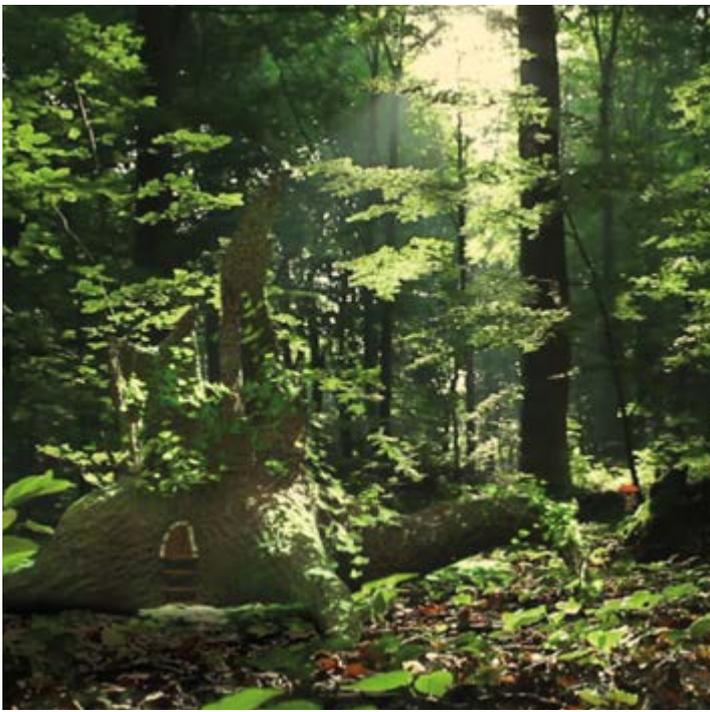


## Sponsorship

ExpoTees is enriched by the support given to us by our event partners and sponsors. If you are interested in being part of this fantastic event in the future, please contact Joanne Marwood:

T: 01642 342608 E: [j.marwood@tees.ac.uk](mailto:j.marwood@tees.ac.uk)





This publication is available in alternative formats on request. Please contact the School of Computing on **01642 342649** or email [scm-enquiries@tees.ac.uk](mailto:scm-enquiries@tees.ac.uk).

**Teesside University**  
Middlesbrough  
Tees Valley T: +44 (0) 1642 218121  
TS1 3BA UK [tees.ac.uk](http://tees.ac.uk)