Welcome

ExpoTees 2013 is our eighth annual exhibition of students' work from Teesside University's School of Computing. Once again we are showcasing some excellent work – projects from our final-year students in subjects ranging from advanced software engineering and programming to computer games, music, media and animations.

This brochure is evidence of the outstanding work that our students are able to produce, which is an exemplar to universities worldwide. It is a great credit to our students and to the staff who have taught, enthused and supported them during their studies, that our graduates enter employment with many of the world's leading organisations.

I hope that you enjoy your time at our exhibition – use it as an opportunity to meet our students, and find out more about their wonderful achievements.

Dr Simon Stobart
Dean, School of Computing

ExpoTees 2013

Showcasing the next generation of digital expertise

School of Computing

Inspiring success

BRING THIS
COVER
TO LIFE

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**.

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Teesside University

Where to find our students

Fourth Floor

Third Floor

Second Floor

The key

- Animation & Visual Effects
- Computer Science & Networking
- Games Concept & Design
- Web & Digital Media
- Games & Graphics Programming
- ExpoTees 2013 Awards

What is

ExpoTees 2013

ExpoTees is an exhibition of outstanding computing innovation, technology and design – and an opportunity to recruit bright, new talent to your organisation.

On display is a selection of some of the finest examples of work produced by our final-year students, representing the full spectrum of subjects taught within the School of Computing – animation and visual effects, games design and programming, web and digital media and computer science.

Our students undertake an in-depth exploration of a chosen subject area and demonstrate their ability to research, analyse, synthesise and creatively apply what they have studied. The project is often in an area they have gained an interest in either through a work placement or through their studies. Some student projects have external clients and require project managing to industry standard. These innovative, research, design and development projects make up an exciting and diverse showcase.

We are proud to say that our graduates achieve great success in industry – and sometimes even fame. So this is a superb opportunity to meet our rising stars of 2013 before they embark on their careers.

Find out more about our digital expertise and the range of programmes offered by the School of Computing.

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tees.ac.uk

Welcome

to Darlington campus

We are delighted to hold ExpoTees 2013 at our Darlington campus. Teesside University Darlington is committed to developing, inspiring and empowering individuals to drive forward their careers, supporting businesses to enhance their competitiveness, and delivering real benefits to the region's economy and beyond.

We offer business services to employers, and those thinking of setting up a new business. We help recruit talent, train and develop

workforces, offer access to specialist research expertise and host group meetings, training days, exhibitions and networking events. If you want to further your career we offer a portfolio of part-time professional development courses. We are also committed to being a vibrant part of cultural and community activities in Darlington.

More about our business services: **tees.ac.uk/spark**

More about course and campus information: **tees.ac.uk/darlington**

Friends of ExpoTees

ExpoTees has been running for eight years and has grown in reputation and size with many visitors returning year on year. We are delighted to see previous student exhibitors returning as employers looking for new recruits as in the case of Scott Smallman (see

page 4). We are very proud of our growing community of supporters – join us through our ExpoTees LinkedIn group and meet academics, ExpoTees exhibitors (past and present), and our supporters who have all worked to make ExpoTees a success.

Contents

Aurasma instructions

1. Download the Aurasma app
2. Search for the ExpoTees channel and follow
3. Scan any image with the icon (left) and content will display – all student work images will also play
4. Double tap the screen to view videos full screen

Meet some of our successful graduates

Scott Smallman

Scott graduated from Teesside University with a first-class degree in web and multimedia design and now works as a user experience business analyst for Amplience.

Amplience, with offices in London, Teesside, Germany and US, is a digital company that helps clients create effective brand campaigns and get them out to market quickly. Clients include Marks & Spencer, Morrisons and Shell.

Scott secured his job after impressing industry experts at ExpoTees, where he became the first person to win two awards. 'At ExpoTees I was able to demonstrate my final-year project and dissertation, and was given the opportunity to talk directly to companies about my work. It was my first experience of true networking – it gave me a real understanding of what I needed to do to break into the industry. It opened a gateway that I probably wouldn't have had otherwise.'

Scott and representatives from Amplience are returning to this year's ExpoTees in a bid to recruit more talented final-year students and add to the number of Teesside graduates already working there.

'ExpoTees is a true networking and recruiting opportunity. We have come back because we're impressed with the skillset that Teesside graduates offer – they are extremely eager to broaden their horizons.'

Find out more about Scott's experience at Teesside and Expotees – Scan the image, right, with the Aurasma app, instructions on page 3.

Sarah Parsons

Sarah studied a degree in web design which included a placement year in the new media department for the Disney Channel.

In her final year she won the ExpoTees CBeebies pitch award and undertook a two weeks work experience placement at CBeebies. 'I had a very positive experience at ExpoTees it was a great opportunity for me to display and show my final year project to various companies after many months of hard work.

'Winning the CBeebies pitch award has to be one of my greatest achievements. I entered the competition with the goal to win, really practicing my pitch and making sure I covered all the points outlined in the brief. I was extremely nervous as presenting and public speaking do not come naturally to me, but all the practicing and pitching for my final year project that I was passionate about really paid off.'

Since winning the two weeks work experience Sarah has been part of CBeebies Interactive for over three and a half years, working across different teams and progressing in her career, she is currently a content producer for the website. 'I am very proud to be working for CBeebies and love working here. It's great being part of a team who constantly deliver high quality content with the audience always at the heart.

'It's been great coming back to ExpoTees as a judge for the CBeebies pitch competition. Attending the event allows us to meet so many talented and passionate students who are at the forefront of the latest technology. For the pitch award we look for students who have answered the brief; thinking about the unique selling point, their audience and most importantly are passionate and believe in their idea. Our previous experience of attending the event has been hugely positive.'

Top prize
for talented Teesside foursome

Tom Houseman, Alex Price, Phillip Charles-Sweeting and James Burr recently scooped top prize at the Royal Television Society North East and Border annual awards.

The talented quartet were ExpoTees Award Winners for Short Film and graduated in 2012 with BA (Hons) Computer Animation. They won best student animation for Odd Sok at the Royal Television Society awards – part of their final-year project. Odd Sok was made over several months in Autodesk Maya to reflect the traditional Warner Bros style of animation. It is set in Venice and follows the legend of Sock-Goblin who steal socks in the hope that one day he might acquire the perfect sock.

Phillip, 22, now works at Framestore in London. 'When we started to create the animation there was nothing set in stone – it was quite an organic experience and we just wanted to grow something. To win the award was fantastic – it certainly brightened up my week! Studying at Teesside was a fantastic experience. The course allowed us to develop as animators. We were able to learn from each other as well as from lecturers' expertise which really helped.'

Alex, 22, is now working on his 3D modelling portfolio. 'We weren't sure what to expect from the awards and it was amazing to find out we had won. It's a really symbolic achievement and something extra to add to our CVs.'

Watch Odd Sok – scan the image, right, with the Aurasma app, instructions on page 3.

Teesside University graduates, Tom Houseman and Alex Price

Top business award for Teesside gaming firm

Joanne Noble, ExpoTees Director meets with Kirsten Cummins and Mark South of headline sponsors Double Eleven. (L-R Kirsten Cummins, Marketing Associate Double Eleven, Joanne Noble ExpoTees Director, School of Computing and Mark South Chief of Operations, Double Eleven.)

Double Eleven, ExpoTees lead sponsor and flourishing video games company, headed by a Teesside University graduate has won a leading business award.

Double Eleven has picked up Teesside Company of the Year in the regional heats of the North East Business Awards. Double Eleven, which was founded by software engineers Lee Hutchinson and Matt Shepcar in early 2010 and has grown to more than 40 employees, was among 80 finalists at the black tie ceremony held at Teesside University. The company, now based at Middlesbrough's BoHo One with another office in Leeds, specialises in video game development exclusively for the PlayStation network and has created several games including Frozen Synapse: Tactics and LittleBigPlanet which won TIGA Game of the Year in 2012.

Double Eleven has several Teesside University graduates on its staff, including Chief Executive Officer Lee Hutchinson. The company is a keen supporter of Digital City Innovation at Teesside University which works to generate new businesses and jobs in the digital and creative industries. Double Eleven's Chief of Operations Mark South ran one of the very first companies to come out of the DigitalCity Fellowship scheme – Onisoft. He now sits on one of the boards of DigitalCity Innovation (DCI). He said, 'We feel very humbled to have received this award, having been in competition with leading businesses from more traditional industries. We are proud to be putting the digital sector of Middlesbrough on the map. Teesside's strength has always been in engineering and now we're making it stronger in software engineering, paving the way for a brighter future for the Tees Valley. Our close and continued work with the University allows us to use local talent to do this.'

Double Eleven will now progress to the North East Business Awards final where they will be pitted against the winners from Durham and Wearside and Tyneside and Northumberland. The awards are organised by The Journal and Evening Gazette in association with the North East Chamber of Commerce. The Company of the Year award recognises firms which are characterised by 'excellence in their product or service' and 'the achievement of a strong or growing market share in their chosen niche'.

Evening Gazette editor Chris Styles said, 'The economic outlook remains challenging, which only makes these awards more important than ever. What makes these awards – which are the biggest of their kind anywhere in the UK – so successful, is the strength of the entries.

This year is no exception and our finalists include businesses of all shapes and sizes from a wide variety of sectors.'

Animation & Visual Effects

These projects illustrate the level of expertise of students studying on our 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 gone on to become successful entrepreneurs running their own studios. Our 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.

BA (Hons) Computer Character Animation

SØlve Alexander KjÆrstein
The Stew

For my final-year project I created concept art, 2D animatic and 3D character animation based on my own short story *The Stew*. *The Stew* is about a farmer looking for a carrot in a haunted field. This project is presented in an art journal and on a computer screen showreel. My purpose for this project is to become a better artist and animator. The art journal takes a closer look at the progression from brainstorm sketches to final digital render – it contains the storyboard I created for my animatic. During this progression I explored my characters' personalities by drawing them in various expressions. The artwork was created with pencil sketches, Adobe Photoshop CS5, Adobe Premiere Pro and PaintTool SAI, while the software I used for 3D character animation was Autodesk Maya.

Ivan Jerez and Timon Topke
Escape from Dark Horizon

For our project we chose to produce a sci-fi short in the style of cut scenes in recent games, in near-real-time. An alien convict has escaped from captivity at space prison Dark Horizon, but the guards are alert and in his struggle for freedom he has to overcome many foes. Rather than a game engine we used the latest addition to Autodesk Maya which enabled us to use DirectX 11 shading and many engine-like features. Along with this we combine traditional rendering techniques to enhance the final output, which together form a flexible, fast-paced computer-generated workflow. The characters are driven by motion capture combined with key frame animation, taking advantage of the HumanIK feature in Autodesk Maya. We split the overall workload between us into characters and environment allowing us to focus on our individual skills.

Xin Zhao and Florent Rubio
The Answer

The Answer is a short film about a man trying to get rid of his half-shaved beard after his razor breaks while preparing for a date. After trying everything he can think of, the solution appears to him after reading a mysterious book called *The Answer*. Our focus was to create high-quality 3D character animation. The software we used for this short was Autodesk Maya, Mental Ray, Nuke and Adobe After Effects.

Amanda Mongan
Character animation showreel

The bulk of my project is a comical short character animation about a squirrel's ordeal as he tackles a circus-themed obstacle course to obtain an enormous jar of peanut butter. However, he collapses, exhausted, just feet from the prize. As it turns out, so have many other contestants. I chose the obstacle course theme to challenge myself with a series of complicated actions. Alongside this I worked on several shorter character animations, ranging from a realistic animal animation to a mad scientist brandishing his newly created ray gun. I used a variety of software to produce these animations including Autodesk Maya, Adobe Photoshop, Nuke and Adobe After Effects.
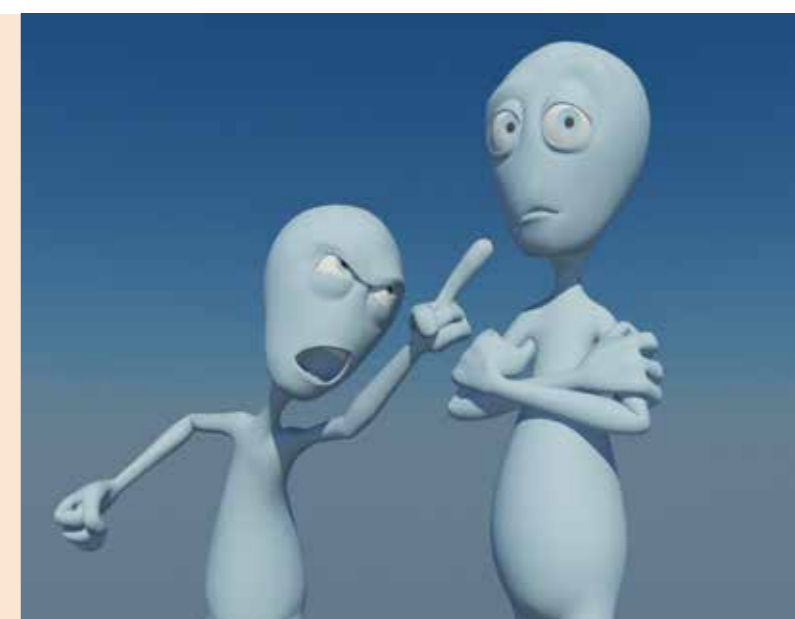

Hannah Pretswell
The Art of Exodus

Exodus is a comic set in a parallel universe on the planet, Terra, five hundred years after a comet destroyed the world and forced all of humanity underground. The story follows four comrades, who in an attempt to better the world with mechanical prosthetic limbs, have accidentally triggered the second apocalypse through the creation of zombie cyborgs. Their journey takes them through every district of Atlancia and up onto the lifeless lands of The Surface in a desperate attempt to find a cure to stop the complete wipe out of humanity. *The art of Exodus* contains concept art for characters and environments for the comic.

Andreas MÅren Stende
Yes Satan?

This is a short 3D animated film created in Autodesk 3ds Max and Adobe Premiere. It is based on a sound sample from the film *Ace Ventura: Pet Detective*. This is not a visualisation of the movie itself – it is my own planned out version with the same audio track. It starts with Ace Ventura walking towards his apartment in a hallway when suddenly the landlord confronts Ace about unpaid rent. Ace ensures him that he will be paid as soon as he finishes a certain job. The landlord is convinced that there are animals in the apartment, but Ace denies it. There is only one problem – Ace brought pet food with him.

Josh Kubik
A study into character animation

My final-year project demonstrates the practice of 3D character animation. It has two scenes side by side so you can see action and reaction alongside each other. The story involves a man who has found some luxury items while returning from a long expedition and a podcast interviewer talking about the scene unfolding. The audio clip is from the podcast which also overlays the sound from the original YouTube video. I used pre-made rigs as it gave me the best opportunity to showcase my animating skills.

Laura Louise Bell
Super Old

I have created a concept art bible for an idea that could be developed further into a TV or online series. The idea is about a group of elderly supernaturals that live in a retirement home built especially for supernatural beings. I looked at how big studios such as Disney and Pixar create and develop their characters and their different styles and exploration before settling on their main design – I used this in my development stage of the project. The software I used was Adobe Photoshop and Sketchbook Pro.

Ole Daniel Aarnes
Ravenheart – quest of fire

Ravenheart is a cinematic game trailer about three heroes ambushed in the night and confronted with a dark and powerful warrior. The trailer shows that even though the heroes have very different personalities they stand together against a common threat. The heroes represent the playable characters confronted with the evil within the game from the trailer. I used Autodesk 3ds Max for modelling, rigging and animation, Autodesk Maya for particle fluids, Autodesk Adobe Photoshop for creating textures and Autodesk Adobe Premiere Pro and Adobe After Effects for video editing and final compositing.

Jonathan Parkin
At the Door

My work is a short 2D animation about a beetle driven to insanity through persistent knocking at his door. My aim was to create a surreal world with dark humour and a twisted animation style. I also wanted to show a clear split between calm and crazy, taking inspiration from Ren & Stimpy and the Loony Tunes short films. I chose this style as it's really fun to work in with endless possibilities; it also plays into my passion for character animation and the strange. It is entirely 2D using Adobe Photoshop and Toon Boom Studios. Now you'll have to excuse me, there is knocking at my door...
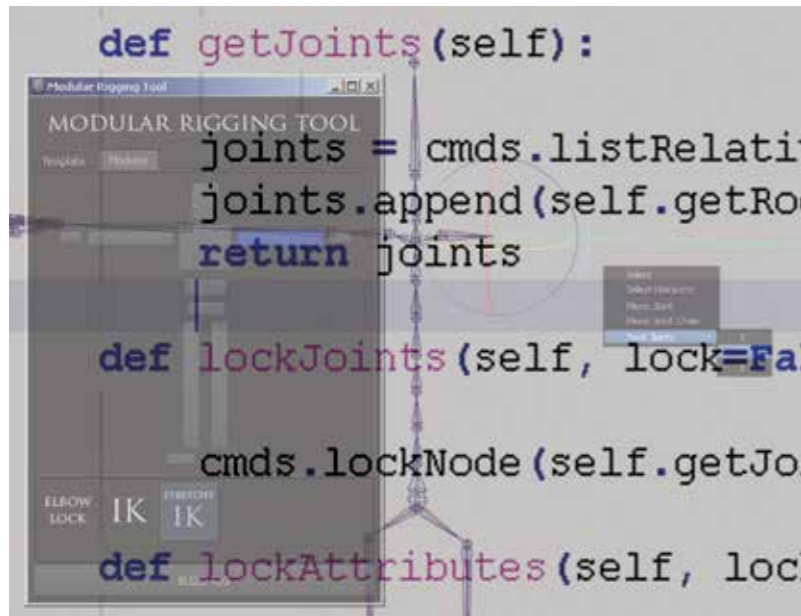

Mats Bauge
The Norwegian Samurai

I have animated a short film about a very dedicated and honourable Samurai sent from Japan to the snow covered valleys of Norway to protect a young, mischievous noble girl named Alva. The animation's visuals, characters and environment, inspired by Norwegian and Japanese culture, are a hybrid of the two. I used ZBrush and Autodesk 3ds Max for the modelling, environment and animation, Adobe Photoshop and Adobe Illustrator for texture and Adobe After Effects and Adobe Premiere for post-production and editing.

Emily Raw
Live action short film

Stanley Kubrick once said, 'The screen has such power that it can retain interest as it conveys emotions and moods that no other art form can hope to tackle.' This quote and his work inspired me to make a live action short film for my final-year project which works on the themes of trust, fear and love. Taking influence and learning from my favourite directors, Jacques Audiard and Stanley Kubrick, I directed the actors, wrote the script, produced the film and baked cakes for my friends who helped. To create the film I used a Canon MK-II to record the video, a H4n to record the sound and studio lights, and reflectors to achieve the correct lighting. To edit and colour correct the film I used Adobe Premiere and Adobe After Effects.

Matthew Lefevre
Modular rigging tool for Autodesk Maya

I used the programming language Python to create a rigging tool to automate the production of bipedal character rigs. It provides 3D artists with only a basic knowledge of rigging to build complex yet animator friendly rigs. The tool also serves as a framework for technical artists that want to expand on or upgrade the provided library of rigging modules.
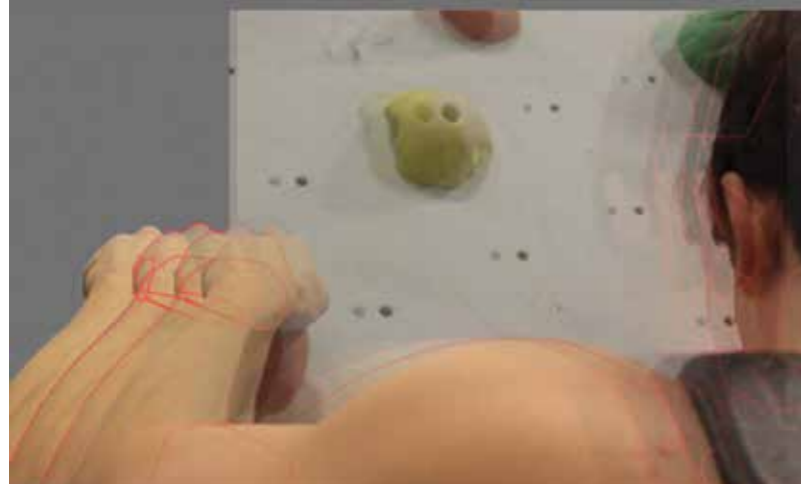
Jake Alexander Tench
The Reality

The Reality is a 3D animation set in a 1950s hospital ward. The story is shown through multiple key poses of Lily and her father through moving camera sequences. In dark and dire situations a child imagines themselves in a fantasy scenario, which I portrayed as a metaphorical bubble. The story shows Lily reliving her past, through this bubble, to see her father once again. I used Autodesk Maya for the base meshes of all the assets and characters within the scene. I then took each model into ZBrush to add textures and detail. The final render passes were then taken into Adobe After Effects for the post-production and compositing process

BA (Hons) Computer Animation

Joshua Dowsett
Environment portfolio

My final-year project is a portfolio of environments which include still images and animated scenes using a variety of methods of painting, modelling and compositing to create matte paintings, 3D built landscapes and sets with high-quality texturing. The largest computer-generated environment is a steampunk/Renaissance-style city with an enormous robot built out of clockwork pieces resting on the buildings. Autodesk Maya, Adobe Photoshop, Mari and Nuke were all used to create the computer-generated landscapes. For the matte paintings I used Adobe Photoshop to composite the photos together, and painted textures and colour on top. The landscapes were moved into Nuke to add background animation and camera movement.

Ben Nightingale
The Occupied Space

For my project I created a short stop-motion animation based on my experience at university. The film focuses on four first-year students deciding on which movie to watch. The film takes place in my friend's old dorm room, which we affectionately named The Occupied Space. The four characters discuss a wide range of popular culture before settling on a particular movie they would all like to see. I chose this scenario because of how often I find myself in this situation. The piece was created with practical props and characters in a miniature room, using classic stop-motion techniques. Each frame was photographed with a camera and put together using Adobe After Effects. I also created a 3D environment model in Autodesk Maya. Everything on screen was created by hand.

Tord Tonnesen
A try on compositing

I have produced a showreel for compositing and visual effects. The project is based heavily on research to figure out which techniques would be the best to include for a future career in the visual effects industry. The prime focus of the project was as a learning and improvement experience to prepare myself for entering the industry. For the project I have used Autodesk Maya for the simulations and 3D modelling and animation, Nuke for the compositing, and Boujou for 3D tracking. Part of the project was to familiarise myself with simulations in Autodesk Maya and learning Boujou, identifying if it was suited to the task.

Sana Jamie
A creative and technical exploration of compositing

I explored VFX production pipelines and employed the principal techniques to create a series of visual effects shots. After designing and visualising my shots through concept art, I acquired live action footage as base plates and heavily manipulated and worked into them using techniques such as matte painting, rotoscoping, compositing, colour grading, removing unwanted elements and 3D modelling to achieve the final pieces. It was important to me that I was simulating particles and painting them to be realistic and physically accurate, and also producing stylised pieces with direction and narrative. One is set in the old Wild West, at the dusty and forgotten train station by the Dry Ditch Mine. The other set deep in the forest, plant life teeming by a calm river. To design and produce my project I used Adobe Photoshop, Autodesk Maya and NukeX.

Gabriela Mursch
VFX showreel

My final-year project was about acquiring the skills of a VFX artist. I have gained experience in some of these skills during my job as a runner at Double Negative. For the project I shot live action footage, including a lot of reference photos and high dynamic range imaging, then tracked it and created the environment in 3D space. While working on the footage, I researched which software to use for the effects. Initially I wanted to do all the effects in Houdini but ended up using Autodesk Maya as well. I have focused mostly on particle effects in this project and explored Maya embedded language scripting.

Timothy Mubaiwa
Silent Town

My project is a 3D animation short that showcases my skills in creating high-quality 3D assets. It features a lone rider coming into what seems to be a deserted town. The lone rider walks into a saloon and heads for the bar – everyone in the bar seems frozen except for the bartender. He buys himself a drink and as soon as the cup touches his lips everything freezes except for the camera which pans around the lone rider's face. When the camera stops panning, everything in the bar starts moving and returns to real-time motion. I chose the bullet time effect because of my interest in the techniques used to create it in 3D animation.

Robert McDougal
Alley Encounter

I have produced a visual effects movie, *Alley Encounter* about an everyday man trying to get home from work. But to his confusion, he is continually attacked by a woman who seems to be out to assassinate him. Luckily he knows the way of the sword. *Alley Encounter* tested my skills in new ways. I have a live action short with visual effects to push my boundaries in tracking and rotoscope – the areas I need to focus on to apply myself to the industry. I have used a mixture of software packages including Autodesk Maya for 3D assets and Boujou for 3D camera tracking. I used NukeX to composite the footage together, topping off any extra motion graphics with Adobe After Effects.

Scott Richard Anderson
Digital matte painting

My project explores and further understands the niche role of a digital matte painter. It's a similar role to a concept artist but matte painting is a post-production tool that combines elements from different mediums to create photo-realistic background plates for films, games and commercials. The project delves into the workflow and thought process behind creating these paintings.

Daniel Jacobsen
Particle goodness

My project is all about the beauty of particles and fluids. I have made a series of computer generated shots, designed to look beautiful and further my technical knowledge of the programs. I have tried to design the shots so that they blend in to a standalone piece of art that I can use as a reel to showcase my talents as an artist. I used a variety of programs and scripts including Autodesk 3ds Max, FumeFX, Krakatoa, RealFlow, Nuke and Adobe After Effects.

Niall Walsh
The Motel Exchange

I have produced a short animation based in the 1950s set in a cheap rundown motel room. It becomes apparent that there was meant to be an exchange of money between two people, and the motel room is trashed in their struggle. I have captured the moment where the victim makes impact with the motel window – shards of glass are flying through the air to create a visually impressive look. My objective was to display my modelling, sculpting and texturing abilities through a freeze-frame animation, taking inspiration from the style of Quentin Tarantino films, *The Godfather* and others in that era. I did extensive research to ensure that my animation was as accurate as possible, and took inspiration from other films including *Watchmen* and *Nuit Blanche*. I also had to research current modelling and texturing workflows for the characters and environments, Interactive Creative Environment and Autodesk Maya fluids, Mental Ray rendering, and compositing techniques with Nuke. The animation was created using Autodesk SoftImage, Autodesk Maya, ZBrush, Adobe Photoshop, TopoGun and Nuke.

BA (Hons) Creative Digital Media

Daniel Röhl
Chime

For this project I looked further into the process of developing characters and environments from concept to fully realised 3D models. I wanted to create my own approach to the elements of fire and wind as human incarnations set in an environment fitting a clash between these two elements. I used ZBrush and Autodesk 3ds Max to develop the 3D models, and the concepts were made using Adobe Photoshop.

Erik Nicolaj Fjellberg
Project Restless City

Project Restless City is a short computer-generated animation video with focus on particle effects, real lighting and high-quality rendering. It shows the power and quality of simulating particles. The story is about a car being crashed by a huge tsunami at midday, wrecking and destroying everything in its path. The modelling, lighting and animation was done in Autodesk 3ds Max. The particle effects were created in Houdini, which was a new skill for me.

Haakon Stiksrud Helmen
Developing a story

In this project I've written and developed a story for a short animation film. I have gone through all the stages of a typical pre-production for an animated film and ended up with something that is ready to be picked up and produced. A production bible clearly shows the vision for the film which includes a treatment, outline, storyboard, mood boards and finished 3D models.

Computer Science & Networking

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.
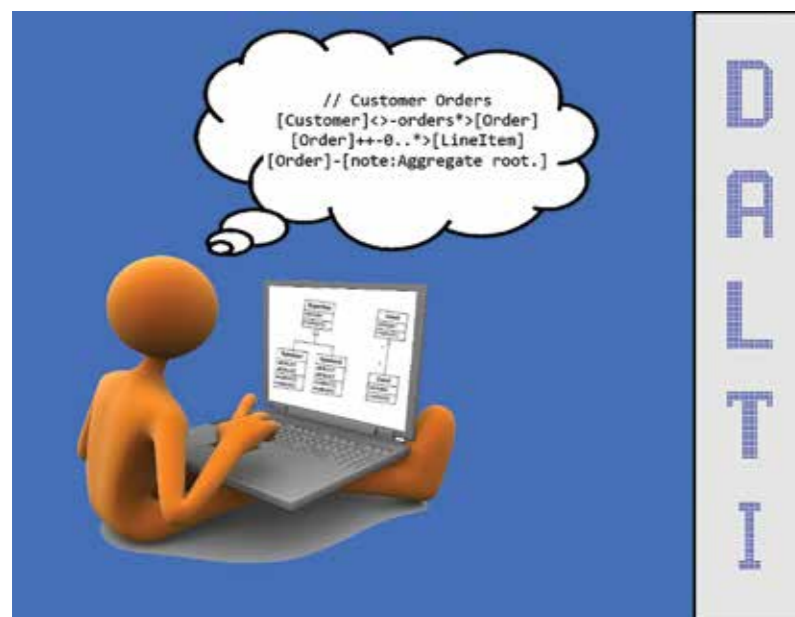
BSc (Hons) Software Development

Iain Batty
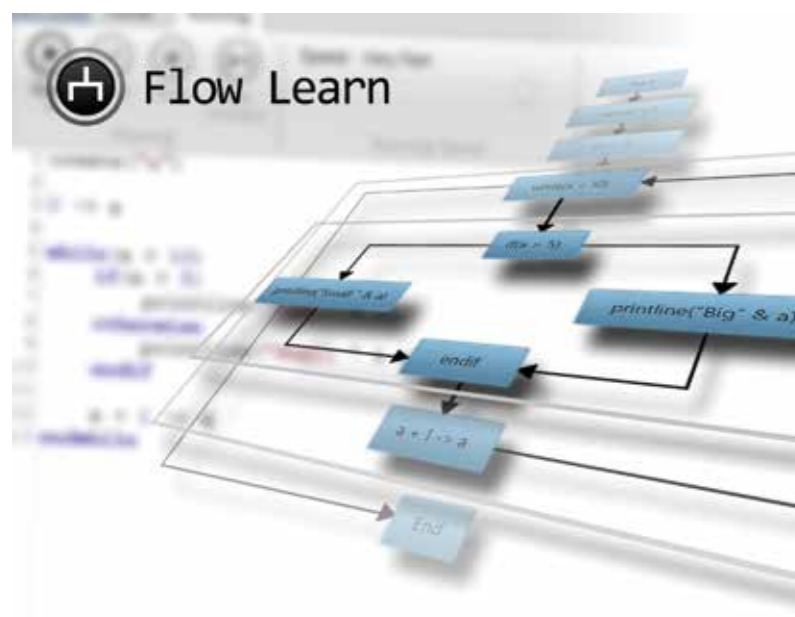**Intelligent distributed computing within a dynamic networked environment**

I have developed a suite of C#.Net applications that allow an organisation to use its networked IT infrastructure as a distributed computing platform. Developed to allow easy interoperability with Microsoft .Net applications, the project consists of a client installed on every networked PC, a server maintaining the entire computing cluster and an application programming interface that allows distributed tasks that can pause, resume and collaborate with tasks on other client nodes to complete a processor intensive operation. When a task is submitted to the server, it is distributed to a client node that has the required computing resources and isn't in use. If someone logs in, the server will automatically migrate the task to another client and seamlessly resume its operation. The suite also allows developers to encrypt the traffic of both their tasks and client/server communications, and can use an account-based system to prioritise and authenticate task submissions. To create and debug this project I used Microsoft Visual Studio 2012, as well as Arch Linux and Oracle VirtualBox to test it in a networked virtual environment.

Andrew James Belson
DALTI: Diagramming with automatic layout and text input

My application is capable of arranging diagrams neatly and professionally along with an optional textual notation method of inputting the detail of the diagram. An algorithm determines the layout calculating co-ordinates for each item on the diagram. This is quite a complex algorithm – the complexity is almost exponentially linked to the number of objects present within the diagram. Diagrams can be exported as images to use in other programs and include in documentation. The textual notation uses the human usable textual notation as defined by the Object Modelling Group to ensure that any textual notation is fully readable and understandable by a human as well as machine readable. I have done this to suit different users' needs and potentially save time when inputting detail. Each type of diagram is implemented using a plug-in system to ensure only the required functionality is installed for the user. I used Visual Studio 2012 to create my application utilising C#.Net and XAML by using Windows Presentation Foundation. My motivation came from creating large diagrams using drag and drop tools, and the difficultly in laying out the diagram to not look like a spider's web.

BSc (Hons) Computer Science

Liam Scott Russell
Creating a usable educational programming language for entry-level programmers

My project helps students studying for their computer science GCSE, by providing a simple programming language aimed at novice programmers along with an assistive integrated development environment. The language is designed to be as simple as possible, making it highly readable, removing the initial language barrier found in more complex programming languages. The development environment scans the code, and in real time, generates a diagram to illustrate the program flow step by step. Alongside the code visualisation, plug-ins can be written to extend the base functionality, providing a way of creating interesting tutorials. Both parts of the project have been written in C#.Net, with the user interface using the features of Windows Presentation Foundation.
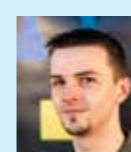
Michael David Sharp
MapWork – the cloud-based 2D map editing solution for the modern game developer

I have created a web application for editing 2D tile maps for games. Aimed at budding hobbyists and independent game developers, the tool offers a robust and user-friendly environment for composing and editing multi-layered tile maps for game projects, removing the need for developers spending valuable time building their own, in-house editors. The tool is built using modern standards compliant web technologies, using the HTML5 canvas element and JavaScript programming language. User account management is delivered through use of the ASP.NET MVC framework and user data is stored in a MySQL database.
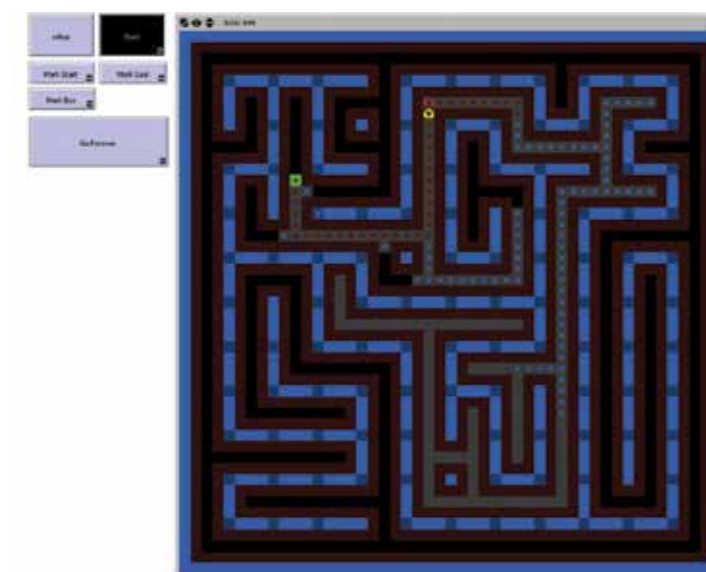
Garry Willis
Autonomous problem solving in the real world

My project explores the difficulties of programming autonomous agents in a real-world environment. The problem domain involves a randomly generated maze in which an agent autonomously navigates and solves a simple puzzle – pushing an object around the maze. A virtual system was created to demonstrate that a solution exists, followed by an exploration into the difficulties in implementing such a system in a real-world environment. The virtual system was created using an agent-based software development environment (NetLogo) and the physical system experiments were performed on Lego Mindstorm robots.

Adam Hindmarsh
Sabisu mobile – a HTML5 platform; operational intelligence anywhere

My project is a live project for the Argent & Waugh platform Sabisu and consists of a HTML5 web application which is a mobile, small-device-format implementation of the Sabisu platform (www.sabisu.co). The application has a rich, dynamic and optimised user interface, designed to be generic and efficient across all platforms. Sabisu is an enterprise platform which is used in the petrochemical and manufacturing sectors to deliver real-time business statistics and analysis. Currently Sabisu is not optimised for mobile devices and doesn't have a responsive layout – the mobile web application maintains the richness of the large format platform and provides all of the core functions of the Sabisu platform. The completed web application will interact with the live Sabisu database and provide real-time updates to any user with an internet connection. The application uses C#, HTML5, CSS3 and JavaScript/JQuery ensuring that the platform is future proof and at the cutting edge of technology.

Steven Andrew Heasman
U-Trade: E-commerce business management

When an existing business looks at creating a new platform for selling its products e-commerce is a very good way ahead. Unfortunately it is not cheap and you can't guarantee that it will generate business. U-Trade's primary function is to help this scenario. It is designed to help improve the performance of your online store at the same time as minimising the cost and risks. The U-Trade platform is intuitive and will help manage your online business with very little set-up and complications.

Philip Rhodes
Mobile business information – using augmented reality

My project came from Sabisu after my industrial placement there. They wanted me to develop a means of displaying business information on mobile platforms such as smart phones and tablets in real time using augmented reality, which they can integrate into their platform (also called Sabisu). I did this by using a HTML5, C#.NET and JavaScript frontend (including the JQuery mobile library and Google maps integration), a SQL Server database to store data and C#.NET web service to query the database from the client. Users can geotag locations and configure the tag to execute a query – when you look at a tag this will be executed, displaying information onto the mobile device over the camera.

BSc (Hons) Computing

James Dickinson
Wireless security

This research project looks at wireless security in its many forms and devices in use – from laptops to mobile phones. The aim was to develop an overview of what is currently on the market and how secure these devices really are, especially when using them in public places. I wanted to expose the current misunderstandings on wireless security, and the vulnerabilities faced on a daily routine by any wireless device. And also to develop my own understanding of the wireless security, its weaknesses and how these can be addressed.

Jonathon Albert
Generating real-time cloud simulations on limited capability devices

As clouds are often generated using textures in game environments, I wanted to implement a way that would allow 3D clouds to be rendered in real time. For my project, I have created an application for limited hardware devices that simulates realistic cloud formations. The objective was to investigate whether clouds can be made to look realistic while leaving enough central processing unit usage for a game. The clouds themselves are generated using atmospheric fluid dynamics – the shape, size and density of the clouds can be changed through a user interface. The application was developed in Objective-C using the open source ISGL3D library for graphics. I used the Xcode IDE for programming as well as the instruments software for profiling.

Matthew Collins
Insto – real-time, real easy

I have created a cloud-based service providing web developers with the ability to add authentic real-time features into web applications through a simple JavaScript application programming interface. Think push notifications, but in your browser. The application programming interface uses the HTML5 WebSockets standard to communicate with other users in real-time through a hosted server written in node.js. A simple querying system is available to make sure notifications go where they are supposed to and the whole thing even degrades to support users with older browsers that don't support WebSockets. The service uses node.js to create the application programming interface and to act as the WebSocket server, with Redis providing scalability through its in-memory storage, and publish and subscribe technology. Application programming interface users are managed in a CouchDB database, with signups coming via a PHP-based website which includes documentation and interactive examples. Everything is hosted in the cloud on the Amazon Elastic Compute Cloud cluster to allow reactive scaling of the service to meet demand as and when required (www.insto.co.uk).

Sara Watson
A mobile travel guide application for android

I have created a Japanese travel guide application to show the benefits of mobile application technology when travelling to a foreign country. After a recent trip I was surprised to discover that applications in this area were limited. Many were available for hotel bookings and flights, and there were several dictionaries for language – but none offered a comprehensive package of information like a travel guide. This is something that could have greatly benefited my travel experience. This travel guide is a hybrid Android application built in HTML5, offering navigation in form of a global positioning system, language support, tourist information before and during travel, and other information of benefit to a western traveller in Japan. This has been developed for the mobile phone as one item of technology that tends to travel anywhere with us.

Daniel Frank Weatherley
Web development tool

My project was to design and implement an online tool to help speed up the process of web development and help users organise repeatable code. Users can store snippets of code on their account, then go to the editor and input a simple set of instructions to merge the snippets together into a downloadable project. It was designed with both individual and group projects in mind. My objectives were to produce something that would assist me on freelance projects, while also getting a chance to improve my PHP skills, and further develop my knowledge web security, databases and string handling methods.

David Richard Norman
Bring your own device – mitigating the risks

I have developed a workflow and information pack based around the information technology infrastructure library (ITIL) framework, to allow small and medium companies to analyse whether a bring-your-own device policy is right for their organisation. The pack also guides planning, for compliance and regulatory issues that may stop the project in its tracks. The project came from my previous industry experiences of staff wanting to use their own devices in the corporate environment, and the issues this raised in a traditional IT environment. I have tried to make the end product structured within the ITIL framework but not so regimented that it can't be adapted to an end user's needs.

BSc (Hons) Computer Networks

Paul Eaglen
The governance of cloud computing

For my project I looked at existing governance for cloud computing and, if there was none, what needed to be implemented. I chose this project because I kept hearing the words 'cloud computing' and 'big data' more and more and I started thinking... given the vast amounts of data and companies around the globe throwing cloud services to everyone and anyone, why is everyone so happy to put all important and/or confidential data into a cloud? Also with different laws in different countries and servers spread across the world, how would the cross-border legislation affect a person or company's stored data if it were to go missing, get damaged or be used for criminal means? To answer these questions I made contact with the Home Office as well as researching academic journals, conferences, printed and online literature and attending webinars.

BSc (Hons) Business Systems Design

Harry Stefan Schilbach
Stockify.me – cloud stock management software

Working in a warehouse environment while studying I noticed how organisations struggled with stock management systems. Current solutions for small and medium enterprises tend to be expensive, overly complicated or proprietary – and sometimes all three. I wanted to prototype a system that would be simple and intuitive to use, to give the system away for free with open-source code to allow others to develop it further. An imagined business model for the product may involve charging for consulting services around the installation or developing custom version of the development. I have also developed a web-based interface so small and medium enterprises can use it as a software-as-a-service product, further simplifying stock management by keeping their data in a secure cloud accessible everywhere. Technologies I employed include SQL, .Net framework and HTML.
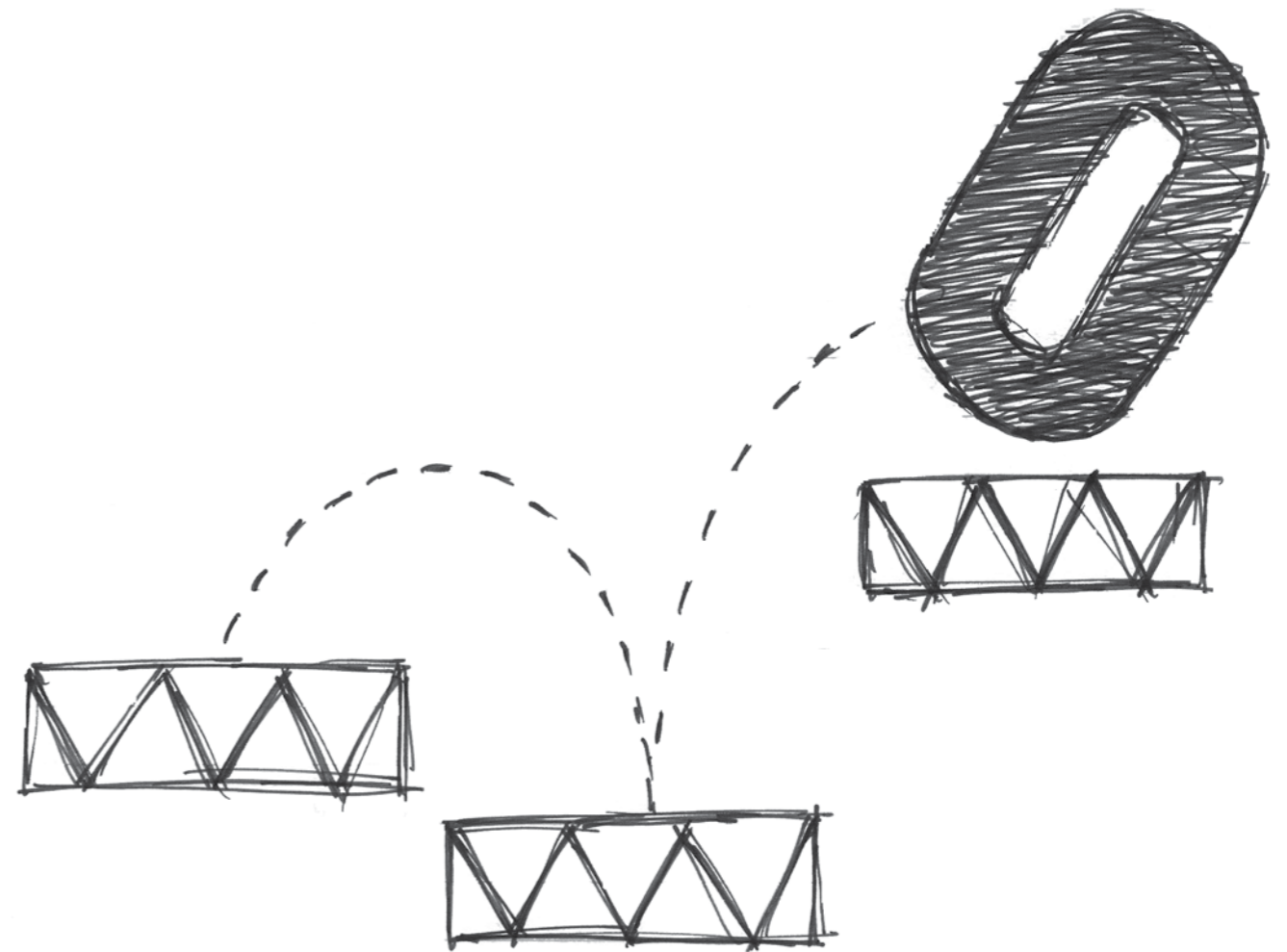
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Games Concept & Design

The birth of a computer game occurs within the imagination. The concept, environment and characters that inhabit that world and subsequently interact through game play, the game play structure and level design are all represented at ExpoTees. These projects reflect work in games such as storyboarding, interface design and level design.
We're very proud of our graduates who can now be found at many of the leading games companies around the world.

BA (Hons) Music and Computer Games Design

Mark Raymond Clough
Sound design for existing intellectual property (Dead Space)

I have created a 12-minute audio replacement for the game Dead Space. The clip begins with an introductory cut scene and transitions into the initial gameplay segment. The project demonstrates my skillset as a sound designer capable of working on a project or brief of any scope. The audio is often the last part of the process when creating a videogame – I wanted to convey how sound can make a great impact on a project. The original audio for this clip was already of a high standard. I was really inspired by this and wanted to pay homage to the original audio team. A game was used here, but the same techniques apply to a film or an animation. I used a wide range of techniques and tools including audio recording in Pro Tools and Steinberg Cubase 7, as well as synthesis techniques using virtual instruments from Native Instruments. This includes building soundscapes in Absynth 5 and FM8, using Battery 3 drum sampler to synthesize footsteps and Massive, Reaktor 5 and Kontakt 5.

Philip Ward
Clean, efficient level design practices

My project explores ways of streamlining and enhancing the process of designing levels. Using a series of levels from two different genres, I wanted to explore how possible it was to create them quickly, cleanly and if need be, change them as required. Throughout my experience as a level designer I have had to contend and deal with the fact that my level will look plain and sparsely populated until the art team completes the assets. To help overcome this issue I've created a type of place holder art that will stay in place until the art team is ready – this makes the level look better and more directed earlier in the process. I have devised the following workflow: create a texture map in Adobe Photoshop, export to Autodesk 3ds Max and create all the modular assets, export those assets into the Unreal Development Kit, finally create the scene.

BA (Hons) Computer Games Design

Sara Galea
Copy/Cut/Paste

For my final-year project I have created a prototype for a mobile game, Copy/Cut/Paste. The game is a 2D puzzle platformer. As the name suggests the gameplay revolves around copying, cutting and pasting tiles. The player has to use these mechanics to solve puzzles and escape enemies. I decided to work on a mobile game to become familiar with developing for this new growing games platform, for the challenge of creating intuitive gameplay using a new form of input and for the opportunity to reach a larger audience. Before starting work on my project I researched game engines that can export to mobile devices. I chose GameMaker: Studio – it's user-friendly, well documented and has a vibrant community. This allowed me to quickly build and test my mechanics giving me more time to spend on game design and asset production. I created my design document in Adobe Illustrator and also used it for my artwork. In some cases I started with hand-drawn sketches which I coloured in digitally.

Paris Stalker
Forgetting & Forgotten – a game about dementia

It is not often that conditions of the mind are thoroughly explored in games. I have created a small game experience centring on the playable character's dementia. Focusing on design, using mechanics as metaphor, I aimed to create an atmospheric mindscape for our silent protagonist and inquisitive players to wander. Every area represents a time in the afflicted person's life, as well as an aspect of dementia. I created all the game design, soundtrack, animated overlays and 3D assets. The world and its gameplay were compiled in the Unreal Development Kit, while Adobe Photoshop, Adobe Flash and Autodesk 3ds Max were used to create assets and GFX movies. I used Sony ACID Pro to create the sounds and music.

Thomas Parrott
Bleak Ground: designing a game and complementing character creation process

The basis of my project was to explore the relationship between the character creation process of games and the games themselves. I decided to produce a game level and character creator using models I created myself as an experiment into ways the character creation process can extend into gameplay. The premise behind this idea was to produce a game environment that users can interact with in different ways, depending on their choices in the character creation section of the game, to provide a unique experience for each player and each play-through. This project was designed to practice and further my skills as a designer and artist, and to gain a greater understanding of all aspects of computer game production.

Erling Fangel Belsvik
Archery game

I have created an archery game with semi-realistic physics. The game is set in a small archery range with shooting targets where users can configure the range they want to shoot. I have created a character controller which enables players to move about with the bow, as players would in a first-person shooter game, and use stamina to charge up each shot. The game was created in Unity3D game engine. The end product is a game prototype with a complete design, but limited polish due to the time limit.
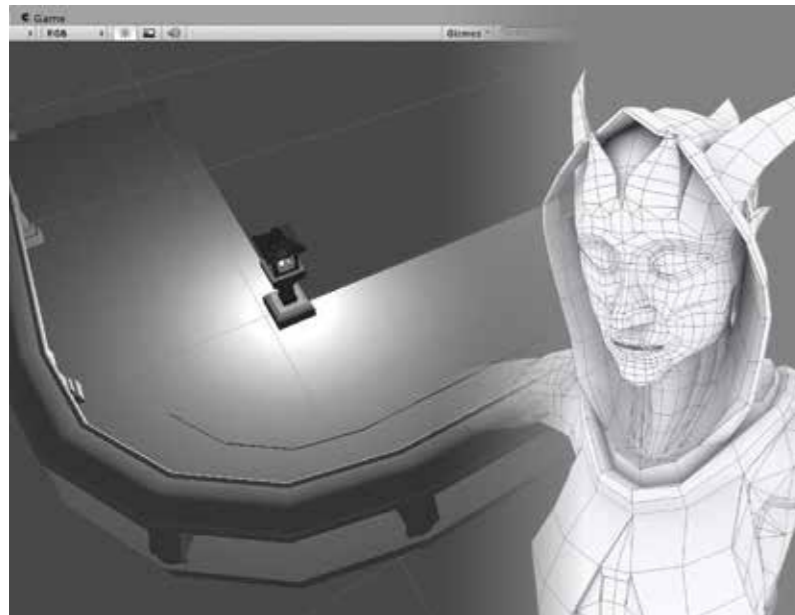
Robert James Doughty
Game design, *Aisle 3*

I have made a one-level game, in which the player must escape a supermarket. The problem? A vampire blocks the exit. Prepare for the fight for life or just go for it – which will you choose? I wanted to make a level set in an everyday location that people often frequent to give the players the feeling that they know where to go for what they need, without designing the level to be bottlenecked and forcing the playing down a single route. I made the level using a mixture of the Unreal Development Kit for the engine and scripting, Autodesk 3ds Max for the assets, Adobe Flash for the heads-up display and interface, and Adobe Photoshop for the materials for the assets, heads-up display and interface. Sounds and some assets are from outsources (credit to makers can be found in the credits page).

Magnus Torsvoll Midthun
Master controller

I have developed a grid-based puzzle game for the PC. The player in this game has a master controller to move multiple mechanical units – their job is to guide a certain unit through the levels. I chose this project to improve my skills in game and level design. I wanted to take the opportunity to develop a better grasp of the different aspects video game production, so that I may work well with colleagues with different areas of expertise. I have used Autodesk 3ds Max for modelling, Adobe Photoshop for concepts and texturing, Adobe Flash for the interface and the Unreal Development Kit for the game engine and visual scripting.

Aidan Thomas Jennings
Prototyping and development for small teams

This project is a concept for a game that could be built by a small team such as an independent production company over a short period. The main aim is laying the groundwork for a project with minimal financial risk for a first-time studio as well as requiring only a small team of developers with less experience. To help with the development the game is designed to start small and grow over time, similar to the approach taken by many recent successful first-time and independent developers. The game demo is created using the free Unity game engine utilising C# scripts, with Autodesk 3ds Max and Adobe Photoshop used for the art both in and out of game.

Ben Cook
A Fun Game of Paper

A Fun Game of Paper is a 2.5D side scrolling platform game. The player takes the role of a paper craft character plunged into a world of dioramas where the player, as all players should, pushes back the darkness that has corrupted them. This game features a simplistic art style, a little humour and an easy-to-learn crafting system. This forms the artefact for my study of what makes a fun platform game. Assets are created using Autodesk 3ds Max, and built in Unity3D with JavaScript.
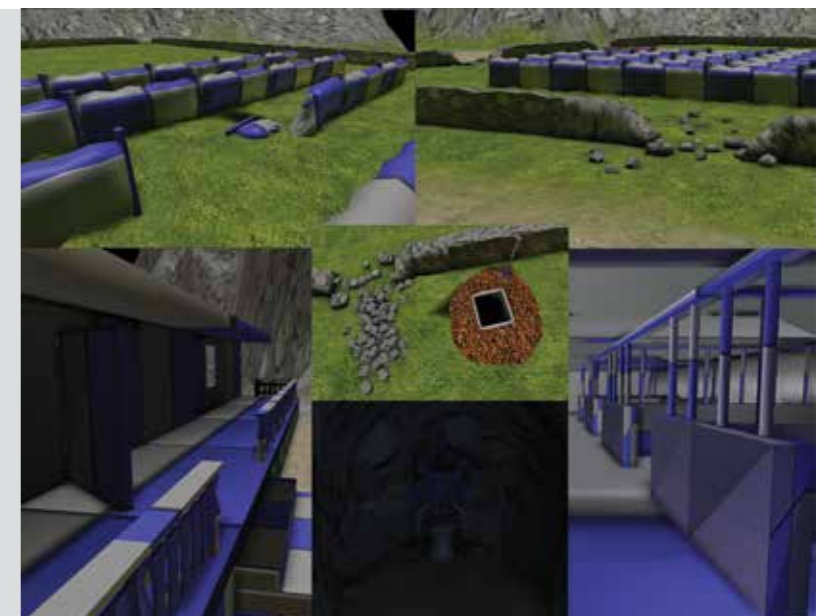

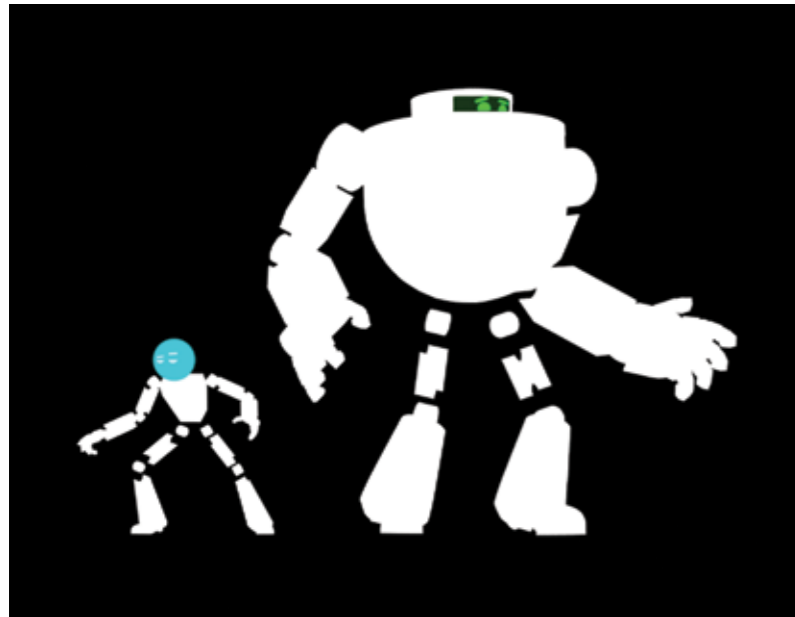

Jordan Quigley
Orb: An unreal showcase

The goal of my project was to create two environments using Unreal Engine 3. Too often I see areas of gameplay in games that seem needlessly out of place or unbelievable. Throughout the production I concentrated on the visual aesthetics of the levels and combined this with simple complementary gameplay, focusing on simple objectives and flowing environments. The orb concept revolves around the idea that the game world is controlled and sustained by these mystical orbs that maintain balance and order, but they have escaped and must be collected. I decided to use only pre-made game assets so I could concentrate on building attractive environments while challenging my imagination and versatility.

Ruben Gjerstad Eide
Games design

For my final-year project I have created a 3D game level. I have always found the road to a good level fun and interesting, and so I decided to walk the path myself. My level is set on an old farm where the map tells the story without taking control away from the player. It is an immersive and interesting map, as well as visually pleasing. I used Autodesk 3ds Max to demonstrate my modelling skills, and UnrealEd to put the level together.

BA (Hons) Computer Games Animation

Isaac Fargher
Search and Rescue

Search and Rescue is a 3D animated short film about two robots completing the first part of a series of challenges inside a production facility. Nearing the end of their ordeal, after having passed the more physical tests, Search and Rescue might have finally met their match – public relations. Search is intelligent, stubborn and believes he can take on anything the world throws at him, while Rescue is a gentle giant who is always thinking about the wellbeing of others. My short film has been developed using Autodesk 3ds Max for the models, rigging and animation, Adobe Photoshop for the textures and storyboards, and Adobe Premiere for editing and rendering.

Abigail Roebuck
The Chase

The Chase is a 3D in-game cut scene that happens right after the player has defeated a boss battle. Our four main characters are being chased by a horde of skeletons. Zander, the main hero, stays behind to fight the skeletons while the others cross a bridge which is then destroyed. In the distance the enemy boss is up and charging towards Zander. Once Zander defeats the last skeleton he runs towards the bridge – just as he's about to jump, the enemy hits his leg with fire making him fall down to the river. But he manages to thrust his sword into the opposite mountain and dangles there while his companion throws rocks down at him for scaring her. An action-packed cut scene which is fun, emotional and a good chance for me to show my skills as an animator – it is all hand animated. Software used was Autodesk 3ds Max, Adobe After Effects, Adobe Photoshop and Audacity.

Richard Tongeman
Lifeline: interactive fiction through animation

This project demonstrates how narration and animation can have an effect on an audience through the medium of a modern 3D adventure game. This is a playable proof of concept based on an intriguing storyline from renowned comic book series, *The Walking Dead*. It explores an alternative side to a character well engrained into popular culture. I have used my animation skills and knowledge of the Unreal Development Kit to create an enthralling experience constructed to gain an understanding of current industry practices. During the project I developed a deeper understanding of my role as a games animator and the ever-expanding skillsets required of a modern developer.

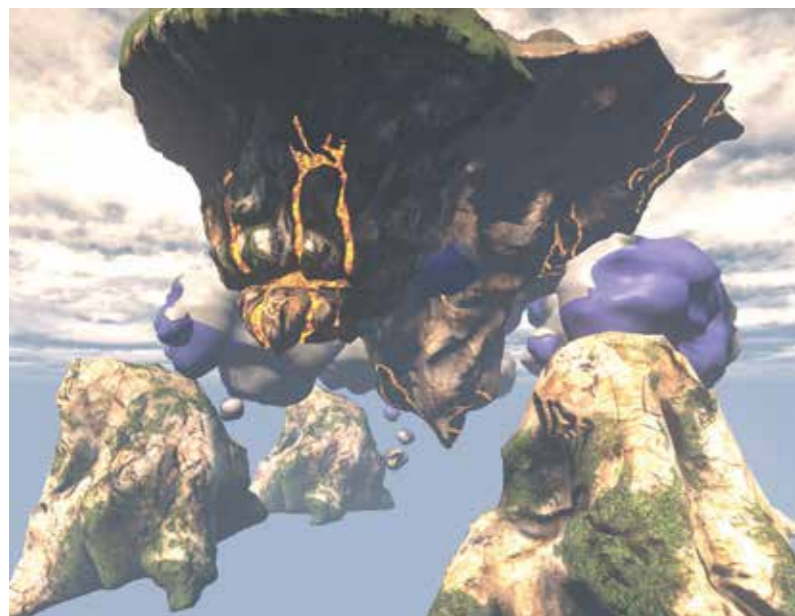

Stuart Roberts
Re-imagining *The Monster Mash*

I've animated a short piece based on recreating Bobby Pickett's facial performance to his hit song *The Monster Mash*. The project was challenging due to Bobby's facial range of motion. I also wanted to create a statement about the piece itself by expressing my own artistic interests and influences – an interesting contrast between two different eras of effects seen in film, games and music. I mixed classic 1930s black and white horror film effects with modern-day contemporary effects – as seen in the opening titles of the film *Se7en*. By merging these effects from two different eras of filmmaking I've merged Bobby Pickett's influences with my own to create my own style. The final piece is a standalone video piece with a separate making-of video. There is also a comparison section showing my chosen character rig without effects and then with effects applied. I used Autodesk 3ds Max, Adobe Photoshop, Adobe After Effects, Adobe Premiere and Audacity for advanced audio editing.

Mark Price
Theories of comedy

I have undertaken a comparative study of the different theories of comedy that can be incorporated within an animated short. Comedy is an extremely difficult area of storytelling that can often be poorly implemented by animators who focus more on visual aesthetics rather than the underlying writing. My project is an in-depth study of the pre-production process behind comedy animation and how it can be tested to ensure that the final product is entertaining. To achieve this I developed a series of storyboarded and live action animatics that drew inspiration from research. They were then presented to an audience to try and find out which animation they enjoyed most. Based on the feedback, the final product is a short animation produced using Autodesk 3ds Max that demonstrates the most effective comedy sequence.

Ryan Welding
Cut to the Chase – an animated short

I have a created a 3D short film, focusing primarily on character animation using only key frames. The story follows a knightly protagonist as he hunts a powerful antagonist through a forest and into a coliseum – the majority of the animation covers the chase. Finally the characters engage in battle – after a brief exchange of attacks, the two characters attempt a final desperate strike at each other, as the weapons near their throats the scene slows down and cuts before the blows land. I used Adobe 3ds Max for the characters, environment and animation, Adobe Photoshop for textures and Adobe Premiere to add effects and render out the final piece.

BA (Hons) Computer Games Art

Robert Buxton
Creating the Colossus

For my project I explored the workflow of creating a next generation computer games character, using new features such as tessellation to create a highly detailed walking colossus. The character will be on a massive scale, enabling the player to explore its rocky landscape. My project began from an initial concept sketch all the way to a final animated piece of work that I can display in the Unreal Development Kit.

Stian Mofossbakke Schuller
A Project in Norse mythology: Ås and Jotun

My project, based on Norse mythology, is an in-game scene located in a typical Norwegian environment with a self-portrait Viking and the Norse goddess, Frøya fighting a Norwegian forest troll. Scandinavian elements are increasingly used in modern games, – I wanted to make a story that could have been taken from exactly one of these games. I wanted to create my own version of her Frøya, one of the most used Norse goddesses in games. She's the most beautiful of the gods and also a warrior – a challenging mix. I decided to make a troll that really shows the forest growing on him, which is challenging in addition to his extreme asymmetry. The goal was to make the scene realistic and believable, and give me experience in making realistic characters of both genders with clothing variations, a creature and a complex environment. I used ZBrush, Autodesk 3ds Max, TopoGun, xNormal, Adobe Photoshop and the Unreal Development Kit.

Martin Graham Ellis
Character art styles in games

I have created three character models in different art styles from three separate game series. I chose *Borderlands, Final Fantasy and Fable*, comparing and contrasting them. This involved de-constructing elements of characters from each series such as anatomy, proportions, triangle counts, colour palettes, textures, common themes and shader/material considerations, then using this information to develop my characters in those styles. All character models were then imported into the Unreal Development Kit, to be posed and rendered in real time. Along with creating three real-time characters, I have created two high poly sculpts of realistically proportioned male and female characters to improve my knowledge of human anatomy, and to be used as a way of comparing each art style to realism. The project was created by using Adobe Photoshop, ZBrush, xNormal, Autodesk 3ds Max, and the Unreal Development Kit.

Giancarlo Pirelli
Beauty and the Beast: a visual redesign project

This project developed a visual aesthetic from a concept design based on the classic fairy tale, *Beauty and the Beast*. Instead of setting the story during the 18th century, I decided to set it in the distant future to have more room to play with the designs. I showcase different concept pieces from thumbnails to finished artwork, ranging from characters to environments. Ideally, these designs could be used for a classic point-and-click adventure game, where there is more emphasis on atmosphere, mood and visuals.
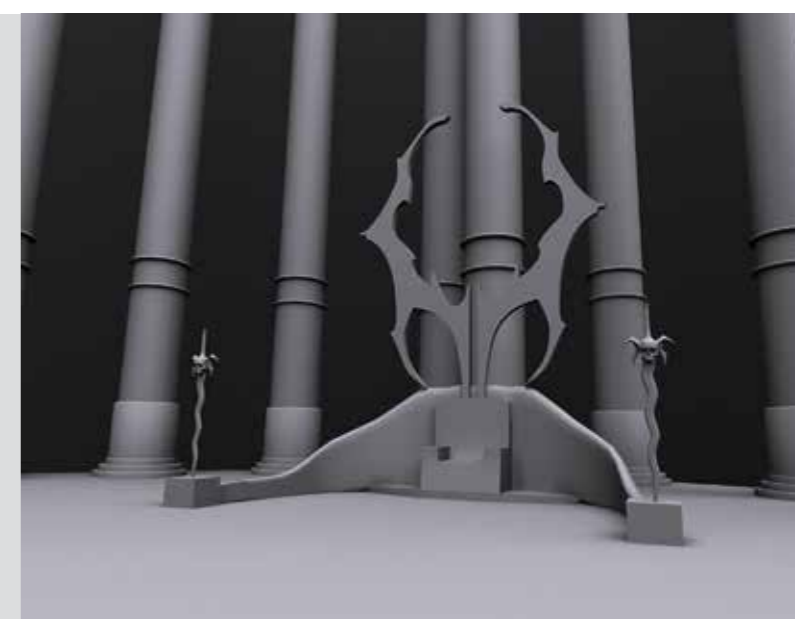
David Bailey
Welcome to Rekall

For my final-year project I have used Unreal Engine to create the Rekall Room environment from the 2012 movie *Total Recall*. I chose the scene as I enjoyed the juxtaposition within – the slightly dilapidated traditional Chinese symbolism and styles give the scene a relaxed atmosphere, while the cutting-edge technology of the time creates a jarring clash with its sprawled wires and bright displays. An interpretation of the action within it is forced from the comfort of old and to the loud brash new. In creating the environment I started with a block out of the entire scene and then replaced each piece in turn with the corresponding finished asset. To construct these assets I used Autodesk 3ds Max to create base meshes, then ZBrush to sculpt in the high-resolution details. Adobe Photoshop and xNormal were then used to create the textures. The final scene was brought together and lit in the Unreal Development Kit.

Andrew Martin Bell
DirectX 11: From an environment artist's perspective

My project is an exploration from an environment artist's perspective into the technology powering the latest real-time graphics and applications, DirectX 11. This study is presented in the form of a real-time 3D environment showcasing my abilities as an environment artist with particular focus on atmosphere and next-generation visuals. I chose to recreate a key environment from the *Legacy of Kain* game series, the Pillars of Nosgoth, during the time when the titular character uses them (ruined) as a throne for his vampiric empire. I chose this environment as it represents one of the defining areas in the series' universe and it encompasses the dark fantasy themes within the games. It also let me combine real-world gothic architecture within a virtual environment. The scene was composed inside the Unreal Development Kit and the assets were modelled and textured using a combination of Autodesk 3ds Max, ZBrush and Adobe Photoshop.
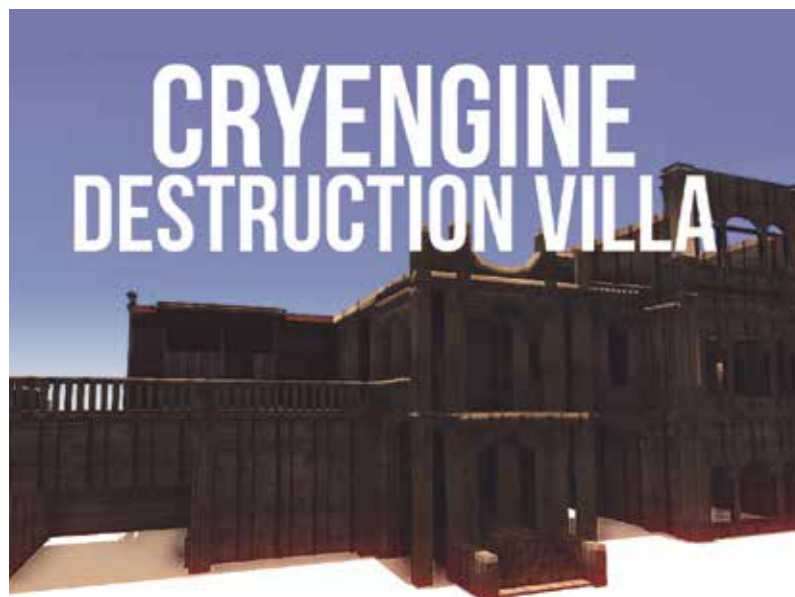
Christoffer Schjeldrupsen Stai
Primum

My project is a 3D scene, complete with three characters and an environment. Emphasis is on the characters and their story. The scene is set in our universe in the year 2336, on a distant planet known as Primum, named by the humans who discovered it roughly 40 years earlier. A human scientist and her dog are on an adventure with one of the planet's native inhabitants. I've always wanted to create my own planet with its own fiction and stories – and this project has given me a chance to tell one part of a greater story. My goal was to enhance my understanding of anatomy, both human and animal, to create realistic and interesting characters and creatures. And I wanted to create a scene that's easy to read and tells a good story. I intend for it to be used as an unlockable item that you would get for completing a certain task in a game – or maybe part of a limited edition version of the game, adding to the player's knowledge of the world and giving them further insight to the games story. I used ZBrush, Adobe Photoshop, Autodesk 3ds Max, xNormal and the Unreal Development Kit.

James Robert Clarke
French Colonial villa

I have created a realistic French Colonial villa environment in the theme of an old and abused criminal hideout. The environment is used as a playground for an array of destruction physics tests within CryEngine 3. It is a real-time game environment which the player can explore and interact with within CryEngine 3. The project explores architecture, design, damage and destruction. The assets are modelled in Autodesk 3ds Max and sculpted in ZBrush.

Daniel Taylor Jones
Space shuttle orbiter

Following the retirement of NASA's space shuttle in 2011 I decided to design a suitable replacement. Using Adobe Photoshop and traditional methods to create concept art, I came up with a unique science fiction design capable of taking off and landing vertically from anywhere and reaching orbit in a single stage, before returning to earth. I designed all aspects of the vehicle including the engines, interiors and landing gear. I studied aerodynamics and aircraft design from the last 60 years and researched NASA's space programme past and present to keep my design as realistic as possible. Throughout the project I was in contact with an aeronautical engineer who acted as a professional adviser. To create the shuttle I used Autodesk 3ds Max and ZBrush to produce high and low poly meshes and bake down the finer details to normal maps and used Adobe Photoshop to create textures. The shuttle was showcased using CryEngine 3.

Kent Packman
From concept to reality – 3D Lamborghini Aventador

The Lamborghini Aventador is one of the most exclusive cars in the world and, to use the words of the manufacturer, it is uncompromising, aggressive and extreme. I have taken this as the foundation for my project and set myself the task of creating a realistic 3D Aventador within the project constraints and deliverables. Following Lamborghini's design philosophies I have been uncompromising – pushing myself and my abilities to the very edge with an aggressive work schedule to achieve the highest standards. Taking the car to the extreme, I have devoted many hours and several iterations to achieving the finished article, requiring additional unplanned hours to overcome key challenges this level of project demands. Software packages to create the car included Autodesk 3ds Max, Adobe Photoshop, Adobe After Effects, Adobe Premiere and V-Ray Rendering System.
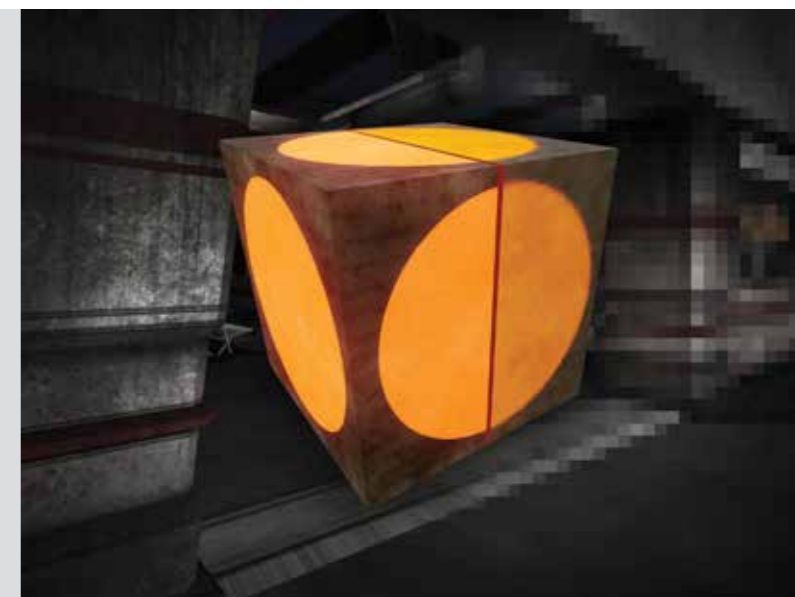

Ross Beardsall
Improving texture fidelity in real-time game environments

For my final-year project I have created a sci-fi environment based on a piece of concept art from the game *Dust 514*. The main focus of the project was to create a variety of shaders to help improve the overall aesthetic of the environment, especially with texture quality. I used a combination of detail textures and implied vector masks to give assets rich, crisp and believable surface detail. The project was completed within Unreal Engine 3, assets were created with Autodesk Maya and Autodesk Mudbox and textures with Adobe Photoshop.
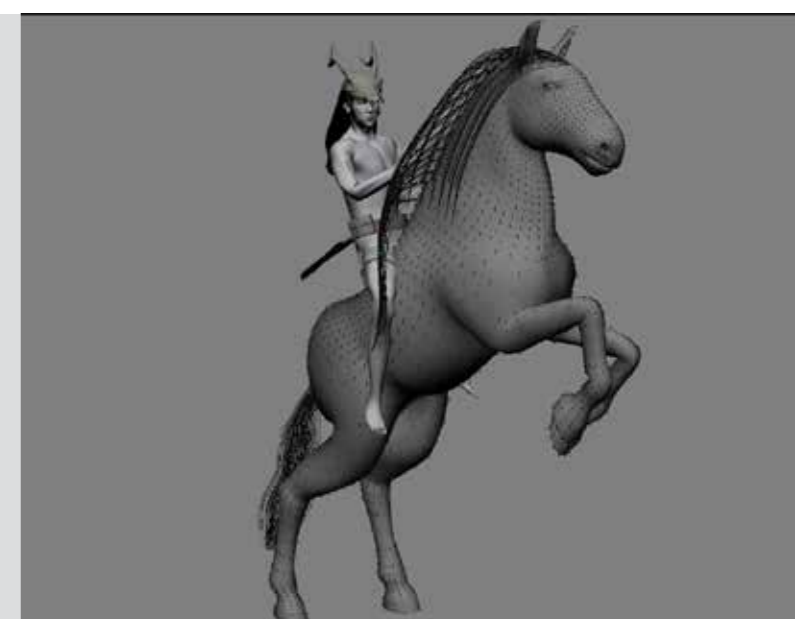

Peter Ostergaard
Representation of bipedal and quadrupedal anatomy: form and function in computer graphics

I have created a short sequence portraying a young man and his horse traversing the underworld seeking the help of a demon who holds the secrets to shamanism. The idea behind the project was to expand my knowledge of human and equine anatomy, and of a production pipeline. To further the visual experience images depicting the character at different events will help me understand the characters' appearances. A secondary purpose is to expand my skillset with different software solutions. I have used Autodesk Softimage, Pixologic, ZBrush, Adobe Photoshop, Headus UVLayout and The Foundry's Nuke.

Lee Parkes
The Wonderful World of Oz

For my final-year project I have created an environment and characters from the iconic story *The Wonderful Wizard of Oz* by L Frank Baum; taking inspiration from the classic 1939 film starring Judy Garland, and incorporating a Disneyesque cartoon art style like *Tangled*. I chose this subject because I found it bright, lively and not too constraining. It provided the opportunity to work on characters, structures and a landscape with foliage while giving me freedom for my own artistic expression. The main software I used was Autodesk 3ds Max, ZBrush and Adobe Photoshop. Finally it was all composed within the Unreal Development Kit.

Laura Massey
Tekkonkinkreet – the virtual environment

If you haven't seen the motion picture *Tekkonkinkreet*, I highly recommend it. The amazing artwork and captivating story inspired me to produce a section in 3D, allowing an audience to walk around the stylised environment to fully appreciate the detail that was hand painted into the film. Despite wanting to make all of Treasure Town, the main district of the film, I focused on the small area in which the two protagonists live. My original aim was to make the scene as accurate to the film as possible but there were objects from different sections I simply couldn't ignore – so I adapted them to fit in with my scene. I used the Unreal Development Kit to create a variety of shading techniques and post-processing effects, which make the models I produced in Autodesk 3ds Max and the textures I created in Adobe Photoshop resemble *Tekkonkinkreet's* unique style.

Paul Hutchison
Interior environment and narrative lighting

This project focuses on the many processes involved in creating a real-time game environment from an existing game concept. My research and dissertation explored the use of compositional light as a narrative device by classic artists. I used these observations to implement final lighting schemes that I hope hold emotional clues and a secondary layer of information that isn't always apparent when using lighting exclusively as a function of design.

Matthew Selly
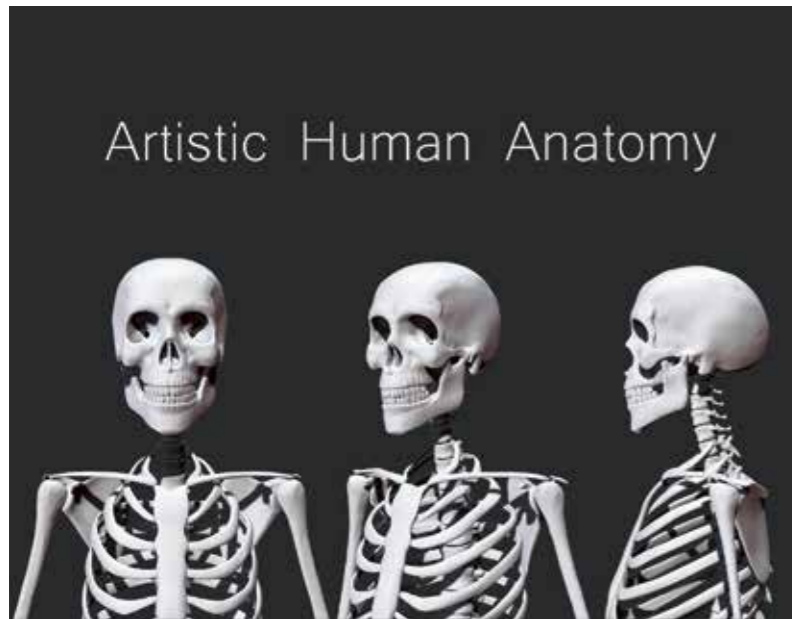### An exploration into materials and shaders for use within current and next-generation game environments

My project is formed of two parts – a research paper and a practical implementation of the research to build a game environment within the Unreal Development Kit. The game environment I created showcases my skills as an artist. It also demonstrates the importance of researching correct methods and workflows, and learning the industry standard before embarking on a project. I chose to outsource the concept for the environment I created so I could focus on my 3D and texturing skills. As a result I believe I have captured the original artist's vision much better than I could have done following a concept of my own. Focussing on the use of materials, especially to mimic surfaces and lighting, makes the whole thing come together. I wanted to show that I could create a quality piece of work, combining working from a concept and following industry-standard workflows, proving I would be a great asset to an employer.

Lars Erik Helgemo
Game characters for tablets

For my project I designed two game characters for the ever-growing tablet device market. I also wanted to use these characters to further my knowledge of anatomy and how I can apply that knowledge into exaggerating proportions while maintaining the appeal of the character. The result of these criteria was that I had to create one male and one female character – the male was exaggerated in some way while the female has more or less normal proportions. During the design of these characters, I kept in mind the kind of game they were being made for.

Simon Bradley
James Went
WipEout Reinvented

One of the first games that got me truly hooked was *WipEout 2097*. Ultimately it was the start of a journey that led me all the way here today – a journey that will hopefully carry me into the exciting world of making games. To me, it stood out for a number of reasons; the speed, the cool soundtrack but mostly the wild, exciting worlds I got to hurtle around. Each track was unique and had its own personality, and I would often dream up my own crazy worlds to race around. And here's my chance to make that dream a reality. I tasked myself with designing, conceiving and building my own WipEout track and see if I can introduce some new techniques and technology to polish it up a bit. I have themed my track around a futuristic spaceship assembly factory (much like a car factory today, but bigger). It's been a long time coming but I finally got to build my own WipEout track!

Andreas Ebbesen Hopen
Human anatomy for an artist

I recreated the human body form in an artistic but anatomically correct method. I have sculpted all the bones in the skeleton and the muscles to recreate the beautiful form of the human body. I used ZBrush mainly. I really wanted to discover all of its possibilities, and to go in depth and overcome the challenges encountered. When it comes to the topology, I used TopoGun and 3D-Coat, which is great for retopology and works well with ZBrush. I chose this project because I wanted to have a greater understanding of the human anatomy, to produce more realistic and believable characters in games and movies.

Leanne Joy Elliott
Atlas, an island

I have created a small environment based on an image of the Greek god, Atlas who is sunk, chest deep, into the ocean. After many years in ruins, a civilisation has built a small, elegant settlement that has become part of him, mostly formed of stone. There are ruins around the small island, and there is no other land in sight. I aimed to create a realistic environment that had a sombre atmosphere. This involved me expanding my skills within the engine. I built the environment using Autodesk 3ds Max, Adobe Photoshop, and the Unreal Development Kit. I also used ZBrush, nDo2 and Marmoset Toolbag to enhance my project further. I have created the majority of models and done all developmental work myself – anything that I didn't create is referenced accordingly.

Emma May Perry
Two sides of the same coin

For my project I decided to experiment with art styles, using the same character concept and changing him to suit two different genres, each with its own characterisation. The main focus of my work is concept art, in which we see the character Satyr blossom into two very separate individuals... Multiple poses for the both of them reflect their own unique personalities. From the concept art two models – complete with small setting – have been rendered to in-game quality and rigged for posing and beauty shots. The models (both character and environment) have been produced, skinned and posed in 3DS Max to further enhance the concepts.
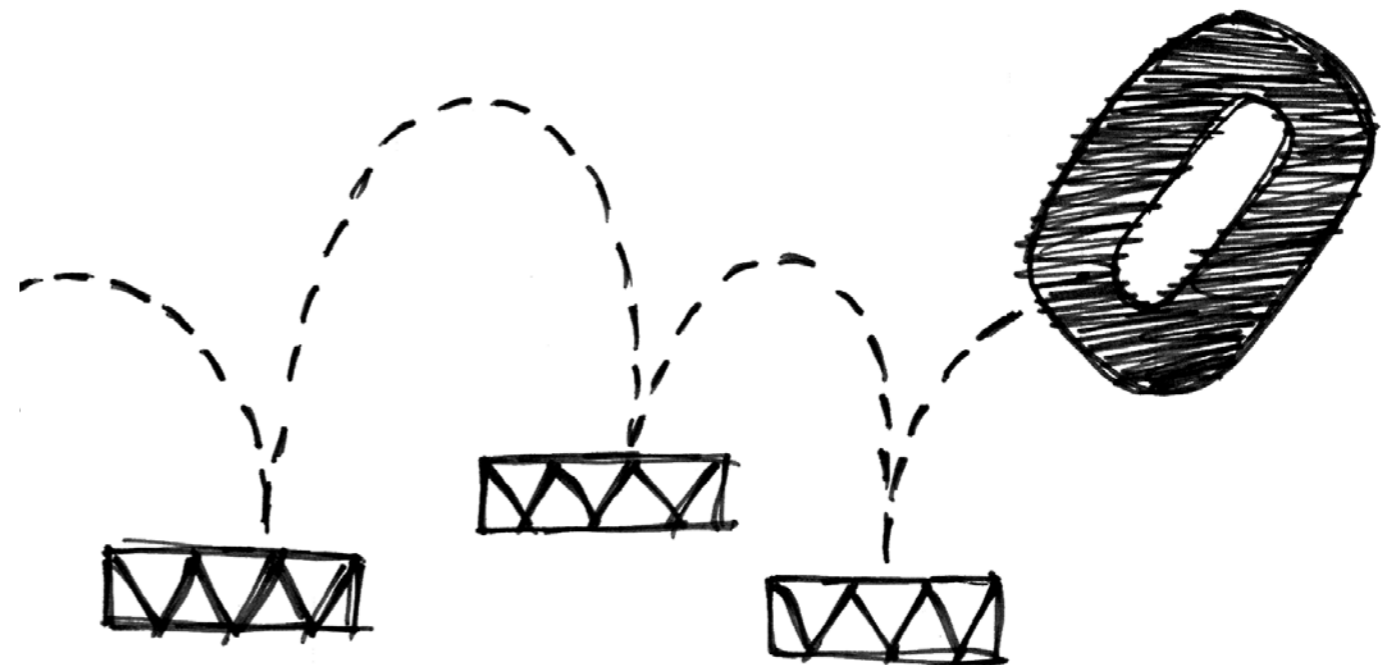
Joakim Lundstrøm Olsson
Kurama Onsen

For my project I recreated a hotspring bath I visited, in Japan in 2008. Located just outside Kyoto, in a small Buddhist village at the end-station of an old train track, it was a place of incredible beauty. Of all the places we visited in Japan this was the place I saw fit for recreating. I used Autodesk 3ds Max for modelling the static meshes, Adobe Photoshop for texturing, CrazyBump for normal maps and finally the Unreal Development Kit for lightning, special effects, landscape and putting it all together.

Ben Armstrong
Old kitchen environment

I have created a next-generation interior environment in the Unreal Development Kit. It is based on a 2D piece of art which was used in a small game called *Witch Hunters: Stolen Beauty*. I first saw the artwork on CGHub and immediately wanted to recreate this highly detailed and atmospheric painting as a 3D beauty map. I wanted to convey as much of the original pieces composition, assets, lighting and atmosphere as I could in the final scene while also trying to push a more realistic quality in the art. The base meshes and game assets were created in Autodesk 3ds Max. ZBrush was used for creating the high poly sculpts to capture the fine details of the assets in the picture. I created my textures using a combination of Adobe Photoshop and poly painting in ZBrush. The final scene was brought together and lit in the Unreal Engine.

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Web & Digital Media

These wide-ranging projects cover several disciplines which all share a common theme of using highly engaging visual and audio media to support commerce, business-to-business web services, education, social networking and entertainment. The research and development 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.

BSc (Hons) Web Development

Joseph Walls
SewVeryPretty e-commerce website

I have designed and developed an e-commerce website for a client who is a designer-maker of bespoke household goods. The client required a website to promote and sell her products. My aim was to create a website which the client could maintain without having any knowledge of HTML, CSS or any other coding language. The client can add new products to the site and also update or delete existing products. I have worked closely with her to ensure her visions and ideas for the website were portrayed in the final product, while maintaining web and accessibility standards. To provide the optimal user experience a responsive design was also applied to the website, allowing the client to appropriately showcase her products on a variety of devices and screen sizes. To produce the site I used a range of languages and technologies including JavaScript, jQuery, PHP, SQL, HTML5 and CSS3.

Matthew James Rollinson
Slept – alarm clock application

My alarm clock application, Slept, has many useful features for waking up in the morning. It allows users to create alarms through the website and synchronise them with a mobile application. It is able to set alarms based on recommended sleeping times as well as having a wide variety of alarm clocks, such as taking a picture of a QR code to turn off the alarm and playing customised voice recorded messages. It also features a group alarm system which sounds alarms for the group of people to remind them about important events such as meetings or outings. It also enables people to send messages to a group alarm after it sounds which relate to the event and may be read by others.

Shelley Robyn Weeks
A personal information management tool for higher education students

I have developed a personal information management tool for higher education students to bring together related functionality such as task and event management, note taking, generic lists, visual bookmarking and storage. Users can choose whether content is personal or collaborative, and customise their content and design as well as access the content on multiple devices. The application uses Yii, a PHP model-view-controller framework with a MySQL database and the Backbone JavaScript framework to organise the client-side, communicating with the server RESTfully. HTML5's history, offline storage, application cache, drag and drop. I have also used application programming interfaces.

BA (Hons) Web and Multimedia Design

Samantha Jane Waistle
LogoMakr

I have developed a logo-creating application that can be accessed from the web. The logo creators that are available at the moment are all Adobe Flash based. My aim is to revolutionise this with the power of HTML5 and JavaScript. My logo creator offers simple shapes, fonts and colours for the user to choose from – these options can be customised to the users taste. The user can save completed logos for them to use. The application also offers hints and tips on creating a good logo. The inspiration came from my love of both logos and learning new technologies. The application was created with HTML5 and JavaScript using Adobe Dreamweaver.
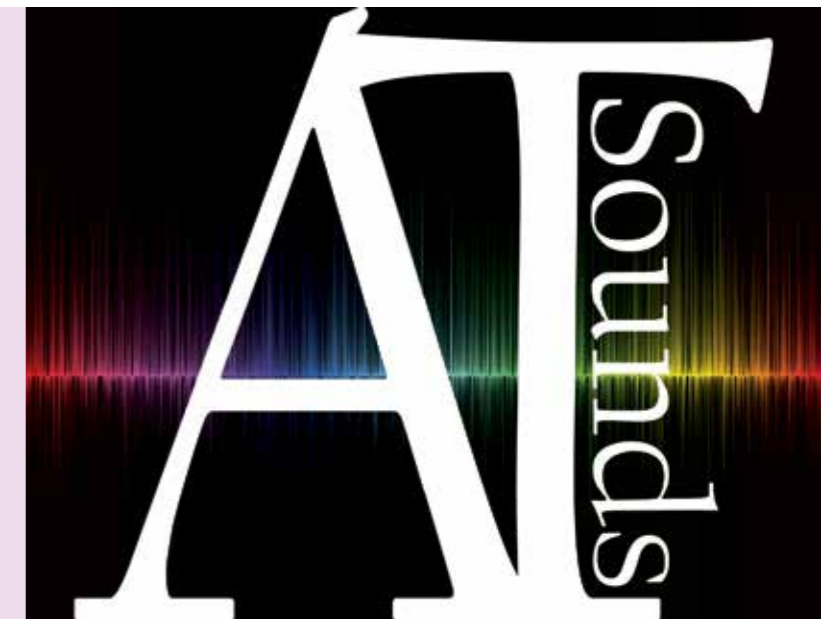

Samantha Trobe
PA hiring system

I am regularly asked by bands 'Why can't it be easier to hire small concert equipment?' So here it is – a solution to the problem. I have created a website using open source software with the capability to view equipment, request a quote and hire a PA system for bands, comedians and co-ordinators. It was inspired by someone I previously worked with when helping do the photography for bands as well as helping get the system from storage to venues.

John Longster Porritt
Alumno – social virtual learning environment

I have created a new style of virtual learning environment – Alumno will hopefully become a standard in the UK allowing students and tutors from schools, colleges and universities to handle their educational and social lives in one place. The web application also adapts itself if a user has any disabilities. I feel very strongly about education and believe that it is time that students got the most out of today's technology to assist them with their studies and also to help users with learning difficulties or disabilities. Alumno encourages learners and teachers to be more engaged in their academic activities and also to communicate more frequently with each other by allowing them to access this service in multiple ways, through a web and mobile application.
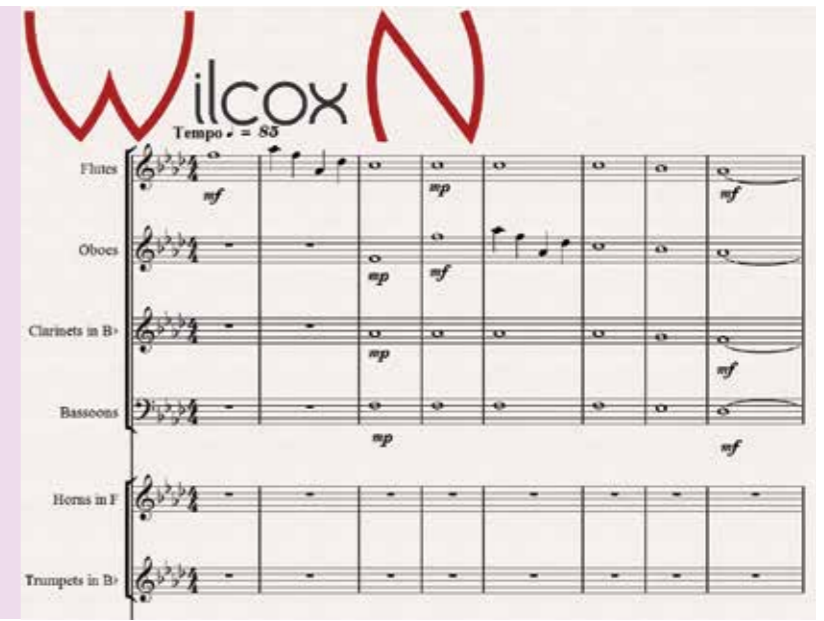
Joe Mitchell
WYSIWYG page edit tool

My project focuses on allowing website administrators who struggle to update their websites with confusing interfaces, to easily and clearly edit their online content. I created a 'what you see is what you get' page editing tool that relies on JavaScript to allow website owners to edit their page content from the page view – they can see the edits they are making and how they will look as they do them. It also allows administrators to easily add new elements to the page and move blocks around without any technical knowledge or ability. The tool is made for web using HTML5, CSS3, JQuery and a small amount of PHP. The designs for the tool panel were made with Adobe Photoshop.

Nicholas Wilcox
Library music and Foley

I have created a selection of library music for film and television that is accompanied by Foley sounds. I have created several pieces in different genres to demonstrate the different styles of music I can create. The purpose of my library music is to show how a melody in one genre can be represented in many different ways, principally in the feel of the chords behind it. As far as the Foley element comes into my work, I feel that it is a good way to show how I work with sound manipulation, and how to make things sound like something they are not. Showcasing my work in this way allows me to combine my compositional skills along with my sound manipulation and design skills working in a sound space. I used Apple Logic Express 9 to create the majority of my compositional work along with Abelton Live software. To record sounds I used Avid Pro Tools.
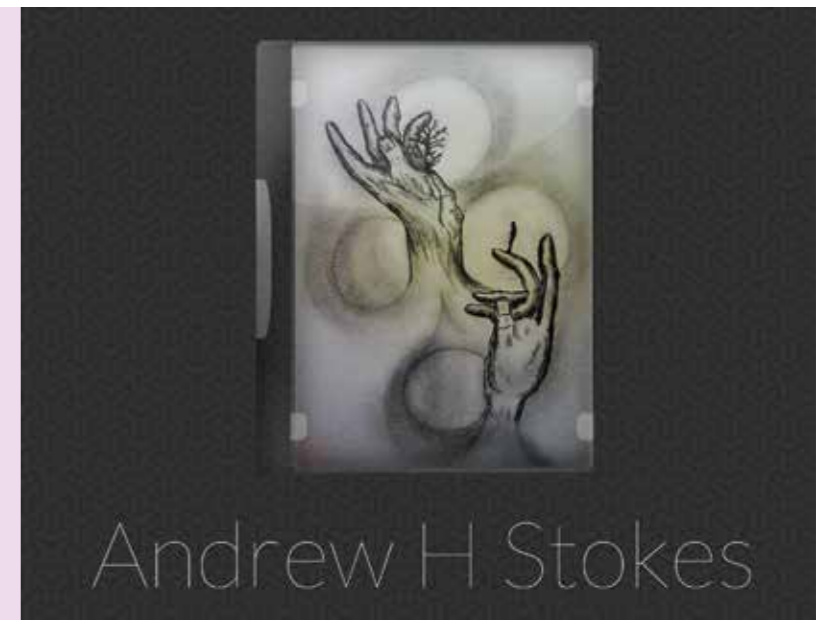

Ann Marie Merrie
MathMagical

I have created a mathematical educational application for key stage one students who have both dyslexia and dyscalculia. The application will be available on tablet. The inspiration for my project came from experience of working with disabilities and the lack of support and understanding for people with dyscalculia. The reason I chose to combine dyscalculia with dyslexia is because they are different disabilities but are also similar in many ways, with some people being diagnosed with both. By creating an application to target both disabilities it expanded my knowledge of accessibility and design as well as strengthening my skills developing an Adobe Air application. The Air application has been created in Adobe Flash and the graphics have been created in Adobe Photoshop.
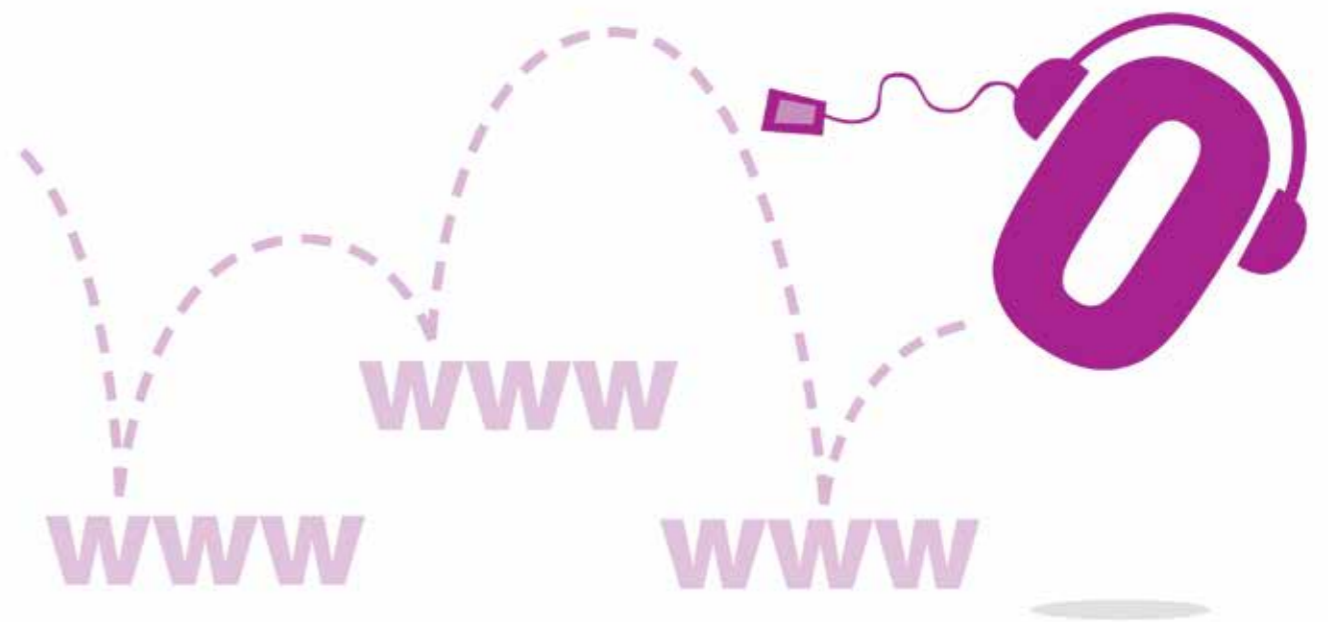

Andrew Stokes
Library music for film and game

From the ominous low strings of a thriller to heart fluttering romantic film scores, this is a collection of library music for film and games that aims to be expansive enough to showcase my current abilities. Without a form of media to accompany this project, I have concentrated on bringing the emotions and dynamics of the pieces to life, creating standout moments you would typically find in the standards of film and game music you hear today. All composition and production of these pieces has been done using Logic Pro 9 and the vast majority of mixing using Avid Pro Tools 9 and 10.

Pawan Nangla
Personal portfolio with responsive design

Different types of web technologies allow users to create and design their own personal portfolio. With HTML5 constantly growing and evolving, will this be the new cutting-edge technology? For my project I have created my own personal portfolio which can be viewed on different sized devices using CSS3 Media Queries. The website itself allows me to show off the work that I have designed and put together during my academic years and whilst being on work placement at The Walt Disney Company as a designer. For the design elements I used Adobe Photoshop and Adobe Illustrator, while the website was developed using Adobe Dreamweaver in conjunction with HTML, CSS3 and PHP.

Games & Graphics Programming

The game designer's imagination must be turned into a reality by the game programmer. These projects require skill, both technical and creative, to enable all manner of ideas to be implemented efficiently and effectively on contemporary hardware. Often these projects focus on prototyping new gameplay features, developing flexible but efficient software architectures, or constructing software technologies to visualise virtual worlds and mimic the beauty and complexity of reality efficiently on contemporary hardware. The games programming course is delivered by lecturers with previous industry experience alongside those with strong research activities in this area. These skills are passed onto our graduates who now work at prestigious games companies around the globe contributing to some big games titles. The success we've enjoyed is recognised by Creative Skillset, which has accredited our computer games programming course.

BSc (Hons) Computer Games Programming

Ivan Martinez Del Rio
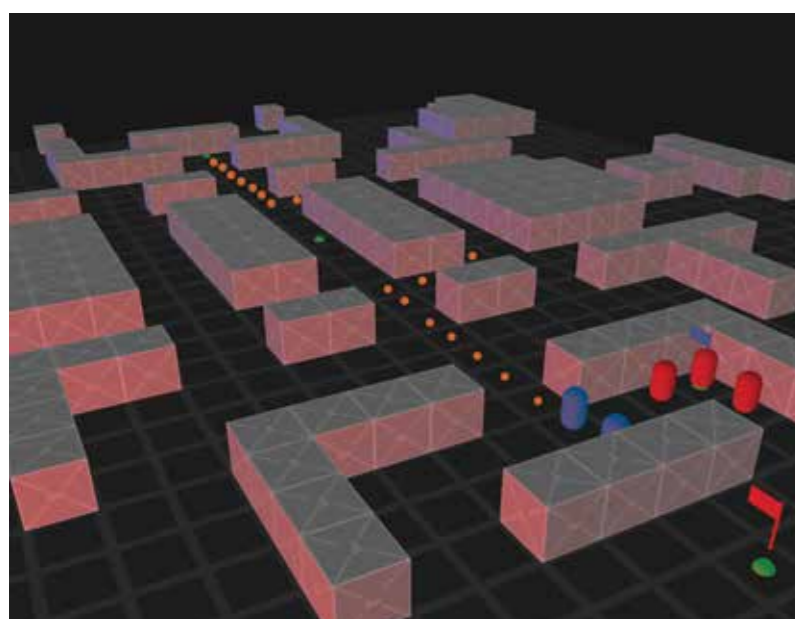### AI for real-time strategy games

It has been proved that real-time strategy games are one of the more thorny genres as far as artificial intelligence is concerned. Good architecture and planning is necessary to ensure success and to test your abilities to the limit. I have developed and implemented a real-time strategy game framework using Unity 3D as the engine, and implemented an artificial intelligence system using various techniques like multi-agent systems, goal-directed behaviour and finite state machines using C#. In the demo you can see how artificial intelligence builds its economy to grow an empire in a 3D environment, and how it uses different approaches to achieve its goals every time you execute the demo, trying to be as unpredictable but also as efficient as possible.

Iraklis Akritas
GPU/CPU blend shape deformer parallelisation

'Life-like facial animation is one of the most difficult problems to solve in 3D, and one of the most important things to get right.' – Autodesk. Procedural animation has been gaining more attention recently due to the advances in animation technology. However, there are trade-offs with procedural animation techniques such as the performance of the simulation, stability of the resulting animation and believability of the motion. The project aim is to enable animators to create highly expressive and believable facial animation by mixing several expression components using an optimised per-vertex animation shape interpolation (morph target animation) deformer. The deformer harnesses the graphics processing unit via the C++ Accelerated Massive Parallelism library for data parallelism to accelerate the deformation process and the central processing unit via the Parallel Patterns Library for task parallelism to deform multiple blend shapes at the same time. The deformer tool is to be implemented as an extension to the existing proprietary tool by EmotionAI™.

Marty Daniel Green
Enhancing the belief, desire and intention model to learn from experiences

I have created a simulation of capture the flag using the belief, desire and intention (BDI) model in a multi-agent system. I have improved on BDI by using a reward-based approach that allows agents to learn from past mistakes or successes. This allows agents to make long-term tactical plans for completing a high-level goal. The goal is to make agents that play differently every time you play the game and adapt to the user. Using the BDI model agents will make decisions based on world events rather than actual knowledge. This makes the agents act more like humans as they don't know everything about the world around them and they can adapt to new events. The project is written in my own 3D engine (Eureka 3D) with C++ and uses C++11 features.

Haydn William Peterswald
The Garden – simulated plant growth and evolution

This project seeks to model living flora in a 2D world. Vegetation is a common component in computer game worlds, yet despite becoming more detailed and better rendered, plants and trees in modern games are still fundamentally static. They do not grow, change or evolve. Written in Python, The Garden is an open-ended simulation of growth and evolution. It endeavours to produce aesthetic and diverse plant-like organisms which are capable of adapting over generations to a changing environment. It creates gardens in machines.

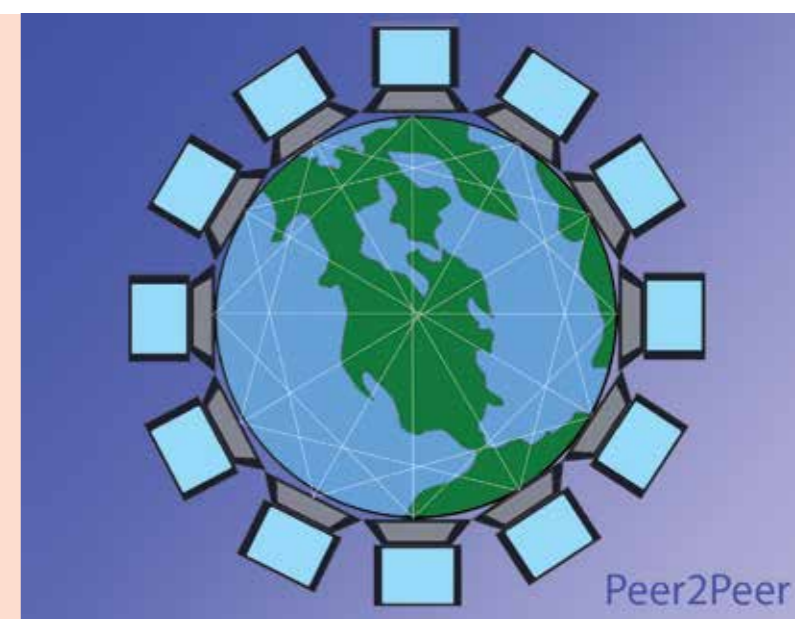## Eduard Gibert
Real-time volumetric clouds

Clouds are the most important elements in flight simulators and outdoor scenarios. Real-time, realistic looking clouds are one of the most difficult elements to simulate in computer graphics. That said, I investigated the performance and the realism of two different techniques for simulating realistic looking clouds: one old and common technique called cloud impostors and a new, powerful technique called volume rendering. I have written two demos – one with cloud impostors and the other with graphics processing unit-based volume rendering. I tested both in terms of performance and realism and tested my hypothesis, which is to find out which technique is going to be better for rendering real-time clouds based on their performance and realism. The two demos are written in C++ using Visual Studio 2012 and OpenGL 3.3.

Sean Chapman
A modular, peer-to-peer networking framework

I developed a peer-to-peer networking prototype which can be easily used in existing applications and games. The essence of the network is that the peer users will never be disconnected from each other. If the host goes down, one of the peers is nominated as the new host and the peers will resume network communications. My product consists of a standalone, black-boxed daemon process which an external application can communicate. Quality assurance is a big part of the project, with new hosts chosen by the network. My motivation for this project is to learn how to write practical peer-to-peer solutions. The problem with traditional client-server architecture is the centralised point of failure. This problem is solved using a decentralised peer-to-peer architecture which is also cheaper to maintain – but this architecture comes with disadvantages, such as difficulty of programming and the bespoke nature of such projects.
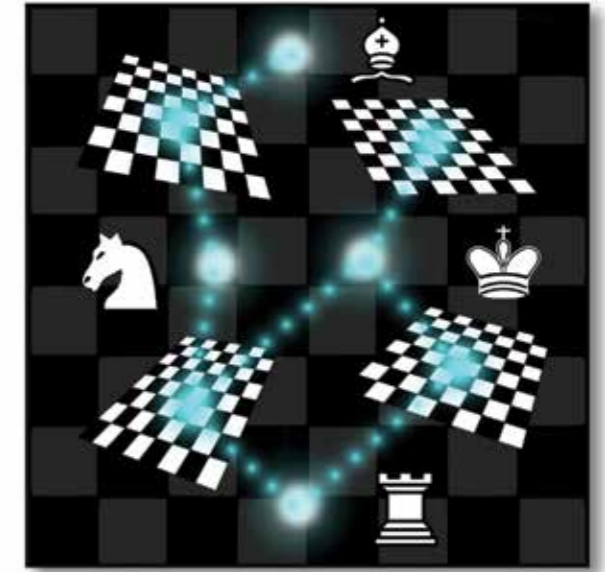
Sam Oates
Kinecting tools and their users

My project explores the Kinect human-computer interaction interface as the user control for a terrain editing tool. The project aims to investigate whether a different interface could revolutionise games development, in particular the ability for game artists and designers to develop 3D worlds without the need for the standard keyboard and mouse. The tool is founded on the principal of parallel processing to enable multiple threads to run concurrently. Running concurrent threads allowed me to develop my project to incorporate hand gesture recognition. The tool system is written in C++, making use of the Direct3D 11 application programming interface, allowing for real-time tessellation.

David Griffin
Cypher chess

Holding a strong interest in computer chess, my project was an excellent opportunity for me to gain a better understanding of the development of chess programs. I am focusing on searching algorithms, representing the board states in memory, and evaluating the chess positions. With the number of potential chess moves being rather large, developing the chess engine is an interesting challenge to undertake. Developing an intuitive user interface, combined with a stable and flexible artificial intelligence system, will create an enjoyable casual chess game.
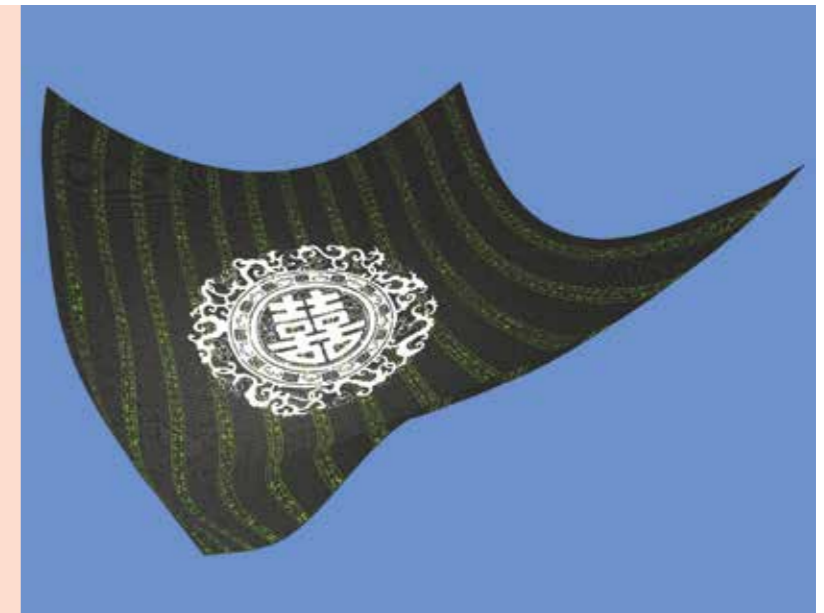

Luke Withington
Multi-agent protection simulation

My project explores an artificial intelligence technique known as goal-oriented action planning used in multi-agent systems. My example takes this usually offensive-based technique and applies it to a defensive VIP protection simulation. Using Unity as a quick and easy-to-use engine for my prototype, the player must attack the VIP while the bodyguards (artificial intelligence agents) must protect the VIP from harm using knowledge gained in the world and sharing it among the agents.

Daniel Green
Cloth simulation

For the most part, cloth in video games is limited in complexity or even completely static due to performance issues. This motivated me to research into combining the complexity of highly detailed cloth simulations while still keeping the simulation in real time, where it is suitable for interactive applications such as video games. I also wanted a very flexible solution so that the cloth simulation I created would be suitable for simple simulations (flags) and complex simulations (character clothing like capes). To increase the performance of the cloth simulation, I looked into using the graphics processing unit over the central processing unit.
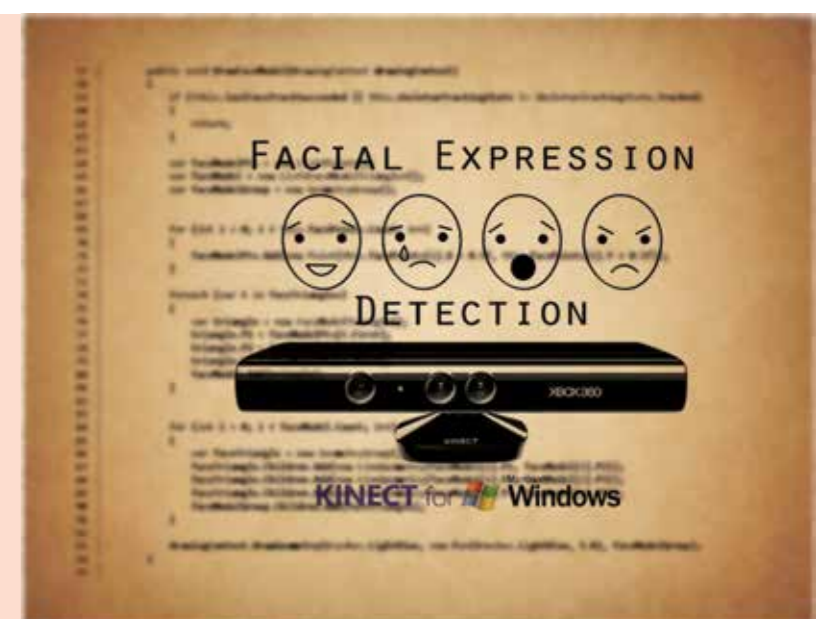

Daniel James Bradshaw
Creating a simple-to-use and flexible API for simulating particles on graphical processing units

Leveraging the use of the huge parallel capabilities can yield stunning effects for use in games. By designing a simple-to-use, yet flexible application programming interface (API) I have allowed programmers ease of implementation into their game engines and products. By making use of huge numbers of particles, they are able to be rendered at a smaller size and allow much greater realistic effects. Using OpenCL allows great flexibility and customisation. I also wrote a tool that allows the particle systems to be edited on the fly and generate client code to interact with the API.

Mojtaba Ghanizadeh Abry
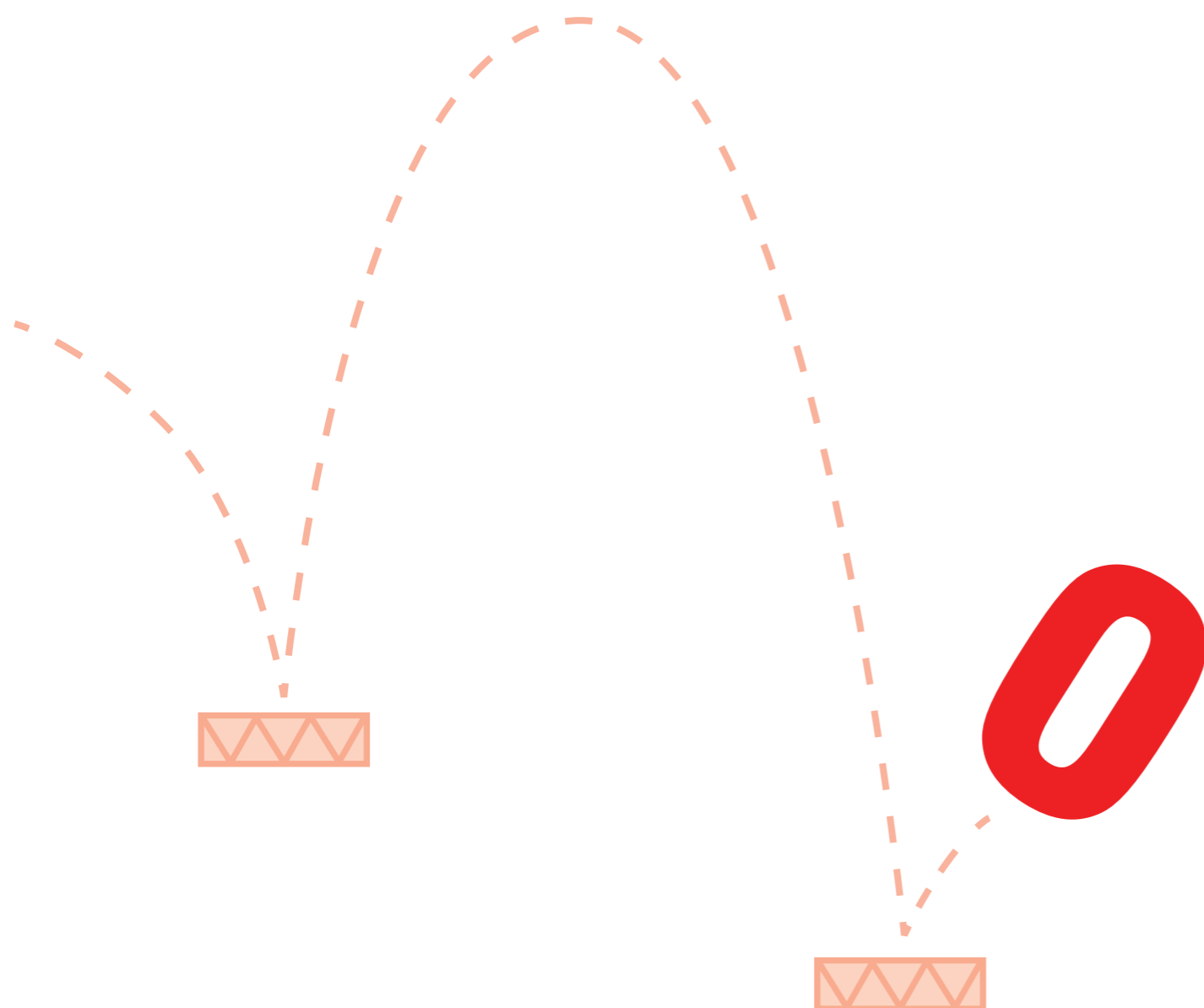### Real-time expression recognition

Microsoft Kinect is a motion sensing input device equipped with RGB camera, depth sensor and multi-array microphone which provide skeleton tracking for motion capture and gesture recognition, as well as facial recognition and voice recognition. I have developed software to see if Kinect can reliably identify basic facial expressions such as happiness, sadness, anger, fear and surprise along with its other capabilities. This could result in a new form of input for applications such as role playing games where the user's expression could influence certain scenarios. The software is using the Kinect Studio v1.6 SDK and is written in C# using Windows Presentation Foundation.

BSc (Hons) Computing

Dean Phillip Bill
Multi-user dungeon games: still relevant

To learn more about every step taken to release a computer game, including design and distribution, and to demonstrate that the techniques used in developing multi-user dungeon games are in essence the same as those used in today's top titles, I have created my very own multi-user dungeon game using a combination of C++ and Python. The game, titled *Contagion*, is set in the small, fictional city of Guiswell which recently became a quarantine zone when the dead mysteriously began to rise from their graves and hunt the living. Contagion is available for download but, as it can only be played online, new users must create a free account before they can begin exploring.

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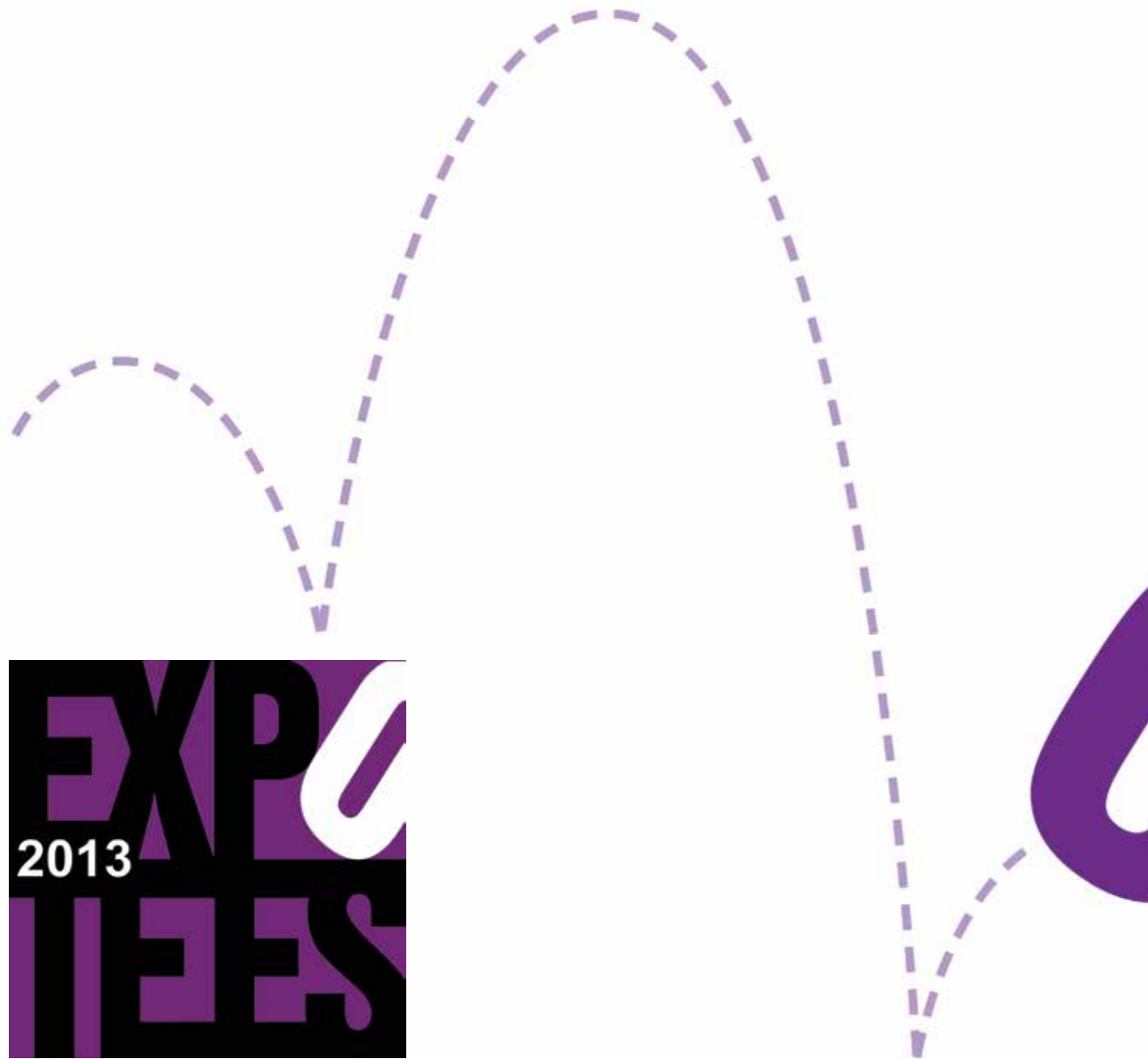
Computing & web

Computing

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- Computing, FdSc
- Computing (Networking), FdSc
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Acknowledgements

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Every final-year undergraduate student is guided through their 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 to the final-year students who make the hard work worthwhile.

For any questions about ExpoTees please contact Joanne Noble at j.e.noble@tees.ac.uk or on 01642 342639.

Stay in touch – join us on our ExpoTees LinkedIn group – meet academics, ExpoTees exhibitors (past and present) and our supporters.

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