Game Development

Your Name: Chris Headleand

Projects:

- Procedural Content Generation in Games
- Artificial Humanity

- Virtual Wheelchairs / Mobility Enhancement
- HCI and Interfaces in Mobile VR

Project Name
Procedural Content Generation in Games
Project Description:
The focus of this project is on generating in-game content algorithmically rather than manually by a designer. The student can choose to explore any of the following sub-projects: • Procedural character animation. • Procedural game pacing (changing the pace and difficulty of a game based on player behavior) • Procedural environment generation. (Landscapes and buildings) • Procedural missions and quests. The student's investigation should align with one of the following open-ended research questions: **1.** How can in-game content be produced algorithmically? **2.** What impact does procedural content have on player experience?

To elaborate, the research should either explore novel methods for producing specific in-game content, or explore the impact of specific procedural content on players.
Are there any prerequisite skills / courses?
NA
Which degree program is this aimed at? (It can be more than 1)
Computer Games Programming
Number of students you wish to undertake this project
4

Page Break

Project Name
Artificial Humanity
Project Description:
This project seeks to simulate certain aspects of human-like decision-making. The intention is not for accurate reproduction or simulation of human behaviour, but something that is contextually appropriate to an observer or player. To elaborate, the intention is to produce believable, or engaging behavior that would suit a creative application such as films and games. The student can pick any aspect of humanity inspired decision-making, but ethics and emotions are of particular interest. This project would best suit a student with a strong interest in creative applications, but is not limited to the Games Computing degree programme.

Are there any prerequisite skills / courses?
NA
Which degree program is this aimed at? (It can be more than 1)
Computer Games Programming / Computer Science
Number of students you wish to undertake this project
4

Your Name: Jussi Holopainen

Link to your staff profile page: http://staff.lincoln.ac.uk/jholopainen

Any other relevant links to your research:

http://www.europeana.eu

http://labs.europeana.eu

Complete this form for each project that you propose:

Project Name
Engaging with Digital Cultural Heritage – case Europeana
Project Description:
Europeana collection gives access to tens of millions of digital and digitized artworks, artefacts, videos, and sounds from across the Europe. The Europeana Labs offers APIs to access re-usable parts of the Europeana collection and there are already many interesting applications using the platform. This project aims to develop an application that uses cultural re-mixing as an approach to make cultural heritage more engaging for children and young adults. The application should use the Europeana Labs platform in a novel and interesting way. The application concept will be developed in close collaboration with University of Lincoln digital cultural heritage researchers.

Are there any prerequisite skills / courses?
Programming is a must, user interface and/or game design skills beneficial
Which degree program is this aimed at? (It can be more than 1)
Computer science, games computing, information systems
Number of students you wish to undertake this project
Max 6

Your Name: Jussi Holopainen

Link to your staff profile page: http://staff.lincoln.ac.uk/jholopainen

Any other relevant links to your research: gameplaydesignpatterns.org

http://www.jorisdormans.nl/machinations/

Complete this form for each project that you propose:

Project Name
Exploring resource management game design patterns
Project Description:
Resource management and internal economies are the building blocks of many kinds of games. The gameplay design patterns collection has several patterns describing how to design for these aspects. There are also tools, such as Joris Dorman's Machinations, which try to make the design and simulation of such systems easier for game designers. This project will develop several simple resource management games using both the game design patterns approach and the Machinations framework in order to find new resource management patterns and to test the robustness of the approaches.

Are there any prerequisite skills / courses? Game design, programmin
Which degree program is this aimed at? (It can be more than 1)
Games computing
Number of students you wish to undertake this project
3-5

Your Name: Jussi Holopainen

Link to your staff profile page: http://staff.lincoln.ac.uk/jholopainen

Any other relevant links to your research:

gameplaydesignpatterns.org

Complete this form for each project that you propose:

Project Name
Making sense of gameplay design patterns collection
Project Description:
The current gameplay design patterns collection contains almost 600 patterns, covering many different aspects of game design. The patterns are also related to and reference each other in complex ways. One of the problems with using the pattern collection is that the patterns are categorized in haphazard way and it is difficult to get an overview of the patterns in a meaningful way. The project aims to 1) provide different automated methods of clustering the patterns and 2) develop a visualization and browsing tool for the pattern collection. The students will get access to the current patterns database and there is a possibility for making the results available for the wider audience through gameplaydesignpatterns.org.
Are there any prerequisite skills / courses?

Programming graphical user interfaces, visualization techniques, and cluster analysis beneficial
Which degree program is this aimed at? (It can be more than 1)
Computer science, games computing
Number of students you wish to undertake this project
Max 4

Your Name: Jussi Holopainen

Link to your staff profile page: http://staff.lincoln.ac.uk/jholopainen

Any other relevant links to your research:

http://frequency.org.uk/

Project Name
Public Space Movement Game for Frequency Event
Project Description:
Public space games allow people to play games in public spaces, frequently on large displays. Using standard controllers/interfaces for this can be problematic or obstructive. One type of interesting public space games are those with multiple individuals working together in a group to control a game character - either against an NPC or against another group. This project will develop one or more simple games that can be controlled by groups of people in public space. One example is a simple two playing racing game where the steering is controlled by Optical Flow calculations on the two halves of an image of a room (i.e. on each half of the room). The public space game is aimed for the Frequency digital culture festival in Lincoln 2019. Outputs from this project would be valuable to the School and you, for both showcase and recruitment activities. Additionally, if the project is successful enough it will be showcased in the Frequency festival.
Are there any prerequisite skills / courses?

Programming is a must, user interface and/or game design skills beneficial
Which degree program is this aimed at? (It can be more than 1)
Computer science, games computing
Number of students you wish to undertake this project
Max 6

Your Name: Jussi Holopainen

Link to your staff profile page: http://staff.lincoln.ac.uk/jholopainen

Any other relevant links to your research:

Complete this form for each project that you propose:

Project Name
York Minster Location-based Games
Project Description:
York Minster and its surrounding areas are full of historical significance. This project aims to make visiting York Minster more engaging and educational for families, particularly those who live close York, by offering location-based games (including augmented reality) on smart phones. The games should use the historical material provided by York Minster, educate the intended audience about the history and significance of the Minster, and take into account the identity of the site as a living church. The project involves selecting the appropriate technologies to be used, designing the game(s) in collaboration with York Minster staff, implementing a prototype, and user testing the prototype preferably on the site itself.
Are there any prerequisite skills / courses?
Programming is a must, user interface and/or game design skills beneficial
Which degree program is this aimed at? (It can be more than 1)
Computer science, games computing, information systems
Number of students you wish to undertake this project

Max 6

Project Name

Games as Research

Project Description:

Using games as a research methodology has seen a growing interest, notably in the field of Human-Computer Interaction. Researchers are developing games that explore non-game-related social, technical, or ethical aspects of human behaviour. They have also been used to create sandboxes for data generation, whereby a “fun” task is given to users that leads to the generation of valuable research data.

What you will do: Design, develop and evaluate a game aimed at either generating a certain form of data or shedding light on some research question. The actual research question would be discussed with the supervisor, with a couple of interesting options available as a starting point.

Are there any prerequisite skills / courses?

Would be easier if you are familiar with some game development platform (e.g. Unity, Unreal Engine). Otherwise additional work would be needed to learn that alongside the project.

Which degree program is this aimed at? (It can be more than 1)

Any.

Number of students you wish to undertake this project

No limit.

Project Name

Games for change

Project Description:

Film and literature have often been used not just to entertain but also to change people's views about the world. In the same vein, video games are gaining acceptance as a fully-fledged art form capable of changing human perception just as much as more traditional media has been doing for decades. This project is about leveraging the medium of games to create thought-provoking pieces that can change our perception of the world, and possibly even our behaviour.

What you will do: Design and develop a game aimed at changing human perceptions of or behaviours in the real world. Then, run a user study to evaluate the effect if any the game has on participants.

Are there any prerequisite skills / courses?

Some game development platform (e.g. Unity, Unreal Engine). Otherwise additional work would be needed to learn that alongside the project.

Which degree program is this aimed at? (It can be more than 1)

Games Computing

Number of students you wish to undertake this project

No limit.

Member of Staff: Patrick Dickinson (also Julia Foecker, School of Psychology)

Subject area: Games

Project Description:

The project involved creating a game to support research in the School of Psychology, and may also involve using EEG brain monitoring equipment. The project being undertaken in Psychology is as follows:

The current research project aims to understand the neural correlates of emotional human voice processing in action video game players. Action video game players are often confronted with aggressive content of body movements or facial and vocal expressions. Here, we aim to understand the neural correlates of affective human voice processing in action video game players when they are asked to attend to one of two spatial locations from which human pseudowords are presented in different emotions. We hypothesize that electrophysiological responses are modulated differently in action video game players compared to non-video game players. We are looking for a student who is motivated in the topic of action video games and who has good programming skills (such as Matlab). Please contact Julia Foecker for further questions: JFoecker@lincoln.ac.uk

If you are interested in working on this project, either contact Patrick for an introduction to Julia Foecker, or you may also contact Julia directly.

our Name: Phil Carlisle (pcarlisle@lincoln.ac.uk)

Link to your staff profile page: https://staff.lincoln.ac.uk/pcarlisle

Any other relevant links to your research:

Complete this form for each project that you propose:

Project Name
Unreal AI Labs Project 1 - Crowds
Project Description:
Unreal Engine comes with two existing crowd agent technologies, one called Reciprocal Velocity Obstacles (RVO) invented by Van Der Burg. The other is called Detour by Mikko Mononen. Unfortunately, it appears that though whoever implemented both of these into Unreal Engine did not understand properly how they are meant to work. As such, the qualities

associated with each implementation are compromised to the point where not many people use either in their games. The aim of this project is to fix the implementation of each by observing the behavior that is meant to be on display (by seeing the implementation work outside of UE4) and then changing the parameterization of the Unreal Engine implementation to make the exhibited behavior the default. Essentially fixing the broken implementations. Then submitting this to Epic as a pull request on Github. You will also be expected to document the correct functionality of each API, for example in a Wiki post on the Unreal Engine Wiki. This could also serve as part of your final report submission.
Are there any prerequisite skills / courses?
You will need solid C++ skills, both in reading existing code and writing new code. Note: this will require perseverance, UE4 is not the smallest codebase and you will be required to familiarize yourself with some of the source code to complete this project.
Which degree program is this aimed at? (It can be more than 1)
Computer Science, Games
Number of students you wish to undertake this project
Any

Your Name: Phil Carlisle (pcarlisle@lincoln.ac.uk)

Link to your staff profile page: https://staff.lincoln.ac.uk/pcarlisle

Any other relevant links to your research:

Complete this form for each project that you propose:

Project Name

Unreal AI Labs Project 2 – Sequencer BML Realizer
Project Description:
Unreal Engine comes with a cinematic sequence editing tool called Sequencer. The aim of this project is to programmatically generate sequencer sequences (like cutscenes) and create tools to enable the creation of sequences of behavior. There exists a language called BML (behavior markup language) that is intended to allow scientific analysis of behavior as well as production of behavior for experimental purposes. The intention here is to take the BML language description and generate sequencer sequences (which can be played back in realtime or rendered out to high quality videos). Naturally nothing is ever easy and one of the more significant challenges here, is the lack of documentation for the sequencer API. As such, a part of this project will be investigating the sequencer code and API and whatever documentation there is. Ideally as a result of the project you will write what you have learnt in a public forum, such as the Unreal Engine Wiki.
Are there any prerequisite skills / courses?
You will need solid C++ skills, both in reading existing code and writing new code. Note: this will require perseverance, UE4 is not the smallest codebase and you will be required to familiarize yourself with some of the source code to complete this project.
Which degree program is this aimed at? (It can be more than 1)
Computer Science, Games
Number of students you wish to undertake this project
Any

Your Name: Phil Carlisle (pcarlisle@lincoln.ac.uk)

Link to your staff profile page: https://staff.lincoln.ac.uk/pcarlisle

Any other relevant links to your research:

Complete this form for each project that you propose:

Project Name
Unreal AI Labs Project 3 – Pose estimator to UE4 LiveLink Plugin
Project Description:
Unreal Engine comes with a system called “LiveLink” which allows the streaming of data from sources such as motion capture suits, into the engine for recording and live use. Similarly, there exists several different libraries that can generate an estimation of a human pose given an input image (from a webcam or film). This project is essentially the development of a Livelink plugin that will allow Unreal Engine to capture the data from the pose estimator, normally through a simple network protocol implementation. As a byproduct of this work, we may also have access to a new motion capture platform that requires similar functionality. But this is currently undecided. Naturally nothing is ever easy and one of the more significant challenges here, is the lack of documentation for the LiveLink API. As such, a part of this project will be investigating the LiveLink code and API and whatever documentation there is. Ideally as a result of the project you will write what you have learnt in a public forum, such as the Unreal Engine Wiki.
Are there any prerequisite skills / courses?
You will need solid C++ skills, both in reading existing code and writing new code. Note: this will require perseverance, UE4 is not the smallest codebase and you will be required to familiarize yourself with some of the source code to complete this project.
Which degree program is this aimed at? (It can be more than 1)
Computer Science, Games
Number of students you wish to undertake this project

Any

Your Name: Phil Carlisle (pcarlisle@lincoln.ac.uk)

Link to your staff profile page: https://staff.lincoln.ac.uk/pcarlisle

Any other relevant links to your research:

Complete this form for each project that you propose:

Project Name
Procedural animation – minimum viable requirements
Project Description:
During GDC in 2014 David Rosen discussed the simple animation models he created for his indie game Overgrowth: “Animation Bootcamp: An indie approach to procedural animation” – see: https://www.youtube.com/watch?v=LNidsMesxSE In this project, you will recreate some of this work in the Unreal Engine, using the animation graph system. The aim of the work is to investigate the “minimum viable requirements” needed in terms of input poses to complete a sophisticated set of expressive behaviors (documentation for these will be provided). You will be expected to explore the functionality of the Unreal Engine animation code, for example the “full body IK” system as a way of supporting the expression. The result being a set of expressions along with some evaluation of the requirements for artist input (poses, animation clips, annotations) in authoring expressive behavior but on a limited art budget typical of “indie” games.
Are there any prerequisite skills / courses?
C++ Programming skills
Which degree program is this aimed at? (It can be more than 1)

Games Computing
Number of students you wish to undertake this project
Any