Editorial

A Happy New Year to all of our readers! In this first issue for 2010, as well as regular features such as 'Meet a Computer Scientist', we have a number of articles that cover various aspects of computer game playing, especially those which focus on games for a younger audience.

You can read about the project '80 Days', of which Leicester is a partner University and has funding from the European Union. This project looks at adaptive interactive storytelling with intelligent teaching methods. It concerns a 14-year old boy who is abducted by an alien scout in a UFO! The boy is asked to help explore the Earth by skillfully flying the UFO to different cities in the world and reporting on its geographical features. In fact this is a key part of a plot to conquer the Earth!

After Easter 2010, the Department of Computer Science will run a Masterclass entitled ‘No Limits? What Computers Can and Can’t Do’. A Masterclass usually consists of either a half or full day visit for around thirty to forty students. We will run a couple of talks, and you can take part in an interactive laboratory where you can see examples of student project work and take part in some computer programming. If you are interested in joining us then please read the iCS article and find out what to do.

Please visit the web sites we point you to, and do some research to discover more about the topics we cover in this sixth issue. We will be pleased to answer your questions, and give advice about your future studies, or your future profession. You can write to us at ics@mcs.le.ac.uk.

I would like to thank our guest writers, and also the members of staff at Leicester who have helped to write for and produce our sixth issue of iCS.
80Days: Around an Inspiring Virtual Learning World in Eighty Days

According to a 2008 survey by the Pew Research Center (Washington, DC), 97% of children between the ages of 12 and 17 regularly play computer, web, portable, or console games. Digital Educational Games (DEGs) can offer exciting and dynamic environments which engage players in meaningful and motivating learning activities and inspire them to explore a variety of topics and tasks. Play is definitely one of the most important psycho-pedagogical concepts; consequently games, when being deployed and integrated in appropriate learning settings, can be effective educational tools.

Driven by the assumption about the educational potential of digital games, an inter-cultural interdisciplinary team comprising computer scientists, graphic designers, pedagogues, psychologists, geographers, and mathematicians have pursued their vision of developing an adaptive DEG for geography. It is realized as a running EU-funded project called 80Days (http://www.eightydays.eu/), which is associated with a famous novel “Around the World in Eighty Days” by the French author Jules Verne.

A 14-year old boy is abducted by an alien scout called Feon in a UFO! The boy is asked to help Feon explore the Earth by skillfully flying the UFO to different cities in the world, and to write up a report about its geographical features. In fact, Feon works for an evil alien general whose plot is to conquer the Earth with a team of alien scouts and highly intelligent alien scientist advisors. Only the first alien scout who hands in a complete report within the time limit is allowed to survive. The boy is in a dilemma. On the one hand, he befriends Feon and wants to help him. On the other hand, he is eager to save the Earth from the alien conquest.

One phenomenon on the Earth that Feon is particularly interested in is that of Natural Disasters. He and the boy fly over Europe searching for one taking place. The boy can communicate with an earthling to get some information. They find a dam that is about to burst – an event that will cause a massive flood. There is conflict between the boy and Feon; the boy is eager to save the local population. However, Feon does not bother to intervene so he can observe what happens. With some tricks, the boy is able to get Feon involved in the rescue. Together they modify the landscape using the UFO’s technologies such as beaming to reduce the adverse effects of the flood.

Finally, the population of the local village is saved. The boy learns some important information about flood prevention. But his relationship with Feon is at stake ….
Scratch is a visual programming language. Although it is simple in comparison to industrial languages such as Java and C++, it still provides a majority of programming control structures. Scratch allows you, the programmer, to create your own interactive stories, animations, games, music, and art and make them readily available over the internet. What is unusual about Scratch is that it is a visual programming language, and the user is guided graphically. Program instructions are coloured and also occupy graphical shapes, and you may only (snap) together instructions into blocks of code if the shapes and colours match up, just like a jigsaw puzzle. Blocks of code also fit together in a sensible way, and this helps to reduce syntax errors. All blocks are detachable and it is possible to move them around and fit them together in new ways to create new programs.

Scratch takes its name from the disc-jockey technique of scratching where a DJ moves a vinyl record back and forth on a turntable while manipulating the cross fader on his or her mixer. Just as the DJ reuses the same sounds on the vinyl all the interactive components of Scratch can be reused in new ways.

Scratch was developed by the Lifelong Kindergarten Group at MIT and is freely downloadable at http://scratch.mit.edu/. There are numerous free Scratch programs available on this website as well.

Within the lifetime of the project, three game prototypes are produced with 10 months in-between each release. The first version was published at the end of February 2009, and has already been tested in several schools in England and Austria using questionnaires and focus-group interviews. The feedback thus gained from the children has been used to help improve the next version of the game. The second version will be ready to be evaluated by February 2010.

If you would like to be involved in evaluating our game prototypes, please contact the 80Days team at the University of Leicester: Dr. Effie Law (elaw@mcs.le.ac.uk) and Dr. Xu Sun (xs47@mcs.le.ac.uk).

What is Scratch?

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Masterclass

On the 28th April 2009 the Department of Computer Science ran a Masterclass. These events provide an opportunity for school and college students to visit a University and engage in talks and other activities. Our Masterclass posed the question “Do you think that computers can do anything you want them to do?” The day began with a short talk entitled “What is Computer Science?” with the discussion led by Professor José Fiadeiro. This was followed up by a laboratory session where our guests were given the opportunity to see, and experiment with, undergraduate Computer Science student projects; these ranged from computer processor simulators to computer games. The processor simulator allows the user to see the main components of a processor and to run simple low level programs, and to watch the binary data moving around the digital circuits. We also provided the opportunity to write simple games using the Scratch visual programming language. After a break for lunch, the Masterclass concluded with a talk which discussed the limitations of computers and the problems that they cannot solve.
of great interest to me! This situation made it particularly exciting! The project was to develop a game which would not require a mouse or keyboard to play it, but would instead be controlled by the user through the use of a webcam. The resulting complexities meant that the game was targeted at youngsters! The player would have to move left or right accordingly to avoid falling rocks. The game features an egg trying to avoid being hit by soldiers made of toast that are throwing rocks.

ICS: How has studying Computer Science at Leicester helped you with your further studies?

Studying Computer Science at Leicester has certainly helped me since it has enabled me to learn a vast amount! Professional, experienced and friendly staff helped me gain a solid understanding of the subject at hand, providing an open and welcoming environment in which I could engage with the staff on a regular basis! Thank you to all those that provided me with help throughout the 3 years of my degree!

Meet a Computer Scientist

Jung Ming Chong’s project – Eggie Egg – is an example of an undergraduate third year project. The third year project is a chance to follow your own interests in depth, with one-to-one supervision. While staff propose a wide range of projects students are also free to come up with their own ideas. Often games are popular with students – Microsoft project prize and May prize winner John Pickering created a Puzzle Game Creator and Solver for a puzzle game known as Slitherlink (other names for Slitherlink include Fences, Loppys, Loop the Loop as well as many others).

Not all projects are games however – Mayur Bapodra modelled equations for chemical reactions, using graph transformation techniques. He continues to develop his project work as a PhD student within the Department of Computer Science. Katerina Argyrou created a website for birdwatchers in the Leicestershire area that shows bird sightings on Google Maps.

Popular recent BSc Computer Science projects have included voice communication over the internet, programming robots, and a variety of sophisticated e-commerce sites, such as stock portfolio managers or car auction sites. More unique projects include software for garden landscaping or a guitar tablature editor.

If you would like to write to us with questions, comments or other matters concerning iCS, please do so at ics@mcs.le.ac.uk. It may not be possible to reply to all correspondence, but whenever we are able to we will do so. To find out more about the Department of Computer Science please visit www.cs.le.ac.uk

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