

Visual Learning Aids for Computer Graphics

Dr Damian Schofield discusses his attempt to enliven the subject of computer graphics to increase student engagement.

What was the learning and teaching challenge that this initiative sought to address?

When I took over the Computer Graphics module within the School of Computer Science, it was a pure theory course focusing on two-dimensional graphical concepts. This is fundamental for computer scientists. However, I wanted to increase student enthusiasm for the topic by pioneering a more 'hands-on' approach. I wanted to retain student interest in computer graphics by providing more interesting alternatives to heavy theory textbooks.

What did you do?

First of all, it was necessary to determine those factors which could be varied within the software to give a better understanding of the theory taught. To this end, an underlying software architecture was developed to allow the students to interact with visual objects and alter the variables selected, based on the theoretical concepts taught in class (colourspace conversions, matrix transformations or resolution parameters, for example).

The next step was to develop the content for the environments which would allow the students to perform this interaction. Some

of the supporting media was already available online to the students as passive web resources. A range of interaction functions was developed, using different interaction metaphors to allow the students to interact freely with the objects. Finally, a mechanism was added for collating data on student use of the system, to allow for the evaluation of the effect of our software on student performance, understanding of theory, and particularly, student enthusiasm.

What were the learning and teaching outcomes?

The visual learning applications are designed to teach the undergraduates about two topics; two-dimensional transformation, and vision as it relates to the anatomy of the eye. Work has been completed on two types of learning object which cover these topics:

- On-line “mini-lectures”, which talk the user through a particular topic while highlighting relevant information on adapted lecture slides.



A representation of the Nottingham Tram using computer graphics

- On-line “interactive learning tools”, which begin by informing the users about a subject, go on to give examples, let the users experiment with changing variables while witnessing the effects, and finally test the user’s knowledge with some multiple choice exercises.

Dr Schofield now works at the University of Adelaide. This article was compiled by Dr Brett Bligh.