PhD Studentship in Interactive Computer Graphics

Department of Computer Science

The Department of Computer Science at the University of Hull (http://www.dcs.hull.ac.uk/) has a University (DCS) PhD scholarship available for the current/next academic session.

Each Scholarship amounts to (per annum) Home/EU Fees plus a stipend of £13290, for a period of three years. Non-EU students may also apply.

If you are looking to pursue a PhD and can start no later than September 2012, consider the PhD project outline below.

This PhD project will undertake research that investigates ways of how to separate the image creation for important and not so important parts of an interactive scene. It will build upon existing work (e.g., Multi-Frame Rate Rendering) for user-interaction-oriented asynchronous methods and concentrate on the support of asynchronous rendering of time-multiplexed user view ports. It is also aimed at practical solutions that employ current and anticipated hardware without imposing new hardware paradigms and/or designs.

Prospective projects that are near variations on this themes are also welcome; although we suggest you contact the supervisor ahead of applying to discuss.

Procedure may be found at:
http://www2.hull.ac.uk/science/computer_science/prospective_students/postgraduate_research.aspx

It is suggested that applications be lodged no later than 1st July 2012.

An application form can be completed online please see the link below

http://www.prospects.ac.uk/cms/ShowPage/Home_page/Apply_online_for_postgrad_courses/University_of_Hull/plefXpmi

Applications will be considered for postgraduate study once this form has been received.

Enquiries may also be made via email to:

Dr Jan P Springer
Or to Dr Darryl N. Davis
Director of Research
Director of Postgraduate Research Studies,
email: j.springer@hull.ac.uk
or d.n.davis@hull.ac.uk
**Title of Project**
Asynchronous Graphics Pipeline

**Supervisor:** (Please indicate 1st and 2nd supervisors)
Jan P Springer (1st supervisor) Warren J Viant (2nd supervisor)

**Co-Collaborators if any:**

**Aim and description of the research**
Interactive and real-time graphics made tremendous progress in the last few years not least because of decreasing hardware costs but also because of paradigm changes in the graphics APIs. With that emerged a stronger need for dealing with flexible graphics pipelines and their main programming abstraction: shader scripts configuring various parts of that pipeline.

However, the term pipeline correctly describes the underlying processing mechanism. Primitives are sequentially processed, which means they may delay the processing of successive primitives. This in turn will lead to longer processing times and also longer times until a new image appears to the user. Those images are usually generated based on continuous user input, but if the time between those input events and the respective feedback in the image takes to long users will be dissatisfied.

This project proposes to undertake research that investigates ways of how to separate the image creation for important and not so important parts of a scene. It will build upon existing work (e.g., Multi-Frame Rate Rendering) for user-interaction-oriented asynchronous methods and concentrate on the support of asynchronous rendering of time-multiplexed user view ports. It is also aimed at practical solutions that employ current and anticipated hardware products, i.e. graphics sub-systems, without imposing new hardware paradigms and/or designs.

**Ability of Project Holder to fund the research** e.g. consumables, equipment, travel
No specialised equipment is required, other than a graphics-capable PC, which is the norm across the SimVis research group.

**Fit to University Strategic Research Themes**
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**Impact and Relevance to REF**
This research further establishes a new rendering paradigm that would impact the interactive entertainment industry as well as existing research in the department, namely the computational steering theme investigated by Dr Helen Wright, and scientific visualization in the larger context, and Dr Qingde Li's research on implicit surfaces and its implications on handling data in CAD and DCC.
software.

This research will also reinforce computer-graphics research in the department and increase its visibility to potential project partners as well as in the international research community.