**COMPUTING HONOURS PROJECT SPECIFICATION FORM**

**Project Title:** A JavaScript Runtime forHardware Accelerated Applications.

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**Supervisor:** Paul Keir

**Moderator:** Mark Stansfield

**Outline of Project:**

The research is to develop a platform that allows GPU centric applications to be written in JavaScript. The platform’s goal is to provide compete bindings to industry standard GPU libraries (OpenCL & OpenGL) to allow developers to experiment and develop hardware accelerated applications in a dynamically typed and flexible language. The platform aims to expand the JavaScript ecosystem of runtimes and provide a workbench for those keen on the performance gains hardware acceleration can bring.

The research will highlight a number of key points. The first showing the speed of compilation and execution of JavaScript. The second showing how leveraging specialised hardware can accelerate traditional applications. Finally, the importance of accelerated programming and JavaScript to the technology sector.

**A Passable Project will:**

* Showcase a generalised GPU demonstration written in JavaScript.
* Will do an analysis of current GPU technologies in JavaScript and how they can be leveraged.

**A First Class Project will:**

* Develop and make available a platform that allows JavaScript developers to write generalised hardware accelerated applications.
* Showcase several generalised GPU demonstrations written in JavaScript.
* Do in depth research into future and current JavaScript technology which enables hardware acceleration.
* Research and demonstrate the advantages of JavaScript over other dynamic languages (e.g. Python) in developing hardware accelerated applications.

**Reading List:**

1. OpenGL Programming Guide: The Official Guide to Learning OpenGL, Versions 4.3
2. Programming 3D applications with HTML5 and WebGL
3. Heterogeneous computing with OpenCL
4. OpenCL Programming Guide

**Resources Required:**

Visual Studio, OpenCL & OpenGL enabled hardware, Chrome’s V8 JavaScript JIT compiler, Git + Github.

**Marking Scheme: Marks**

Introduction 10

Area Overview 15

Requirements and Design 10

Development 30

Project Demonstrations 20

Critical Self-Appraisal 5

Conclusions and Recommendations 10

**Signed:**

**Student Supervisor Moderator Year Leader**

**IMPORTANT: *By signing this form all signatories are confirming that any potential ethical issues have been considered and necessary actions undertaken and that Mark Stansfield (Module Coordinator) and Malcolm Crowe (Chair of School Ethics Committee) have been informed of any potential ethical issues relating to this proposed Hons Project.***