**COMPUTING HONOURS PROJECT SPECIFICATION FORM**

*(Electronic copy available on the Aula Computing Hons Project Site)*

**Project Title: “**Can applying Rust improve reliability in Linux Device Drivers”

**Student:** Kyle Fraser Christie **Banner ID:** B00415210

**Programme of Study:** BSc (Hons) in Computing Science

**Supervisor:** Paul Keir

**Moderator:** Stephen Devine

**Outline of Project:**

Device Drivers within Operating Systems suffer from numerous issues, one of which being the use of unsafe programming languages. This project seeks to test if Rust would be a suitable, safe candidate to replace the C programming language in drivers, exploring exactly how this task might be carried out.

Rust is a young systems programming language with a focus on safety through various features. From it’s compiler to its model of memory management. It is my intent to attempt to write a Linux driver in Rust to test its suitability for applications within drivers. Doing so would allow me to highlight where Rust may make improvements or prevent errors when compared to that of C.

During the project, I also want to gain a fundamental understanding of drivers in their present state. How they are developed, uses, tools and differences between major Operating System vendors. How they link to the Kernel and rest of the OS. I want to utilise this project to thoroughly investigate and highlight the issues surrounding device drivers, discussing previous works that have previously attempted to alleviate driver issues.

Rust continues to grow in popularity and more developers call for it to replace C and C++. It is therefore necessary to test it’s suitability for integration into existing systems and to test if Rust truly has potential to eventually replace such programming languages.

**A Passable Project will:**

**A First Class Project will:**

**Reading List:**

**Resources Required:** *(hardware/software/other)*

Raspberry Pi 400

Desktop Workstation with Linux OS

VirtualBox (as backup for driver development)

RUSTC Compiler

VSCodium Open Source Code Editor

Git

GitHub

**Marking Scheme:**

**Marks**

e.g. Introduction 10

..

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Conclusion 10

Critical Self-Appraisal 5

**AGREED:**

**Student Supervisor Moderator**

**Name: Name: Name:**

**IMPORTANT:**

1. ***By agreeing to this form all parties are confirming that the proposed Hons Project will include the student undertaking practical work of some sort using computing technology / IT, most frequently achieved by the creation of an artefact as the focus for covering all or part of an implementation life-cycle.***
2. ***By agreeing to this form all parties are confirming that any potential ethical issues have been considered and if human participants are involved in the proposed Hons Project then ethical approval will be sought through approved mechanisms of the School of CEPS Ethics Committee.***