CS5199: Individual Masters Project
DOER

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1 Description

This project aims to investigate Dynamic Voltage Loop Scheduling (DVLS) for ARM "big.LITTLE" processors. This will be done by using the gem5 simulator to measure energy consumption and performance impacts. Additionally, an ARM development board will be used to test the software developed on real hardware. The project will involve developing new methods for adjusting the voltage of CPUs in a runtime, e.g. the Linux scheduler or a governor.

2 Objectives

2.1 Primary

- Become familiar with the gem5 simulator.
- Use gem5 to explore the impact that DVLS may have on certain tasks.
- Examine how DVLS may be done automatically in a runtime.

2.2 Secondary

- Implement the DVLS heuristics in the Linux scheduler or implement a governor.
- Analyse the effects of the new runtime using the gem5 simulator.

2.3 Ternary

- Analyse the effects of the new runtime using an ARM development board.

3 Ethics

This project has no ethical concerns. The project will not deal with personal data. Any data used will be entirely synthetic or public domain.

4 Resources

This project will require an ARM development board costing about £50-£100.