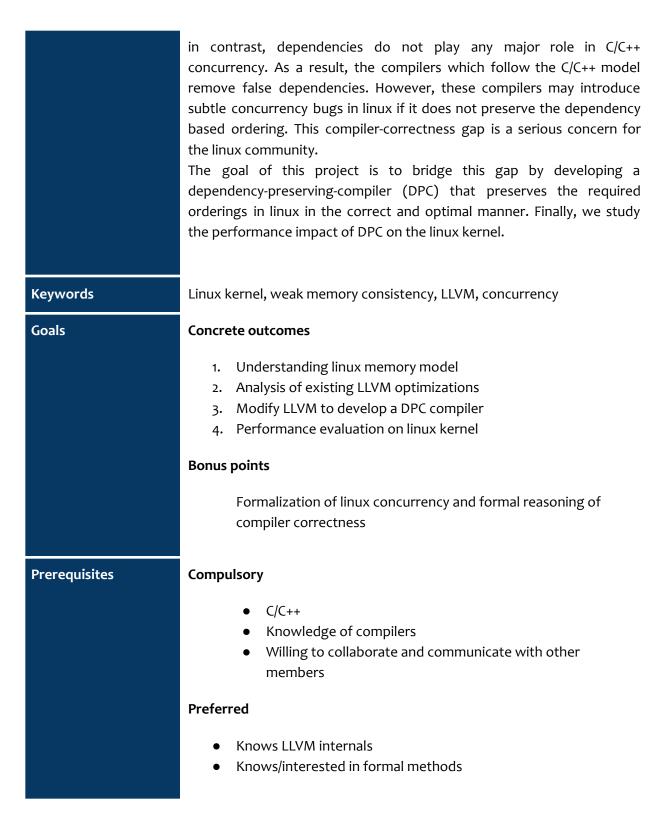


A Dependency-Preserving-Compiler for Linux Concurrency

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Туре	Master / Bach	elor / Guided Research
Description	In recent times weak memory concurrency has emerged as a dominant programming paradigm for modern hardware. Modern hardware performs various optimizations such as out-of-order execution that result in weak memory concurrency behaviors. To exploit the performance opportunities, programming languages and libraries also introduce concurrency primitives that enable efficient concurrent programming. Programming languages like C/C++ provide platform-independent abstractions for writing weak memory concurrent programs. The language specifications have defined the C/C++ memory model and state-of-the-art compilers (e.g. GCC, LLVM) follow the memory model. In parallel, Linux also introduces its own concurrency primitives and memory model to gain Performance improvement. The C/C++ and Linux memory models differ in subtle ways. Linux enforces memory ordering based on dependencies (data, address, control) while,	

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References	 Frightening Small Children and Disconcerting Grown-ups: Concurrency in the Linux Kernel. ASPLOS 2018. <u>https://dl.acm.org/doi/10.1145/3173162.3177156</u>
	 Towards Understandings the Costs of Avoiding Out-of-Thin-Air Results. OOPSLA 2018. <u>https://dl.acm.org/citation.cfm?id=3276506</u>
Application process	 Please send an email to the advisor including the following: Email subject: "Thesis application (DSE)" CV A copy of your transcript(s) A motivation statement, please include samples of your work that you are proud of (e.g., major projects, open-source contributions, Github page, etc.) and/or writing samples (e.g., your technical blog, project reports, etc.)