

# Project proposal (Advanced Computer Architectures)

Static Analysis with LLVM: llvm-mca

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Size of the project: 1-2 student(s)

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## Abstract

This project focus on state-of-the-art tools to perform static analysis on machine code.

Investigate those tools and exploit them to estimate benefits of a given code transformation.

## Pre-requirements

- Intermediate knowledge of C++11 language and idioms
- Basic Linux skills
- [preferred] previous experience with X\_86 assembly code

## Involved Technologies and Frameworks

- LLVM
- C++11

## Detailed description

This project will start from the new tools `llvm-mca`<sup>1</sup> and `llvm_sim`<sup>2</sup>, which are open-source tools developed respectfully by Sony and Google.

The goal of such tools is to provide an estimation of the performance of the machine code before the execution of the code itself.

The goal of this project is to learn to use those tools and investigate the structure of their source code. Apply those tools and/or their APIs to provide an estimation of the benefits (if any) of a given code transformation. The code transformation to be evaluated is performed on the LLVM-IR.

This project can be extended to thesis.

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<sup>1</sup> <https://llvm.org/docs/CommandGuide/llvm-mca.html>

<sup>2</sup> [https://github.com/google/EXEgesis/tree/master/llvm\\_sim](https://github.com/google/EXEgesis/tree/master/llvm_sim)