

## Motivation

Reliable and secure execution of software is a challenging task in malicious environments, especially when physical attacks are considered. Redundancy and checks have to be added to a program in order to permit detection of faults. However, adding this redundancy by hand is both hard and error prone. The goal of this project is to free the programmer from this hassle by implementing the insertion of the error detection technique within LLVM. Various coding techniques (e.g., AN, ANB, ...) as well as checks of program invariants (e.g., MASK) should be considered in order to harden the resulting binary.

## Goals and Tasks

- ▶ Understanding the concepts behind the protection techniques
- ▶ Familiarizing with the LLVM infrastructure
- ▶ Implementation of the techniques in LLVM
- ▶ Analysis of the results and the gained security



LLVM Logo

## Literature

- ▶ [U. Schiffl et al.](#)  
Software-Implemented Hardware Error Detection: Costs and Gains  
[DEPEND 2010](#)
- ▶ [J. Chang, G. Reis, and D. August](#)  
Automatic Instruction-Level Software-Only Recovery  
[DSN 2006](#)

## Deliverables

- ▶ Project files (zip, cleaned)
- ▶ Documentation (pdf)
- ▶ Presentation (pdf)

## Schedule

- ▶ Start Immediately
- ▶ Month 1 Reading literature
- ▶ Month 2 Implementing
- ▶ Month 3 Final deliverables

## Studies

INF    TEL    SW

## Prerequisites

- ▶ C++ programming

## Advisor / Contact

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