Applied Static Analysis 2016

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Overview

Course Content

- **Introduction & Motivation**
- **Basic Terminology**: AST, SSA, Object-/ Field-/ Context-/ Flow-/ Path Sensitivity, (I)CFG, Inter/Intra-procedural analyses, …
- **Code Representations**: Stack/Register based representations (JVM Bytecode, LLVM IR, 3Address Code)
- **Program transformations and native code analyses**: (using LLVM)
- **Concrete static analyses and algorithms**: Call-Graph Construction; Inter procedural data- and control-flow analyses (IDE/IFDS, Points-to analyses, Escape analyses)
- **Applications**: Finding Code Smells, Capability Analysis; Security Vulnerabilities Detection; Dead Paths/Computations

Prerequisites

- A very high degree of interest in reading, analyzing and writing code.
- Basic knowledge in compiler construction is helpful.
- Deep knowledge of object-oriented programming concepts and in particular of object-oriented programming in Java is required.
- Interest in learning new programming languages (in particular Scala) is required.

Organization

- The lecture/exercise will always be Thursdays from 1:30pm to 3pm in S202/C205.
- We will use the Fachschaft's forum for announcements.
  https://www.fachschaft.informatik.tu-darmstadt.de/forum/viewforum.php?f=581
- The slides can be downloaded from our GitHub page.
  https://github.com/stg-tud/apsa

Exam

- The exam will be a closed-book exam shortly after the last lecture: Th, Jul. 28th, 2016, 12:00-14:00 (S101/A01 - *may change*).
- The exam will take 60 min.
- (There will be no bonus (points).)