

Overview

Wei Le

August 22, 2022

"Science attempts to find logics and simplicity in nature; mathematics attempts to establish order and simplicity in human thoughts"

- Edward Teller

Program Analysis

Analyzing **programs** to predict values and identify properties; programs exist in the following format:

- ▶ source code
- ▶ binary code
- ▶ execution traces
- ▶ runtime products: e.g., data structure access pattern in the heap memory
- ▶ software repositories: e.g., bugs, patches, makefile, tests
- ▶ machine learning code and trained models

This area interfaces with discrete maths, AI algorithms, graph algorithms, programming languages and compilers, security

Course content and syllabus

- ▶ terminologies and concepts in program analysis and software engineering
- ▶ program representations
- ▶ program analysis algorithms
- ▶ big ideas: abstraction (e.g., group values) - to address state space issues
- ▶ applications: quality assurance of software engineering and AI-engineering
- ▶ dataset and tools
- ▶ examples
- ▶ research frontier and problem solving

How do I run the course

Syllabus