Automated Software System Analysis and Testing

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Research projects

- Automated software testing
- Automated software analysis
- Model-driven software engineering and testing
Automated Software Testing

- Automated test data generation
  - Automated generation of test data that satisfy testing criteria
- Search-based software testing
  - Search methods that identify program properties, e.g., buffer overflow
  - Directed search techniques
    - hill climbing
    - genetic algorithms
    - data-dependence based search
    - ...

Automated Software Analysis

- Methods of automated detection of security threats in source code
  - Buffer overflow
  - Invalid memory access
  - ...

- Program slicing: a reduction technique
  - Static slicing: source code slicing
  - Dynamic slicing: program execution slicing
Model-driven software engineering and testing

- Model-driven development
  - Executable models
  - Model slicing

- Model-driven testing
  - Model-based testing
  - Model-based test prioritization