UNIVERSITÄT PADERBORN

Software Engineering

Landscape depending parameter tuning for search-based software testing

Overview

1. Introduction
2. Fundamentals
3. APC-DynaMOSA
4. Evaluation
5. Evaluation
6. Conclusion

Introduction

- Unit tests
- maximize coverage (line, branch, exception)
- lack of sufficient tests
- costly and time-consuming
- => use search-based software testing

Motivation

- Tools... => EvoSuite state-of-the-art
- may not terminate => search budget
- optimal only with optimal configuration
- No Free Lunch theorem
  - impossible to find optimal configuration for all problems
- EvoSuite's default configuration is fairly good, but not perfect

Research goal

- wide variety of problem-cases
- concept landscape depending
- adaptive
- parameter control

State-of-the-art

Challenges

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Delimitation

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Search-based software testing

- tests for object oriented languages
- sequence of method calls
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Fitness

Fitness function

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- function for e.g. coverage
- guidance for search algorithms
-
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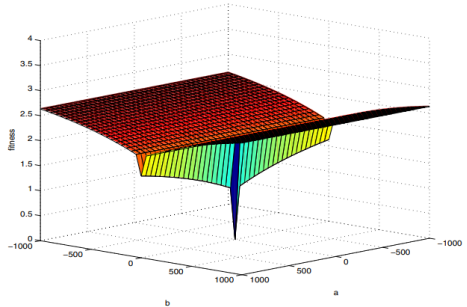
```
1 void bar(int x) {
2     if (x == 1) {
3         // uncovered code
4     }
5 }
```

Fitness

Fitness landscape



Genetic algorithm

Heading

- Statement
- Explanation
- Example

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DynaMOSA

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Concept

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Landscape analysis

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Targets

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Classification

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Parameter selection

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- Example

Motivation

Heading

- Lorem ipsum dolor sit amet, consectetur adipiscing elit
  1. Aliquam blandit faucibus nisi, sit amet dapibus enim tempus eu
- Aliquam blandit faucibus nisi, sit amet dapibus enim tempus eu
- Nulla commodo, erat quis gravida posuere, elit lacus lobortis est, quis porttitor odio mauris at libero


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