### Software Product Lines

11. Product-Line Testing

Thomas Thüm

November 30, 2021

# Overview – 11. Product-Line Testing

### Combinatorial Interaction Testing

Motivation
Pairwise Interaction Testing
A Greedy Algorithm
Meta-Heuristic Search
T-Wise Interaction Testing
Effectiveness of Combinatorial Interaction Testing
Efficiency of Combinatorial Interaction Testing
Summary

#### Solution-Space Sampling

Coverage in Single-System Engineering Coverage of Ifdef Blocks

Presence-Condition Coverage Encoding Solution Space in Feature Models Overview on Coverage Criteria Overview on Input for Sampling Algorithms Summary

### Sampling without Coverage

Random Sampling
Uniform Random Sampling
Automation in Product Sampling
Expert Knowledge in Sampling
Testing the Linux Kernel
Missing: Test-Case Selection/Generation
Summary

# Lecture Overview – 11. Product-Line Testing

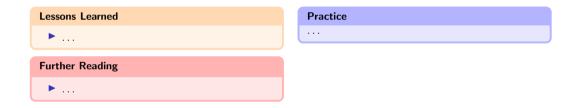
#### Combinatorial Interaction Testing

Motivation
Pairwise Interaction Testing
A Greedy Algorithm
Meta-Heuristic Search
T-Wise Interaction Testing
Effectiveness of Combinatorial Interaction Testing
Efficiency of Combinatorial Interaction Testing
Summary

Solution-Space Sampling

Sampling without Coverage

# Summary – Combinatorial Interaction Testing



### Lecture Overview – 11. Product-Line Testing

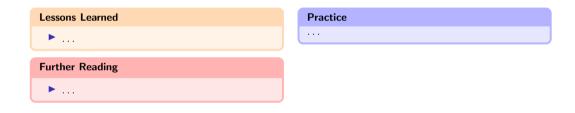
#### Combinatorial Interaction Testing

#### Solution-Space Sampling

Coverage in Single-System Engineering Coverage of Ifdef Blocks Presence-Condition Coverage Encoding Solution Space in Feature Models Overview on Coverage Criteria Overview on Input for Sampling Algorithms Summary

Sampling without Coverage

# Summary – Solution-Space Sampling



# Lecture Overview – 11. Product-Line Testing

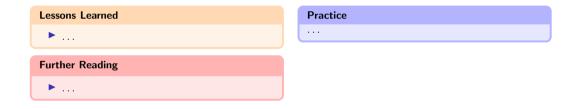
Combinatorial Interaction Testing

Solution-Space Sampling

### Sampling without Coverage

Random Sampling
Uniform Random Sampling
Automation in Product Sampling
Expert Knowledge in Sampling
Testing the Linux Kernel
Missing: Test-Case Selection/Generation
Summary

# Summary – Sampling without Coverage



# Overview – 11. Product-Line Testing

### Combinatorial Interaction Testing

Motivation
Pairwise Interaction Testing
A Greedy Algorithm
Meta-Heuristic Search
T-Wise Interaction Testing
Effectiveness of Combinatorial Interaction Testing
Efficiency of Combinatorial Interaction Testing
Summary

#### Solution-Space Sampling

Coverage in Single-System Engineering Coverage of Ifdef Blocks

Presence-Condition Coverage Encoding Solution Space in Feature Models Overview on Coverage Criteria Overview on Input for Sampling Algorithms Summary

### Sampling without Coverage

Random Sampling
Uniform Random Sampling
Automation in Product Sampling
Expert Knowledge in Sampling
Testing the Linux Kernel
Missing: Test-Case Selection/Generation
Summary