Software Product Lines

4. Feature Modeling

Elias Kuiter

December 1, 2021

Overview – 4. Feature Modeling

Feature Models

Implicit Knowledge About Features Features in Industrial Practice Feature Models and Configurations Summary

Representations and Translations

Feature Diagrams Propositional Formulas Transforming Diagrams into Formulas Other Representations

Summary

Automated Analyses

Inconsistencies in Feature Models
Valid Configurations
Void Feature Model
Core and Dead Features
Edits to Feature Models
Other Analyses
Tool Support
Summary

Lecture Overview – 4. Feature Modeling

Feature Models

Implicit Knowledge About Features Features in Industrial Practice Feature Models and Configurations Summary

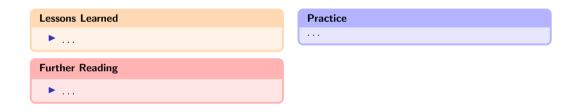
Representations and Translations

Automated Analyses

FEATURE: should be defined in intro chapter is "feature" already defined/explained at this point? usually, features are not modeled explicitly (tacit knowledge / lost in code) = ¿ pros/cons better: Excel table of products or features/dependencies give some experience reports/motivation from practice (Berger et al) (maybe mention Marlin case study about Feature Location?) even better: show examples of structured configuration processes (eg. subway, Linux)

then define feature model + configuration and give examples

Summary – Feature Models



Lecture Overview – 4. Feature Modeling

Feature Models

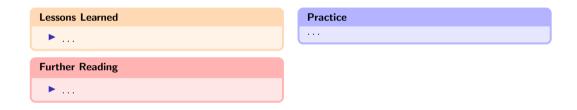
Representations and Translations

Feature Diagrams
Propositional Formulas
Transforming Diagrams into Formulas
Other Representations
Summary

Automated Analyses

```
show running example as a feature diagram with cross-tree-constraints explain notation lego example? discuss pros/cons why is this needed? (forward ref?) show running example as a formula explain intuition behind elements of formula formal algorithm for transformation into FOL (and then CNF?) + example list of products, excel sheet, no explicit model (in motivation?), grammars, ... variations of feature models (e.g. cardinalities, non-boolean) discuss pros/cons
```

Summary – Representations and Translations



Lecture Overview – 4. Feature Modeling

Feature Models

Representations and Translations

Automated Analyses

Inconsistencies in Feature Models Valid Configurations Void Feature Model Core and Dead Features Edits to Feature Models Other Analyses Tool Support Summary show examples of inconsistencies/anomalies in feature models (interaction?) slide on SAT solving maybe omit?
e.g., partial configurations, model counting

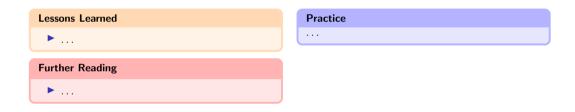
show how FeatureIDE automatically detects the anomalies from the beginning

other questions about feature models

FeatureIDE configurator

Elias Kuiter

Summary – Automated Analyses



Overview – 4. Feature Modeling

Feature Models

Implicit Knowledge About Features Features in Industrial Practice Feature Models and Configurations Summary

Representations and Translations

Feature Diagrams Propositional Formulas Transforming Diagrams into Formulas Other Representations

Summary

Automated Analyses

Inconsistencies in Feature Models
Valid Configurations
Void Feature Model
Core and Dead Features
Edits to Feature Models
Other Analyses
Tool Support
Summary