Learning Model-Driven Engineering Tasks from Examples
Representativeness and Generalizability
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A generic framework to study the inductive capacity of model-sets in MDE

Model-set generation
Existing approaches
- Gather existing models (examples)
- Use prototypical examples provided by experts
- Lack of representativeness
- Impact the quality of the learned automation knowledge
- Automated model-set selection
- Characterization and control of models-sets production
- Exploration of horizons wider than experts/modellers

Why Learning MDE Tasks ?
- Domain expert
  - Good domain knowledge
  - Ability to discriminate between good and bad models
  - Ability to provide examples
  - Difficulty to write automated tasks
- Computer expert
  - Ability to write automated tasks
  - Limited domain knowledge

References and published works

Learning Model-Driven Engineering Tasks
from Examples
Representativeness and Generalizability

Representativeness and Generalizability
Quantification of an example set’s capacity to support qualified knowledge derivation

Empirical Evaluation

Output precision

Well Formedness

Transformation

Comparison of task outputs

INvalid

Valid

Output

In the input model-set

Example

Task

Model Generation

Model Transformation

Random Instantiation

NSGA-II

Multi-objective genetic algorithm

Objectives
- Coverage
- Size

Model Set Selection

Near-optimal model set
Small set of models covering at best the metamodels constructs

Output precision

Well Formedness

Task Learning

Transformation

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Solution Space
Definition

Knowledge Abstraction

Specific Knowledge

Manual completion
What is the expected output associated to a known input ?
- Learning Well formednessRules:
  - Valid and invalid examples
- Learning Transformation:
  - Provide expected output model

Manual completion

Partial examples

Complete examples

Manual Examples’ Completion

Output Precision

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Representativeness and Generalizability
Quantification of an example set’s capacity to support qualified knowledge derivation

Coverage level of input models
Representativeness of example set

Quality of the task learned
Inductive capacity of example set

Empirical Evaluation

References and published works