Towards flexible and efficient model-based testing, utilizing domain-specific modelling

DSM workshop / SPLASH 2010
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Model-Based Testing

- **Modelling**
  - Relevant data but high abstraction level

- **Test generation**
  - Using several algorithms for test generation and formatting the output

- **Test execution**
  - Running tests in a test bed and creating a report
Utilizing DSM in Model-Based Testing

- Using advantages of DSM in MBT
  - Rapid modelling
  - Domain expert as a modeller
  - Model as a document
  - Etc..

- Two approaches
  - Generate test model for an MBT tool
  - To write own algorithms that use pure DSM as a source
Utilizing DSM in Model-Based Testing

Do-It-Yourself

Utilizing existing MBT tools
Modular Model-Based Testing

- To use DSM as a user interface for system description enables
  - changing generator during software lifecycle
  - use of many test generators
  - writing your own test generator
Case Study: SIP Protocol

- SIP is a Session Initiation Protocol
Case Study: SIP Modelling Language
Case Study: SIP Protocol Testing

- In our case study we generated test cases using:
  - ModelJUnit, an open source MBT tool
  - Conformiq Qtronic, a commercial MBT tool
  - A self-written test generator
SIP model

Case Study: ModelJUnit

- ModelJUnit model
- TTCN-3 tests

Model transformation

- Open source
- Model is java class

Test generation
Case Study: Conformiq Qtronic

SIP model

- Commercial tool
- Model:
  - java + UML state machine
- Plug-ins for formatting output

TTCN-3 tests

Model transformation

Test generation
Case Study: Do-It-Yourself

- Algorithm written in MERL

TTCN-3 tests

Test generation
Conclusions

- DSM with MBT enables one to
  - Change test generator during software lifecycle
  - Use many test generators
  - Write your own test generation algorithms

- It works in our small case study
  - Next we will put it in real industrial cases
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