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Automatically Testing Graphical JAVA User Interfaces

Challenges and Solutions

by Reginald Stadlbauer

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About me

- Reginald Stadlbauer <reggie@froglogic.com>
- Co-founder and CEO of froglogic GmbH, Hamburg, Germany
- Specializes in automated user interface testing
- Former Senior Software Architect at Trolltech ASA

Agenda

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- Overview
- Motivation
- Challenges
- Solutions
- Practical Demonstration
- Q & A

Types of Testing

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- Unit Testing
- Performance Testing
- ...
- Functional GUI Testing
  - Black Box Testing
  - Assume user's point of view
  - Automate to spot regressions
  - Combinable with profiling tools

Terminology

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- AUT – Application Under Test
- SUT – System Under Test

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Why Automate?

- Faster
  - Get results quicker
  - Run more tests in the same time
- Trivial to replay in different configurations
- Reliable and reproducible
- Relieve testers from monotonous tasks

What *Not* to Expect from Automation

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Don't expect

- **To get rid of all your testers**
- **A tool *writing* tests automatically for you**
- **100% automation**

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Challenges of Automated GUI Tests

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- Variety of toolkits and controls
  - Need toolkit specialization
- Evolution of application and toolkit
  - Need abstraction layer
- Event driven, asynchronous program flow
  - Need synchronization and exception handling
- Dynamic layout
  - Need robust object identification/interaction

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Solutions

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Means to be robust against AUT changes:

- **Built-in knowledge of JAVA GUI toolkits**
  - **Object hierarchy, properties, etc.**
  - **Identification of controls vs. low-level coordinates**
- **Provide tester with full access to JAVA API**
- **Functions for test synchronization**

Toolkit Abstraction

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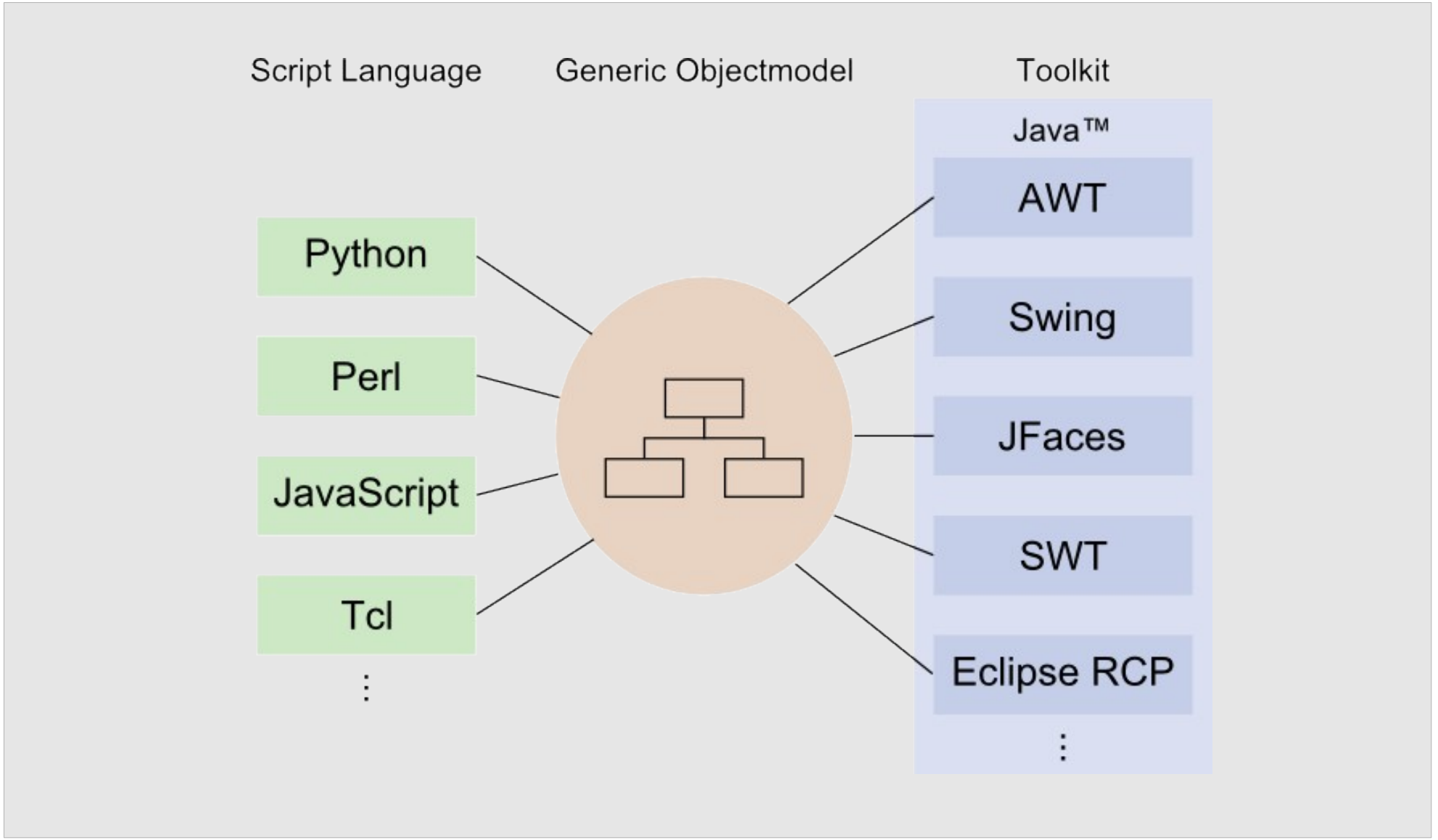

Automatically Testing Graphical JAVA User Interfaces

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- Dedicated support for JAVA toolkits
  - Swing/AWT/JFaces and SWT/Eclipse Rich Client Platform (RCP)
  - APIs for supporting custom widgets
- Cross-platform (Windows, Linux/Unix, Mac OS X)
- Open for integration into existing environments
- Additional support for other GUI technologies
  - Web/AJAX/DHTML, C++ Qt, Mac OS X Carbon/Cocoa, Tk, Four J's Genero, XView, ...

Automatically Testing Graphical JAVA User Interfaces

Squish® Features

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- Choice of test scripting languages (JavaScript, Perl, Python, Tcl, TSL)
- Record or manual code (usually a combination of both)
- Record high-level actions instead of generic low-level, coordinate based events
- Test debugging and verifications
- Squish IDE and command line tools

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Practical Demonstration

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- Recording a test (high-level actions)
- Inserting verifications
- Ensuring synchronization
- Re-factor common actions into functions
- Separate test logic and data (data-driven testing)
- Run in different configuration
- Unattended execution (automation)

Data-Driven Testing

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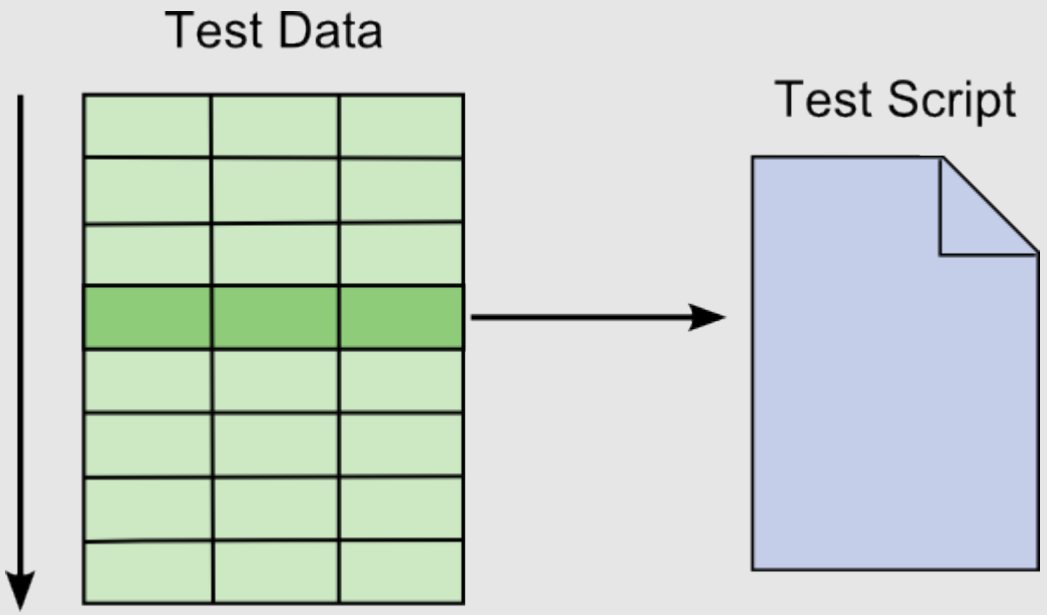

Data-Driven Testing

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Benefits:

- ➥ **Clean separation between test data and test logic**
- ➥ **Easily extensible tests**
- ➥ **Frees domain expert from programming tasks**
- ➥ **Helps with future portability**

Unattended Testing

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- Using command line tools
- Control from one machine running tests on different systems
- Use Unix cron jobs, Windows Services or test management systems (e.g. Eclipse TPTP, Mercury Quality Center)
- Post-process results (XML, HTML, XLS, etc.)

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More about Squish at www.froglogic.com

Get an evaluation at www.froglogic.com/evaluate

or visit our booth!

Thank you for your attention!