Pounamu Developments

- **Aim of section:**
  - Look at work undertaken to extend Pounamu core features (recent and current)
  - Problems being addressed and solutions adopted

- **Contents**
  - Core model
  - Behaviour specification
  - Back end code import/export
  - External interface
  - Collaboration/awareness
  - Front end improvements

**Core model**

- **Problems**
  - Weak type support (strings and collections of strings)
  - Weak relationship support in metamodel (no cardinalities, no inheritance, no explicit repn of links)

- **Solutions**
  - Addition of type suite including user defined types
  - Consequent changes to property sheet definer
  - Addition of better relationship support

- **Status**
  - Underway

**Behaviour specification**

- **Problems**
  - Event handler specification tool requires sophisticated user
    - Understanding of Java
    - Familiarity with Pounamu API
  - Difficult to debug

- **Solutions**
  - Kaitiaki visual event handler specification tool (Karen Liu PhD)
    - Aimed at handlers for view manipulation
    - Debug view
  - Metamodel constraint language
    - Like OCL for specifying computations at meta model level (like spreadsheets at a type level)

- **Status**
  - Both projects at design/early prototype stage

**Kaitiaki**

- Dataflow metaphor, but includes data push and pull
- Includes shape representations to give clarity
More complex example

- Parameterised subtasks
- Creation of new objects or connectors
- Alignment etc

Kaitiaki Debug view

Back end code import/export

- Problem
  - Backend code generation and code import facilities require bespoke code for each generator/importer
- Solution
  - Develop framework for code import and export tools - Sydney Xing 380 and 780 projects
  - Framework for export plus exemplar for export to XMI
  - Framework for import plus exemplar for XMI import
- Status
  - Proof of concept implementation done
  - Additional exemplar for AOCE tool being developed (Max Wang)
**External interface**

- **Problems**
  - Need to access Pounamu tools remotely on a variety of different devices

- **Solutions**
  - RMI interface to Pounamu API (Therese Helland project - done)
  - Thin client interface for web browser interaction with any Pounamu generated tool (Penny Cao MSc thesis done)
  - Mobile phone interface for Pounamu generated tools (Joe Zhao MSc thesis done)
  - Generalise framework and add VRML interface (Joe Zhao current)
  - Add games engine interface (Mek Bhumiwat & Joseph Shi SE project current)

**Thin client interface**

- Developed by Penny Cao (MSc thesis)
  - Uses Web services API to generate GIF or SVG versions of Pounamu model views (model only, not tool specific)
  - Can interact with these to perform editing actions
  - Support multi-user interaction with Pounamu tools

**MUPE interface**

- Support for viewing and editing Pounamu tool views on cellphones
  - Uses Nokia’s MUPE open source mobile collaboration server plus MUPE client on phone
  - Has several features for semantic zooming to allow diagrams to be sensibly visualised/edited on small screen
Example MUPE interface usage

Element zooming and overview

Collaboration & group awareness

- **Problems**
  - Want to use Pounamu tools in collaborative situations & hence need support for both synchronous and asynchronous collaboration

- **Solutions**
  - Web service based collaboration plug in provides synch and asynch multi user support (Akhil Mehra project)
  - Web service based group awareness plugin extends this to provide visual indication of other users' actions when collaboratively editing (Akhil Mehra MSc thesis)
  - Web service based CVS interface provides versioning support. Combined with visual diff tool, provides support for asynch group awareness (Akhil Mehra MSc thesis)

Collaboration architecture
Front End Improvements

- **Problems**
  - Need for base set of shape primitives etc
  - Need to be able to deal with large diagrams
  - Numerous usability issues that are (generally) of low priority but require attention
    - Eg diagram in diagram

- **Solutions**
  - Shape primitives (Xiaomin Tian Project)
  - Zoomable User Interfaces (Karen Liu summer project)
  - LIDS pen based interface (building on Qi Chen’s MSc thesis)
  - On going list of “things to do” (Nianping Zhu, project students, current/future)
Sketch interface

Summary

- Pounamu is an evolving tool that has itself been developed out of earlier tool projects (MViews, JViews)
- Very much a research prototype to provide proof of concept implementation of research ideas
  - However, now developed to a level of semi-robustness
  - Third year of use in 732!
- Plenty of scope to undertake projects/theses developing or applying Pounamu