Multi-platform Processor Framework for Data Analysis, Data Acquisition and Simulation

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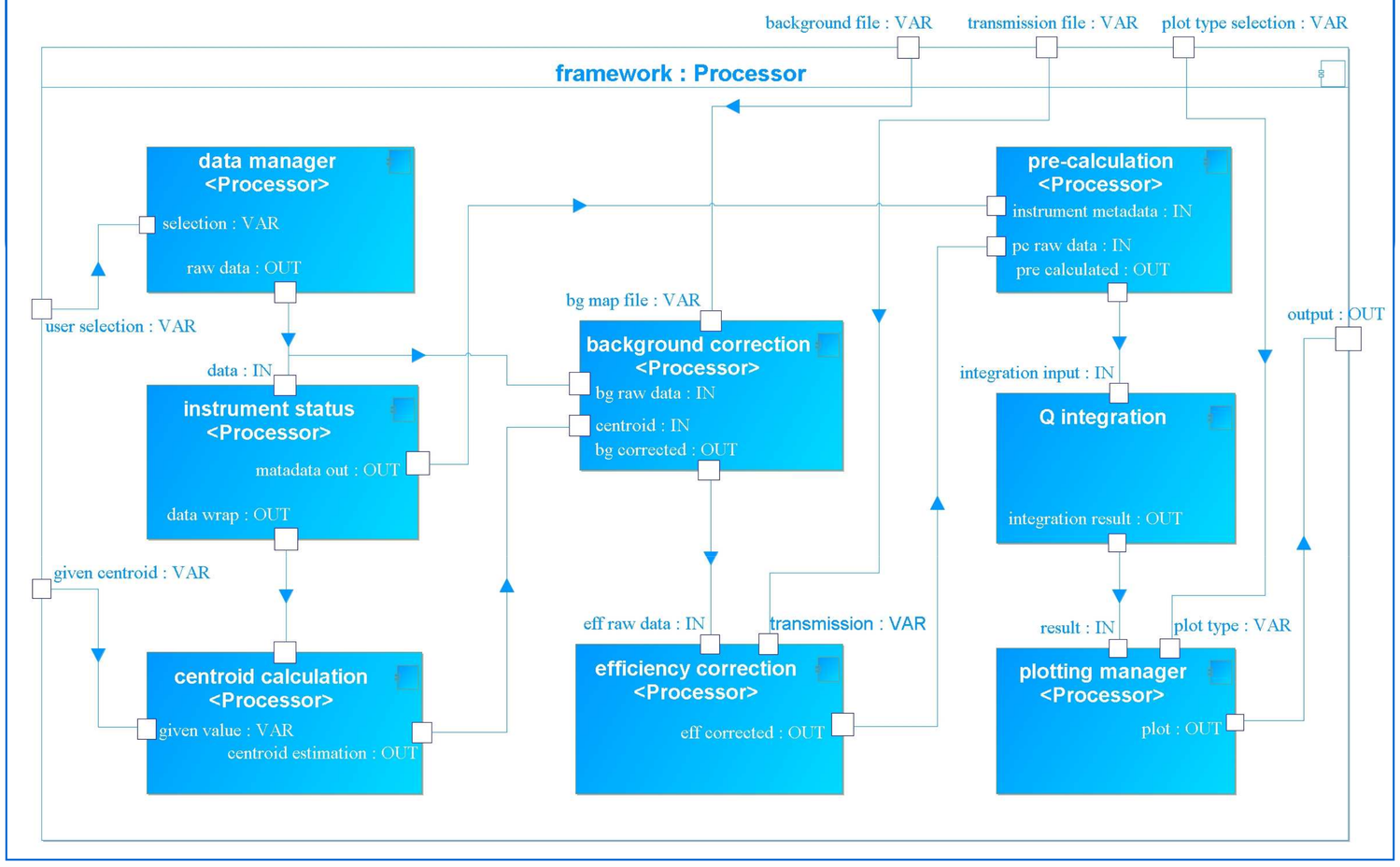
The Mission

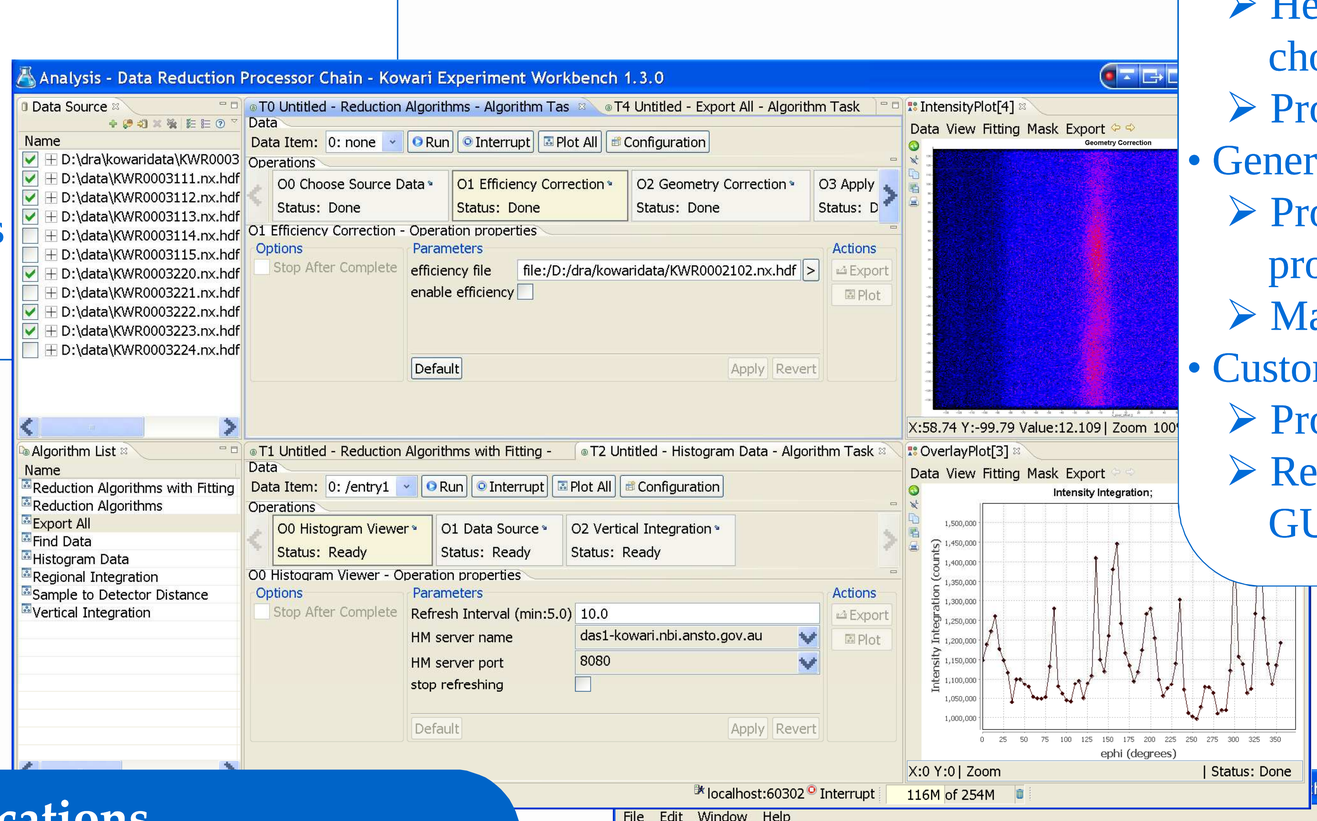
- Simplify scientific software development and deployment
- Contribute algorithms at runtime
- Support multiple computing languages
- Generate GUI elements automatically
- Reuse sharable libraries
- Feature a common sense user interface

Processor Chain of SANS Data Reduction



Processor Framework

- Concept
  - Chain together visual blocks to perform a variety of tasks
  - Support contribution of processors and processor chains at runtime
- Structure
  - Processors – visual wrappers of code blocks to carry out unit tasks
  - Ports – interface to access fields of processor
  - Connectors – links between ports to make information flow
  - Composite processors – processors that hold other processors
  - Frameworks – the shells of processor chains



Graphical User Interface

- Design Interface
  - Help user to contribute code in a choice of programming languages
  - Provide visual tools to define chains
- Generic GUI
  - Provide graphical elements for processor blocks automatically
  - Manage data and plots
- Custom GUI
  - Provide fixed user interfaces
  - Reuse visual elements from generic GUI

Applications

- Data Analysis for Neutron Scattering Instruments
  - Quokka – small angle neutron scattering
  - Kowari – residual-stress diffractometry
  - Echidna – high-resolution powder diffractometry
  - Wombat – high-intensity powder diffractometry
- Data Acquisition
  - Access to histogram data
  - Design and perform scattering experiment
  - Instrument alignment
  - Real-time data acquisition and reduction
- Language Supported
  - Java, Beanshell scripting
  - Python