Model-based Development and Verification for Software-Intensive Systems
Event-B and the Rodin Platform

Event-B is a formal method for system-level modelling and analysis. A key feature of Event-B is the use of refinement to represent systems at different abstraction levels from system-level functional and safety requirements down to detailed component designs. Mechanised proof and model-checking are used to verify consistency and provide traceability between modelling levels.

The Rodin Platform is an Eclipse-based IDE for Event-B that provides effective support for refinement and verification. Rodin is open source and is further extendable with a range of plugins including graphical UML-based modeling, model-checking, simulation, requirements traceability and code generation.

Technological advantages
- Traceable model-based development and verification from conception to certification
- Supports DO-254/178C flows for design assurance of airborne electronic hardware and software
  - DO-331 addressing Model-based development and verification
  - DO-333 addressing Formal Methods to complement testing
- Formal proof, model checking, model-based testing, graphical animation
- Hybrid discrete/continuous multi-simulation supporting the FMI standard
- Combines formal and simulation-based verification with MC/DC coverage closure

Technology roadmap
Demonstrated world’s first > 1 kW diffraction-limited fibre laser
Currently working on:
The development of Rodin is supported by the EU ICT Project ADVANCE, http://www.advance-ict.eu, (2011 to 2014). Originally Rodin development was funded by the European Union Project DEPLOY (2008 to 2012) and RODIN (2004 to 2007).
- December 2013 - adopts the Functional Mockup Interface (FMI) standard for multi-simulation
- June 2014 - supports Model-based testing and MC/DC coverage
- December 2014 – fully integrated proof, model checking and multi-simulation in a model-based development and test environment

Collaboration opportunity
Rodin is already being applied to large-scale industrial developments in the railway, smart grid, defence and automotive domains. We are interested in collaborative R&D projects involving the incorporation of Rodin into industrial design and certification flows. Commercial services are available for Rodin training, plug-in development and consultancy.

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