A Practical Integration of Formality into the Software Process

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This tutorial will explore a practical approach to incorporating formal techniques within existing software engineering processes. It is aimed at organizations that want a practical way to integrate some formality into their existing software development process (e.g. if an aspect of the development is safety critical, mission critical or cost critical) without having to abandon their current practices.

Formal techniques are indispensable for requirements formalization and hazard management, but can be applied profitably to any software development project. The tutorial will show how the level of formality adopted in a particular project can be tailored to the needs of the project without affecting other aspects of the development process.

To illustrate this integration, the tutorial will introduce the Object-Z formal specification notation and show how a Requirements Formalization process unit can be incorporated within the MeNtOR software development process. A hazard management process unit within MeNtOR, that applies the Requirements Formalization process unit, will also be discussed. Tutorial attendees need no prior experience with Object-Z or MeNtOR.

Dr. Roger Duke is associate professor in the School of Information Technology at the University of Queensland. Over the past nine years, Roger’s main research and teaching interests have been in the application of formal methods in software engineering. He is a member of the team developing the specification language Object-Z, a language designed to facilitate the specification of systems in an object-oriented style. Current work, sponsored by the Australian Research Council, involves the integration of formal techniques within existing software engineering processes.

Craig Mann is a Director of Imaginar Technology Pty Ltd. He works closely with Object Oriented Pty Ltd. in consulting and delivering training courses on topics including UML, MeNtOR, Java and Smalltalk. Craig has worked extensively in both industry and academia. From 1990-93 he worked as an associate lecturer at Griffith University. From 1994-95 he worked with Object Oriented Pty Ltd. in the Sydney office. During this time he was actively involved in the development of MeNtOR, a software development process architecture. Craig is currently completing a Ph.D. at the Software Verification Research Centre, University of Queensland, on the integration of the formal specification language Object-Z with MeNtOR through the development of a set of formal specification processes.