

## Keynotes

**Title: “Case study research in software engineering: How to generalize, how not to generalize, and how not to generalize too much.”**

Roel Wieringa

Case studies are detailed studies of a small number of real-world cases in order to understand the mechanisms that play a role in creating phenomena in the case. The case research methodology originated in the social sciences but is now increasingly often used in empirical software engineering too. In this talk I will show what role case studies play in the problem investigation and artifact validation tasks of the design cycle, giving examples of the various kinds of case studies that can be used in these tasks: observational case studies, problem-driven action research, and technical action research. Second, I will discuss how to generalize from case studies: by architectural similarity. A case-based generalization says that in cases with similar architecture, similar mechanisms will occur that produce similar phenomena. Support for such generalization can be acquired by a process of analytical induction. This is contrasted with statistical inference, which is sample-based and produces generalizations about the statistical distributions of variables. Both kinds of inferences are non-deductive, which means they may lead to false conclusions from true premises. In the talk I will discuss the strengths and weaknesses of both kinds of generalization.

### Speaker Biography



Roel Wieringa (<http://www.cs.utwente.nl/~roelw>) is Chair of Information and Software Systems Engineering at the University of Twente, the Netherlands. His research interests include modelling and design of e-business networks, requirements engineering, and research methodology for software engineering, information systems and the design sciences. He has written two books, *Requirements Engineering: Frameworks for Understanding* (Wiley, 1996) and *Design Methods for Reactive Systems: Yourdon, Statemate and the UML* (Morgan Kaufmann, 2003). His book *Design Science Methodology for Information Systems and Software Engineering*

will appear in 2014 with Springer.

## **Title: “Awareness and Comprehension in Software/Systems Engineering Practice and Education”**

Cláudia Maria Lima Werner

The creation of tools, techniques and methodologies for manipulating large data sets has been receiving special attention of both scientific and industrial communities, aiming to discover new ways of dealing with the underlying information for supporting decision making. However, making use of computing resources to enhance awareness and understanding of software information and the software itself is still a challenge, which involves the identification of suitable mechanisms, adequate abstractions, and studies on stimulation of the human perceptive and cognitive abilities. Software Visualization, an Information Visualization subarea, has its research focus on the use of computational resources to augment perception, comprehension and assimilation of software information and the software itself by the user. This talk aims to discuss the Software Visualization area, including some of its concepts, techniques, and applications in Software/Systems Engineering, besides presenting ongoing research at COPPE/UFRJ and some challenges identified in this context.

### **Speaker Biography**



Cláudia Maria Lima Werner received her D.Sc. from COPPE/UFRJ (1992) (the Graduate School of Engineering of the Federal University of Rio de Janeiro, Brazil) and since 1994 is an Associate Professor of the Computer Science Department, being the leader of the Software Engineering group, at COPPE/UFRJ. She is also a CNPq researcher, having experience in Software Engineering for more than 15 year, with emphasis in Software Reuse, Software Development Environments, Component Based Development and Software Product Line. She has been involved in the visualization area since 2008 and is the coordinator of the Virtual Reality Laboratory (Lab3D) at COPPE/UFRJ. She has over 200 technical papers published in national and international conferences and journals, besides book chapters. She is a member of the Brazilian Society of Computer Science (SBC) and the program committee of various national and international conferences, and also co-editor-in-chief of the Springer Journal of Software Engineering Research and Development (JSERD). Website: <http://www.cos.ufrj.br/~werner>.

**Title: “The ALMA Software Release Management Process. Integrating and deploying an specialized end-to-end system.”**

Jorge Ibsen

The ALMA Software is in daily use at the ALMA Observatory and has been developed as an end-to-end system including: proposal preparation, dynamic scheduling, instrument control, data handling and formatting, data archiving and retrieval, automatic and manual data processing, and support for observatory operations.

With the start of ALMA Early Science (ES), it became evident that the bi-yearly software release cycle in use up to 2011 introduced a significant amount of complexity in the software delivery process. Software deployment was seen as big-bang events with a large number of new features being introduced all at once, which needed to be tested and commissioned during time windows spanning only couple a few weeks. Moreover, Early Science introduced a new time scale dictating the software delivery schedule with a number of additional (concrete) phases (proposal preparation and submission, proposal review submission, project generation and observations) in the operational cycle, all of which required different portions of the delivered software at different times and even overlapping between different cycles.

An incremental roll out of software releases was adopted in 2011 and two new roles were established: release manager (from the delivering side) and an acceptance manager (from the receiving side). This key note will describe in detail the ALMA delivery process currently in use and will provide the lessons learned in the process of adopting it.

**Speaker Biography**



He studied physics at the University of Chile and works at the European Southern Observatory (ESO) since 1997, where he has held technical and management positions related to software engineering. The last 10 years he has worked for the Atacama Large Millimeter / sub-millimeter Array (ALMA), initially as part of the European team during the construction period and since 2008 in the development of ALMA operations holding various management positions in the Joint ALMA Observatory. Since March 2010, he serves as the HEad of the ALMA Department of Computing, and from January 2013 and leads the Integrated Computing Team, a worldwide collaboration, who are responsible for maintaining and perfecting the ALMA software infrastructure and services in operations.