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Keynote Speech

Model-based Software Development: Benefits and Barriers

Constance L. Heitmeyer
Head, Software Engineering
U.S. Naval Research Laboratory

In recent years, the use of models in the development of complex software systems has been steadily increasingly. Advocates of model-based software development argue that 1) the use of models can reduce the time, cost, and effort needed to build complex software systems which satisfy their requirements and 2) model-based approaches may be effective not only in development but throughout the lifetime of a complex software system. The problem addressed by software modeling researchers is therefore evolving to encompass not only development by the complete lifecycle of complex software systems. This talk will address many issues in model-based software development, including: What is the current and future role of models in software system development? What benefits can we obtain from the use of models not only in development but throughout the software life-cycle? What are the barriers to using models in software system development and evolution? What are the major challenges for software modeling researchers during the next ten years?

About the speaker

Constance Heitmeyer heads the Software Engineering Section of the Center for High Assurance Computer Systems at the Naval Research Laboratory. Her research focuses on the formal modeling and analysis of complex software systems. She has published more than 140 technical papers covering a wide range of software-related research topics, including model-based requirements specification and validation, verification using model checking and theorem proving, invariant generation, model-based test generation, security modeling, and real-time computing. A frequent invited speaker on software topics, Ms. Heitmeyer is the chief designer of NRL's Requirements Toolset, a set of tools for modeling, validating, and verifying complex software systems, which has been transferred to over 200 industry, government, and university groups. One of Ms.

Heitmeyer's major objectives is to transition the results of her research to software practice. Recently, she led a team which produced model-based evidence demonstrating the security of software implementing an embedded software device; the evidence (formal security model, proofs, demonstration of code-to-model correspondence) was used in a Common Criteria evaluation supporting U.S. government certification of the device.