New Uses of Simulation in Distributed Software Engineering

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ABSTRACT

Simulation has been used widely by software engineers to study the functionality and performance of complex distributed system designs. For example, they are used to understand network protocols, tune distributed systems, and improve distributed algorithms. They are appealing to engineers because of their inherent efficiency and scalability. Unlike many other development artifacts, simulations seem to be used, and therefore well maintained, throughout the development process, both as early design tools and as late evaluation tools. Given the effort invested in the construction and maintenance of simulations, and the degree to which developers trust in them, we wonder whether there are other purposes to which they can be put. In this lecture we present two such uses, one to increase the power of large-scale distributed experimentation and the other to develop a rigorous testing method for distributed systems.

SHORT BIOGRAPHY

Alexander L. Wolf is a professor in the Department of Computing at Imperial College London. He received his Ph.D. from the Department of Computer Science at the University of Massachusetts at Amherst. Prof. Wolf was a Member of the Technical Staff at AT&T Bell Laboratories in Murray Hill, New Jersey, and then on the faculty of the University of Colorado, Boulder, where he held the C.V. Schelke Chair in the College of Engineering. Before moving to London he helped found the Faculty of Informatics at the University of Lugano, the first such faculty in the Italian-speaking region of Switzerland.

Prof. Wolf's research interests are directed toward the discovery of principles and development of technologies to support the engineering of large, complex software systems. He has published in the areas of software engineering, distributed systems, networking, security, and database management. He is best known for his seminal work in software architecture, distributed publish/subscribe services, and content-based networking.

Prof. Wolf currently serves as Secretary-Treasurer of the Association for Computing Machinery (ACM) and as a member of the ACM Europe Council. Prof. Wolf also serves on the editorial board of the Research Highlights section of Communications of the ACM. Prof. Wolf is a Fellow of the ACM, a Fellow of the IEEE, a Chartered Fellow of the British Computer Society, holder of a Royal Society-Wolfson Research Merit Award, and a two-time recipient of the ACM SIGSOFT Research Impact Award. He received the Outstanding Achievement in Research Alumni Award from the University of Massachusetts at Amherst Department of Computer Science.