
SCS Keynote Speaker

**TITLE:**

Dynamic Speed Scaling: Theory, Practice, and the Role of Simulation

AUTHOR:

Carey Williamson, University of Calgary

ABSTRACT:

This talk provides multiple different perspectives on dynamic CPU speed scaling systems. Such systems have the ability to auto-scale their service capacity based on demand, which introduces many interesting tradeoffs between response time, fairness, and energy efficiency.

The talk begins by highlighting key results and observations from prior speed scaling research, which straddles both the theory and systems literature. A recurring theme in the talk is the dichotomy between the assumptions, approaches, and results in these two different research communities, and the role that simulation can play in bridging between them. The main part of the talk shares several insights from our own work on speed scaling designs, including coupled and decoupled speed-scaling systems. This work includes analytical and simulation modeling, as well as empirical system measurements on a modern Intel i7 processor, which we have used for calibration and validation of our speed scaling simulator. These models are then used to study auto-scaling effects in speed scaling systems, using discrete-event simulation.

SHORT BIO:

Carey Williamson is a Professor in the Department of Computer Science at the University of Calgary. His educational background includes a BSc Honors degree in Computer Science from the University of Saskatchewan in 1985, and a PhD in Computer Science from Stanford University in 1991. Dr. Williamson's research interests include Internet protocols, wireless networks, network traffic measurement, workload characterization, network simulation, and Web server performance. He is a member of ACM, SIGMETRICS, and IFIP Working Group 7.3. He served as SIG Chair for ACM SIGMETRICS from 2007-2011, and as conference chair for ACM SIGMETRICS 2005, WWW 2007, and ACM IMC 2014. He is also a founding co-Editor-in-Chief of the new ACM Transactions on Modeling and Performance Evaluation of Computing Systems.