

Distinguished Speaker Series

Friday, January 20 at 2:30pm, NTDP F285

Verifying Infrastructure for Trust

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Abstract

What is trust and how do we establish trust in systems? When greeting a friend, we establish trust by identifying them and observing their behavior. If their appearance and behavior are normal, we trust our knowledge of them and continue our interactions. If not, we do not trust them and either discontinue the interaction or continue under the assumption that something is wrong. Establishing trust in remote systems is similar. We say a remote system is trusted if it can be identified and its behavior characterized as normal. An infrastructure for establishing trust requires associating identity and behavior with a platform and appraising that behavior. The critical nature of such an infrastructure warrants formal verification at the system-level. Such verification presents numerous challenges and opportunities. This talk overviews efforts to verify infrastructure for trust focusing on the Trusted Platform Module and attestation protocol execution examining use of a state monad and dependent session types as modeling tools.

Bio

Dr. Perry Alexander is the AT&T Foundation Distinguished Professor of Electrical Engineering and Computer Science and Director of the Information and Telecommunication Technology Center at The University of Kansas. His research interests include formal methods, system-level modeling, design languages, heterogeneous specification, language semantics, and trusted computing. He received the BSEE and BSCS in 1986, the MSEE in 1988, and the PhD in 1992 all from The University of Kansas. From September 1992 through July 1999 he was a faculty member and Director of The Knowledge-Based Software Engineering Laboratory in the Electrical and Computer Engineering and Computer Science department at The University of Cincinnati. Dr. Alexander has been involved in numerous projects funded by DARPA, AFRL, NSF, NASA, Battelle, and The Department of Defense. He currently leads the DARPA TEEE, ArmoredSoftware, and Trusted SoC efforts at ITTC. He is the chief architect of the Rosetta system specification language and is author of System-Level Design using Rosetta. Dr. Alexander has published over 120 refereed research papers. He has won 22 teaching awards and was named a Kemper Teaching Fellow and the ASEE's Midwest Region Teacher of the Year in 2003, received the Sharp Teaching Professorship in 2009, and was named a Fellow of the University Honors Program in 2014. Dr. Alexander is a member of Sigma Xi and a Senior Member of ACM and IEEE.