Abstract:
Declarative networking is a programming methodology that enables developers to concisely specify network protocols and services, and directly compile these specifications into a dataflow framework for execution. This talk describes recent advances in declarative networking, tracing its evolution from a rapid prototyping framework towards a platform that serves as an important bridge connecting formal theories for reasoning about protocol correctness and actual implementations. In particular, the talk discusses the role of declarative networking in addressing two challenges in the distributed systems development cycle: the generation of safe routing implementations by unifying declarative networking with routing algebra, and network forensics through distributed time-aware provenance.

Bio:
Boon Thau Loo is an Assistant Professor in the Computer and Information Science department at the University of Pennsylvania. He received his Ph.D. degree in Computer Science from the University of California at Berkeley in 2006. Prior to his Ph.D., he received his M.S. degree from Stanford University in 2000, and his B.S. degree with highest honors from UC Berkeley in 1999. His research focuses on distributed data management systems, Internet-scale query processing, and the application of data-centric techniques and formal methods to the design, analysis and implementation of networked systems. He was awarded the 2006 David J. Sakrison Memorial Prize for the most outstanding dissertation research in the Department of EECS at UC Berkeley, and the 2007 ACM SIGMOD Dissertation Award. He is a recipient of the NSF CAREER award (2009) and the Air Force Office of Scientific Research (AFOSR) Young Investigator Award (2012). He has served as the program co-chair for the CoNEXT 2008 Student Workshop, the NetDB 2009 workshop co-located with SOSP, and the Workshop on Rigorous Protocol Engineering (WRIPE 2011) co-located with ICNP.