

ROBERT K CUNNINGHAM

Carnegie Mellon University's Software Engineering Institute

Dr. Robert K. Cunningham is the Chief of the Laboratory for Physical Sciences. His home institution is CMU, where he is the Assoc. Director of Cyber Assurance in the CERT Division at the Software Engineering Institute and is an Adjunct professor of Cybersecurity at the Institute for Software Research in the School of Computer Science.

Dr. Cunningham has worked in industry. He started his career at Raytheon, designing and developing a parallel and distributed operating system for the next-generation weather radar system. After completing his master's degree, he became a staff member in the Machine Intelligence Group at Lincoln Laboratory, where his research focused on machine learning, digital image processing, and image and video understanding. As part of these efforts, he contributed to early drafts of the real-time message passing interface (MPI/RT) specification. He transferred to the Information Systems Technology Group, where he pursued system security research and development. Initially, he focused on intrusion detection systems that do not require advance knowledge of the method of attack, then broadened his research to consider detection and analysis of malicious software. He has published and built systems that protect those systems and data against remote and local attackers, focusing initially on embedded systems and subsequently on cloud systems, using techniques of system security and cryptography.

Throughout his time working on cyber security, he has been interested in evaluating the performance of security systems. Dr. Cunningham has patented security-related technology, presented and published widely, chaired the IEEE Cybersecurity Initiative, and served as founder and general chair for IEEE Cybersecurity Development (SecDev) Conference, general chair for the International Symposium on Recent Advances in Intrusion Detection (RAID) and the IEEE Symposium on Security and Privacy (IEEE S&P), and as chair or on program committees for RAID, WORM, IEEE International Symposium on Technologies for homeland Security, and IEEE S&P, among others.

Dr. Cunningham has also served on several national panels and led many national teams. In 2001, Dr. Cunningham led the research working group for the National Security Agency's computer network defense research and technology transition program manager, receiving a commendation for his work from the director. In 2002, he participated in a study for the Defense Advanced Research Projects Agency (DARPA), developing a research program to detect and quarantine computer worms. In 2004, he was elected to the executive committee of the Institute for Information Protection (I3P), and later that year he was appointed to the executive advisory board for the Advanced Research and Development Activity (ARDA—now IARPA) organization. From 2005 through 2009, Dr. Cunningham managed a large, multi-institution research effort to secure process control systems for the I3P and the Department of Homeland Security. In 2011 and 2012, he served as the Lincoln Laboratory representative to the U.S. Department of Defense's Priority Steering Council on Cyber Security Research and Development. In 2013, he served on the U.S. Army Cyber Materiel Development Strategy Review Panel. In 2015, he was named chair of the IEEE Cybersecurity Initiative. Dr. Cunningham is a Fellow of the IEEE and a member of Sigma Xi and the ACM.

Dr. Cunningham received an ScB degree in computer engineering from Brown University, an MS degree in electrical engineering from Boston University, and a PhD degree in cognitive and neural systems from Boston University. Since then, he has taken classes in cryptography and leadership from MIT and Harvard Kennedy School, respectively.