

Neil Siegel

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The IBM Professor of Engineering Management Daniel Epstein Department of Industrial and Systems Engineering Viterbi School of Engineering, University of Southern California



Neil Siegel is the IBM Professor of Engineering Management in the Epstein Department of Industrial and Systems Engineering, and is also a professor of Computer Science practice, both within the Viterbi School of Engineering at the University of Southern California. He is a recognized expert in the design and development of large, complex systems that serve important societal needs, both as a practitioner at the largest scales, and as a researcher.

Until his retirement at the end of 2015, he held the position of sector vice-president and chief technology officer at Northrop Grumman, successively for their Mission Systems and Information Systems sectors. He led the sector's research portfolio (\$600M / year), and

oversaw the development of technical solutions for their customers' most-important problems. He also oversaw the sector's 12,000-plus scientists and engineers, directed engineering process improvements, and activities to develop the company's technical talent.

Previously, Dr. Siegel served as vice-president and general manager of the company's Tactical Systems division, and a director of the company's U.K. subsidiary. He has been responsible for engineering projects in many parts of the world, including the United States, the U.K., NATO, Saudi Arabia, and other countries. In all, he served as a vice-president of the company for nearly 18 years.

Dr. Siegel led the engineering on a large number of successful fielded military and intelligence systems, including the U.S. Blue-Force Tracker; the U.S. Army's first unmanned aerial vehicle; several air-defense and missile-defense systems (including the Forward-Area Air Defense system); the fire-control segment of the world's first complete laser weapon system; and played important roles for many other systems for ground, sea, space, and cyber-space. These systems have repeatedly been cited as model programs and important national capabilities, and won many awards from customers, including the inaugural Crosstalk Award for the best-managed software program in the entire U.S. Government.

In addition to his contributions to national security through his work for the U.S. defense department and the U.S. intelligence community, Siegel's work has led to significant advances in consumer electronics, healthcare, the steel industry, the movie industry, and the electric power industry. Most drug prescriptions in the U.S. are now checked so as to reduce unintended adverse interactions between drugs prescribed by different doctors through systems of a type that Siegel helped pioneer, saving thousands of lives each year. Almost every movie screen in the country uses a secure digital distribution system for which Siegel is a cited co-inventor. He helped to identify new types of causes for large-scale electrical power outages, and developed approaches for facilitating recovery from these events that are now being prototyped by major utility companies.

Techniques for which he is the patent-holder of record are used in a very large number of mobile consumer electronics devices around the world (including almost every GPS receiver, smart phone, and tablet computer in existence). The team he led created the first complete, fielded, wireless internet that performed routing and network management in the presence of the relatively rapid changes in configuration and data-paths inherent in wireless, mobile operation. His team also created the now-universal techniques for automation orientation of a mobile device's map display, and for managing security when mobile devices are lost or stolen.

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He is a recognized expert in information networking, especially network management, wireless networks, networks of mobile devices, and network science, focusing on the special needs of communications protocols and network management for wireless, mobile networks.

He holds nearly 50 issued and pending patents worldwide.

Much of his recent research has made contributions in the field of improving development methodology for large-scale systems, through the identification of novel root-causes of system-development failures, new methods to correct those root-causes, and application of those new techniques to problem domains such as health, energy, and Government information systems.

Dr. Siegel has received numerous awards and honors, including:

- Election to the U.S. National Academy of Engineering
- Selection as a fellow of the U.S. National Academy of Inventors
- Selection as a fellow of the Institute of Electrical and Electronics Engineers (IEEE)
- Selection as a fellow of the International Congress on Systems Engineering (INCOSE)
- Selection as a Fellow of the Asia-Pacific Artificial Intelligence Association (AIAA)
- The IEEE Simon Ramo Medal for systems engineering and systems science
- The TRW Chairman's Award for Innovation (three times)
- The Army's Order of Saint Barbara
- The iCMG award for system architecture
- The Northern Virginia Technology Council CTO-of-the-year award
- The Albert Nelson Marquis Lifetime Achievement Award
- The Crosstalk Award for the best-managed software project across the entire U.S. Government

Dr. Siegel is also the author of recent textbooks on *Engineering Project Management*, *The Economics of Engineering Management*, and *Principles of Systems Engineering*.

Other recent publications include a chapter in a book on ethics in engineering, and articles in various technical journals.

Public service includes current board positions for three charitable organizations, 10 years as an elected public official (California Hazard Abatement District board), former membership on the Defense Science Board, the Army Science Board, and the board of the research foundation of the State University of New York, among many other public activities.

Neil has been a musician since he was a child, and has done more than 1,500 performances in many parts of the world. He is a long-time member of Professional Musicians Local 47, American Federation of Musicians, AFL-CIO.

Education:

- Ph.D., Industrial and Systems Engineering, USC
- Masters of Science, Mathematics, USC
- Bachelors of Arts, Mathematics, USC