

# The Coming Era of Cyber-Physical Systems

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**Abstract:**

There is an increasing demand for better transportation, energy, healthcare, water systems, etc., by societies across the planet. There is also increasing awareness that we need to redesign several systems to take into account planetary limitations. In attempting to confront several such diverse challenges, the twenty-first century could well become the age of building large-scale systems that feature tight integration of computing, communication, and control technologies. We present a historical perspective of several paths leading to the present interest in this field of cyberphysical systems, as well as an account of several research challenges, including those relating to communication and networking, that are important for the further development of this field. These include in-network information processing, real-time networking, networked control, hybrid systems, security, and middleware.

**Speaker Bio:**

**P. R. Kumar** obtained his B. Tech. degree in Electrical Engineering (Electronics) from I.I.T. Madras in 1973, and the M.S. and D.Sc. degrees in Systems Science and Mathematics from Washington University, St. Louis, in 1975 and 1977, respectively. From 1977-84 he was a faculty member in the Department of Mathematics at the University of Maryland Baltimore County. From 1985 to 2011, he was a faculty member in the Department of Electrical and Computer Engineering, and the Coordinated Science Laboratory at the University of Illinois. Currently, he is in the Computer Engineering and Systems Group of the Department of Electrical and Computer Engineering at Texas A&M University. He has worked on problems in game theory, adaptive control, stochastic systems, simulated annealing, neural networks, machine learning, queueing networks, manufacturing systems, scheduling, wafer fabrication plants, wireless networks, and information theory. His research is currently focused on wireless networks, sensor networks, and

cyberphysical systems.

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