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The evolution of system theory: birth, flaming youth, sober middle age, future prospects

Abstract

System theory in a narrow sense – treatment of (linear) networks by mathematics, complex rational functions – was created in 1924 by R. M. Foster and development continued until the 1950's when the initial ideas ran into mathematical difficulties of such depth that electrical engineers were unable to progress, forcing a reorientation of the mathematics toward linear algebra, still dominant after 50 years. This story is a chapter in the Newtonian Revolution: After understanding the basic phenomena, treat physical systems problems via mathematics. What you didn't understand by physical logic may be a mathematical problem of great depth and difficulty.

About the Speaker

Prof. Kalman ist the inventor of the famous Kalman filter, which is one of the most influential breakthroughs in system science, and father of the modern state space approach to systems and control theory.

Educated at MIT and Colombia (Ph.D. in 1957), Kalman was with the Research Institute for Advanced Study 1958-1964, Stanford University 1964-1971, and University of Florida 1971-1992. Since 1973 he has also held the chair for Mathematical System Theory at the ETH. He is the recipient of numerous awards, including the IEEE Medal of Honor (1974), the IEEE Centennial Medal (1984), the Kyoto Prize in High Technology (1985), the Steele Prize of American Mathematical Society (1987), and the Bellman Prize (1997), to name just a few. He is a member of the National Academy of Sciences, the National Academy of Engineering, and the American Academy of Arts and Sciences. He is a foreign member of the Hungarian, French and Russian Academies of Science and has received many honorary doctorates.

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Further information:

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