10Th Khwarizmi International Award

Feb 1997

Researcher: Kanti Bhushan Datta

Research Title: Mathematical Control Theory

Rank: Second

Field: Electronic and Computer

Country: India

The project is described in these sections:
- The analysis and synthesis of a linear control system necessitate a validated model of the same. A stipulated model of dynamical systems can be identified from the input – output data. An orthogonal transformation based method for identification in continuous as also discrete- time domain of a linear dynamical system is introduced in.
- An elaborate theory of continuous- time system identification via orthogonal polynomials and sine-cosine functions is developed in a series of papers using integral operational matrix. It is shown that by employing "one shot operational matrix of repeated integrations' numerical properties of estimation can be improved. Distributed parameter systems are also included.
- Coprime matrix fraction description (MFD) via Sylvester's resultant
- Canonical forms via orthogonal transformation
- Eigenvalue assignment: stable and parallel algorithm
- State-space realization via orthogonal transformations
- Orthogonal structure theorem
- State-variable feedback decoupling via orthogonal structure theorem
- Solution of matrix Riccati equation
- Two- time scale systems

Kanti Bhushan Datta was born on August 13, 1939 in Balijan, Assam India. He obtained his B.Sc. in physics, M.Tech., Ph.D. in applied physics in 1960, 1963, 1972 respectively, from Calcutta University. In 1982 he joined the electrical engineering department of IIT, kharagpur as a pool officer and became an assistant professor there in 1984 and a professor in 1985.

Prof. Datta is a fellow of IETE and IE (India), a senior member of IEEE (NY) and a member of the systems society on India.

He authored two books: "*matrix and linear algebra*" prentice hall of India, 1991 and "*orthogonal functions in systems and control*", world scientific, 1995, Singapore.