FIU

Electrical & Computer Engineering

FLORIDA INTERNATIONAL UNIVERSITY

Invited Speaker Series

Dr. Venkataramanan Balakrishnan

Purdue University - Department of Electrical and Computer Engineering

Hierarchically Semiseparable (HSS) matrices and their application in engineering

Friday, September 29 | 10 am - 12 pm

Florida International University | Engineering Center 3930

Abstract

Structured matrices have long been studied not only for their elegant properties but also for the implications of matrix structure on large-scale matrix computation. There has been a large body of recent work on a class of rank-structured matrices called Hierarchically Semiseparable (HSS) matrices. An HSS matrix, while being dense in general, has a block structure with dense diagonal blocks with the off-diagonal blocks having a specific low-rank structure. Such matrices arise frequently in several engineering applications. In this talk, we will present an introduction to HSS matrices, numerical algorithms for HSS matrices, and describe their application in a few engineering problems.

Bio

Ralph Venkataramanan Balakrishnan received the B.Tech. degree in electronics and communication from the Indian Institute of Technology, Madras, India, in 1985, and the M.S. degree in statistics and Ph.D. degree in electrical engineering from Stanford University, Stanford, CA, in 1992. Since 1994, he has been a faculty member with the School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN, where he is currently Professor and Michael and Katherine Birck Head. His primary research interests are the application of numerical techniques, especially those based on convex optimization, to problems in engineering. He is a coauthor of the monograph Linear Matrix Inequalities in System and Control Theory (SIAM, 1994). Dr. Balakrishnan was the recipient of the 1985 President of India Gold Medal presented by the Indian Institute of Technology (Madras), the 1997 Young Investigator Award presented by the Office of Naval Research, the 1998 Ruth and Joel Spira Outstanding Teacher Award, and the 2001 Honeywell Award for Excellence in Teaching presented by the School of Electrical and Computer Engineering, Purdue University. He was named a Purdue University Faculty Scholar in 2008. Dr. Balakrishnan is a Fellow of the IEEE.