COLLOQUIUM ANNOUNCEMENT

Fast Transforms: Banded Matrices with Banded Inverses

Professor Gilbert Strang
Professor of Mathematics,
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Date:  20 January 2010 (Wednesday)
Time:  10.30 am – 11.30 am
Venue:  SPMS-Lecture Theatre 2, SPMS-03-03
School of Physical and Mathematical Sciences

Good transforms give useful decorrelation of the data - but they must be fast too! The success of the wavelet transform depends on the property that its inverse also involves finite length filters. ***So the transform and its inverse are both represented by banded matrices***. We provide a factorization for these matrices and many extensions - including time-varying filters and also recurrences that arise in the theory of orthogonal polynomials.

Speaker Biography

Gilbert Strang was an undergraduate at MIT and a Rhodes Scholar at Balliol College, Oxford. His Ph.D. was from UCLA and since then he has taught at MIT. He has been a Sloan Fellow and a Fairchild Scholar and is a Fellow of the American Academy of Arts and Sciences. He is a Professor of Mathematics at MIT and an Honorary Fellow of Balliol College. Professor Strang has published eight textbooks: Introduction to Linear Algebra (1993,1998,2003,2009); Linear Algebra and Its Applications (1976,1980,1988,2005); An Analysis of the Finite Element Method, with George Fix (1973, 2008); Introduction to Applied Mathematics (1986); Calculus (1991); Wavelets and Filter Banks, with Truong Nguyen (1996); Linear Algebra, Geodesy, and GPS, with Kai Borre (1997) and Computational Science and Engineering (2007). He was the President of SIAM during 1999 and 2000, and Chair of the Joint Policy Board for Mathematics. He received the von Neumann Medal of the US Association for Computational Mechanics, and the Henrici Prize for applied analysis. The first Su Buchin Prize from the International Congress of Industrial and Applied Mathematics, and the Haimo Prize from the Mathematical Association of America, were awarded for his contributions to teaching around the world. His home page is math.mit.edu/~gs/ and his video lectures on linear algebra and on computational science and engineering are on ocw.mit.edu (mathematics/18.06 and 18.085).

Host: Division of Mathematical Sciences, School of Physical and Mathematical Sciences

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