

Sparse Kernel Representations

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Abstract

In computer and information science one seeks for efficient representations of signals. While the basis type, or in other words those associated with transformations such as the Fourier and wavelet, is classical and standard, the non-basis type is a novel idea and generates sparse representations with fast convergence. In the lecture we will give an account on the latest and new developments of the sparse and stochastic sparse representations in reproducing kernel Hilbert spaces, and more generally in Hilbert spaces with a dictionary.

Biography

Tao Qian, graduated from Peking University in 1984 with Doctor degree. 1984-1986 postdoctoral work in Institute of mathematics, Chinese Academy of Sciences. From 1986 to 1992, he worked as postdoctoral fellow at Macquarie University and Flinders University. 1992-2000 lecturer at the University of New England, Australia. From 2000 to now, he worked as Associate Professor, Professor, Distinguished Professor and Chair of Department of Mathematics at the University of Macau. From 2019 to now, he has been Professor of Macau University of Science and Technology and director of Macau Center for Mathematical Sciences. Research interests include harmonic analysis, signal analysis, complex analysis of single and several complex variables, quaternionic and Clifford analysis. In recent years, his main research interests include mono-component function theory and adaptive Fourier decomposition. Based on his study on "adaptive positive frequency decomposition and algorithm implementation of transient signals" he won the first prize of Macau Natural Science in 2012. His research results have found ample applications in signal and image analysis and system identification. So far, he has published more than 200 papers in international mathematical and computer science journals and three monograph books, and served as the editorial board of SCI mathematical journals MMAS, CAOT and CVEE.