Prof. Bhaskar Rao has been a faculty member at the University of California, San Diego (UCSD) since 1983. He was the Director of the UCSD center for wireless communications (2008-2011) and holds the Ericsson Endowed Chair in Wireless Network Access. During the last 35 years, he has been an active member of the signal processing community and distinguished himself through sustained research excellence and many seminal contributions. His papers are well known for the highest originality, depth, and clarity, and are highly recognized: 2012 SPS society best paper award, 2008 Stephen O. Rice Prize Paper Award in the Field of Communication Systems, Best student paper award (David Wipf) at NIPS 2006, Student paper awards (Haichang Sui, Jun Zheng) at ICASSP 2005 and 2006, an SPS Distinguished Lecturer (2014-2015), to mention a few. His work has resulted in over 400 publications (journal and conferences) and has spanned many areas; Adaptive filtering, High Resolution Spectral estimation, Array processing, VQ with applications to speech, speech modeling, MIMO communications and signal processing theory and algorithms that exploit sparsity. Due to space limitations, only his early and latest works are discussed. His early work in spectral estimation and array processing has resulted in a number of significant contributions and is by now highly recognized and led to his elevation to IEEE Fellow in 2000. The following are two representative publications:


His more recent work (past 22 years) has been in the area of sparsity and its role in signal processing, an area in which Prof. Rao has played a leadership role. He was one of the true pioneers, with his first work published in 1992, to recognize that the concept of sparsity is fundamental and that the underlying mathematical principles are important to the signal processing community. He has made many fundamental contributions to all aspects of this subject: theory, algorithms and applications. A sampling of his publications is provided below.

The following two papers pioneered early and seminal work in the development of novel measures and algorithms for sparse modeling, such as FOCUSS. FOCUSS is a landmark paper, that established convergence results for sparse modeling, as early as 1997, using concepts which later on were understood as the spark of a matrix:


The following work represents a significant generalization of the sparsity framework. It extends the framework to deal with multiple measurements vectors greatly enhancing the application domain.


These papers represent seminal contribution to algorithmic work. They develop an algorithm for sparse signal recovery based on sparse Bayesian learning which is considered one of the leading algorithms today:


This work represents a significant advancement to the understanding of the limits of sparse signal recovery and provides the best known bounds on this topic: