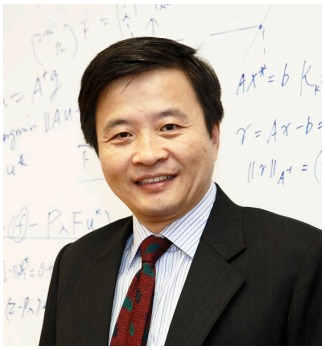
Professor SHEN Zuowei
Tan Chin Tuan Centennial Professor
With effect from January 2013

Vice Provost (Graduate Education)
National University of Singapore

Dean, Faculty of Science
National University of Singapore



Professor Shen received his B.S. degree in Mathematics from Hohai University, Nanjing, China, in 1982 and his Ph.D. degree in Mathematics from the Department of Mathematics of the University of Alberta, Edmonton, Canada, in 1991. He then spent two years at the University of Wisconsin-Madison, USA as a Research Associate.

Since 1993, he has been with the Department of Mathematics, National University of Singapore. Prof Shen has received numerous awards and honours, including the NUS Outstanding University Researcher Award (2008 and 1997), Wavelet Pioneer Award from the Society of Photographic Instrumentation Engineers, US (2012), and the National Science Award of Singapore (1998). He has been elected as Fellow of the World Academy of Sciences (2020), Fellow of the Society for Industrial and Applied Mathematics, US (2019), Fellow of the American Mathematical Society, US (2017), and inaugural Fellow of the Singapore National Academy of Science (2011).

He has been invited to speak at many international conferences and workshops, including the International Congress of Mathematicians in 2010 and International Congress on Industrial and Applied Mathematics 2015. He is on the editorial boards of several international journals in applied mathematics.

Research

Interests: Approximation theory, wavelet theory and applications, mathematical Imaging

A renowned mathematician, Professor Shen is well-known for his fundamental contributions in mathematical foundations of data science, especially in the areas of approximation and wavelet theory, image processing and compressed sensing, computer vision and machine learning.

Together with his collaborators, he has made several significant contributions in wavelet theory and its applications that include:

- The development of a theoretical framework and construction of multivariate wavelets, which can be used for geometric compression and reconstruction;

- The introduction of two mathematical principles: the duality principle for Gabor frames, and the unitary extension principle for wavelet frames, which provide a foundation for Gabor frames and wavelet frames;

- Pioneering the use of wavelet frames in digital image restorations. He has built up models based on wavelet frame theory, derived powerful algorithms and provided their mathematical analysis. With his work, the wavelet-frame-based image recovery has become one of the main approaches in the field. In addition, his algorithms have also been used in other applications such as restoration of video images, reconstruction of biomedical images, compress sensing and low-rank matrix complication.