

## **Research Highlights of Prof. P.C. Ching**

The widespread access of mobile phone and the huge penetration of digital multimedia in the past decade have created an unprecedented demand on high-speed high-capacity wireless communications. This revolution in wireless communications is enabled by the advent of sophisticated digital signal processing techniques, and constant technological breakthroughs in wireless networks. The key driving technologies that facilitate extremely high data rates delivery include the adoption of spectrum sharing schemes and multiple-input multiple-output (MIMO) connectivity.

Professor Ching, together with his research team, have recently proposed spectrum sharing schemes for large-scale and random geometric wireless networks with an aim of improving network throughput and managing intra-network and inter-network interference caused by the stochastic nature of channel propagation and node distribution. They have also proposed distributed space-time coding for MIMO systems to achieve full spatial diversity with low decoding complexity in both synchronized and asynchronous scenarios. Many of their research findings have been published in top-tier international journals and flagship international conference proceedings. With the support of a research grant granted by the HKSAR Research Grant Council, they are now carrying out an in-depth study on interference alignment and spatial diversity of MIMO wireless networks. The ultimate goal of this project is to devise a comprehensive signal processing approach that deals with undesired interference within the same cellular wireless communication cell.

Professor Ching founded the Digital Signal Processing and Speech Technology Laboratory (DSP-STL) in the Department of Electronic Engineering of the Chinese University of Hong Kong (CUHK) some twenty-five years ago. DSP-STL focuses on developing frontier and cutting-edge technologies and its research endeavors and achievements in adaptive signal processing, communication systems, speaker identification and Chinese language processing are widely recognized. Prof. Ching has established close collaboration with many renowned scholars in the USA, Canada, Australia and China. He has also supervised over fifty graduate students and postdoctoral fellows, of which three of his PhD students are now IEEE Fellows. Professor Ching is presently Senior Adviser to the President of CUHK, Choh-Ming Li, Professor of Electronic Engineering, and Director of the Shun Hing Institute of Advanced Engineering. He was Pro-Vice-Chancellor/Vice-President of CUHK from 2006 till 2014, and Dean of Engineering between 1998 and 2003. He was awarded the Silver Bauhinia Star (SBS) and the Bronze Bauhinia Star (BBS) by the HKSAR Government in 2017 and 2010, respectively, in recognition of his long and distinguished public and community services.

