

KEYNOTE SPEAKERS



Wan-Chi Siu

Department of Electronic & Information Engineering /
 Dean of Engineering Faculty
 The Hong Kong Polytechnic University, Hong Kong

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Deep Learning Latent Space for Super-Resolution with Extension to other Signal Processing Applications

In this presentation, we start with an elaboration of the mechanism of some deep learning techniques and the reasons of their success, which include attention mechanics and back projection structures for image super-resolution and enlightening, etc. A comparison of these techniques with conventional signal processing approaches will be given. We then gradually highlight the development of Generative Adversarial Network (GAN), StyleGAN, Diffusion Model, etc. to show that these represent a 2nd revolution on image to image processing and image manipulation problems, making use of the huge latent space, which resolves these problems with an initial prior or even turns these problems into a searching or retrieval exercise in the latent space. At the end of the presentation, fruitful demonstrations will be provided.

BIOGRAPHY

Prof. Wan-Chi Siu, PhD, DIC, Life-FIEEE, is Emeritus Professor (formerly Chair Professor, HoD (EIE) and Dean of Engineering Faculty) of Hong Kong Polytechnic University and Research Professor of Caritas Institute of Higher Education in Hong Kong. He is Life-Fellow of IEEE and was a PhD graduate (1984) of the Imperial College London, Vice President, Chair of Conference Board and core member of Board of Governors of the IEEE SP Society (2012-2014), and President (2017-2018) of APSIPA, and has been Guest Editor/Subject Editor/AE for IEEE Transactions on CAS, IP & CSVT, and Electronics Letters. He is an outstanding scholar with many awards, including Distinguished Presenter Award, the Best Teacher Award, the Best Faculty Researcher Award (twice) and IEEE Third Millennium Medal (2000). He was an APSIPA Distinguished Lecturer (2021-22), and an Advisor & Distinguished Scientist of the European research project SmartEN (offered by European Commissions). Prof. Siu has been Keynote Speaker and Invited Speaker of many conferences, published over 500 research papers (200 appeared in international journals such as IEEE Transactions on Image Processing) in DSP, transforms, fast algorithms, machine learning, deep learning, super-resolution imaging, 2D/3D video coding, object recognition and tracking, and organized IEEE society-sponsored flagship conferences as TPC Chair (ISCAS1997) and General Chair (ICASSP2003 and ICIP2010). He was an independent non-executive director (2000-2015) of a publicly-listed video surveillance company and chaired the First Engineering/IT Panel of the RAE (1992/93) in Hong Kong. Recently, he has been a member of the IEEE Educational Activities Board, the IEEE FourierAward for Signal Processing Committee (2017-2020), the Hong Kong RGC Engineering-JRS Panel (2020-2023), Hong Kong ASTRI Tech Review Panel (2006-2022) and some other IEEE technical committees.