



APSIPA

ASIA PACIFIC SIGNAL AND INFORMATION PROCESSING ASSOCIATION

Taiwan Local Chapter

Video Enhancement for Challenging Environments

Date: August 11 (Monday), 2025

Time: 01:30 pm - 02:30 pm Taiwan (UTC +8)

Location: EC329 (Room 329, Engineering Building #3, NYCU)

Speaker: Dr. Nantheera (Pui) Anantrasirichai, University of Bristol, UK

Abstract: Videos captured under real-world conditions often suffer from various degradations, including poor illumination, motion blur, defocus, noise, low contrast, flicker, and temporal inconsistencies. These issues not only degrade visual quality but also hinder downstream tasks such as object tracking, recognition, and segmentation. As a result, video quality enhancement has become a critical research focus—especially for footage captured in uncontrolled or adverse environments. Recent advances in AI have significantly improved ‘image’ enhancement, with tools now widely available in both free and commercial software. In contrast, ‘video’ enhancement using AI is still in its early stages, due to challenges such as uncertain input characteristics, limited datasets, high computational complexity, and large memory demands. A common workaround is to apply image-based enhancement frame-by-frame; however, this often leads to temporal inconsistencies. In this talk, I will present modern deep learning-based methods for handling degradations such as low-light conditions, underwater distortions, and atmospheric turbulence. Our approach consists of two key modules: one for feature alignment across multiple input frames and another for feature enhancement. These methods leverage the capabilities of 3D deformable convolutions, transformers, and Mamba. Finally, I will discuss strategies for reducing computational complexity, with the aim of achieving real-time performance.

Speaker’s Bio:



Dr. Nantheera (Pui) Anantrasirichai received her Ph.D. from the University of Bristol, UK, in 2007 and is currently an Associate Professor in Visual Computing at the University of Bristol. She is Co-Director of the Bristol Vision Institute and a member of the Visual Information Laboratory. She also serves as Programme Director of the MSc in Immersive Technologies. Her research focuses on image processing and computer vision for challenging data, contributing to numerous internationally connected interdisciplinary projects. She has collaborated with over 30 partners from both research institutions and industry. Dr. Anantrasirichai currently serves as an Associate Editor for The Visual Computer journal and as a member of the Technical Area Committee for EURASIP Biomedical Image & Signal Analytics. She is also a Co-Investigator and Senior Scientist at the UK Centre for Observation and Modelling of Earthquakes, Volcanoes, and Tectonics.

Host: Prof. Wen-Hsiao Peng (wpeng@cs.nctu.edu.tw), National Yang Ming Chiao Tung University (NYCU), Taiwan



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Zoom Link:

Wen-Hsiao Peng is inviting you to a scheduled Zoom meeting.

Topic: APSIPA DL Talk

Time: Aug 11, 2025 01:30 PM Taipei

Join Zoom Meeting

<https://us06web.zoom.us/j/86240883368?pwd=VAuQzKTlPbpGR4AQyGJVpBdTZk4P3n.1>

Meeting ID: 862 4088 3368

Passcode: 2F8MQ2