

Revised



## SEMINAR

Department of Electronic Engineering  
The Chinese University of Hong Kong

### Warped Time Stretch: Optical Engineering at the Speed of Light

by

**Mr. Jacky Chan**

Electrical and Computer Engineering Department  
University of California, Los Angeles

**Date :** 28<sup>th</sup> February, 2018 (Wednesday)  
**Time :** ~~13:00 p.m.~~ **11:00 a.m.**  
**Place :** Rm ~~222~~ **121** Ho Sin Hang Engineering Bldg., CUHK

#### Abstract

Photonic time stretch is a well-established real-time optical technology. Using dispersion, the spectral modulation of a broadband optical pulse is stretched to alleviate the bandwidth bottleneck present in the subsequent analog-to-digital conversion and digital processing.

The recent warped time stretch generalizes this concept with tailored non-uniform dispersion profiles, reshaping the wideband optical information arbitrarily and in real-time. The approach provides a design pathway for translating *a priori* knowledge of signal spectra into context-optimized data acquisition and processing. This has wide-ranging applicability, including optical pulse reshaping, feature extraction, network coding, data compression and optical phase retrieval.

Here, we will analyze the effects of an arbitrary dispersion profile on wideband optical signals, and show how its proper design provides full-field control over critical parameters, e.g. time-bandwidth product, SNR etc. We then show the application of warped stretch to both optical and digital image compression.

#### Biography

Jacky Chan is a PhD candidate in the Jalali research group at UCLA. His recent work concerns the theory, effects and applications of tailored dispersion profiles in warped photonic time stretch. He has served in the OSA and SPIE joint student chapter as treasurer in 2015 and became the chapter president in 2016. His research interests include ultrafast optical systems, data acquisition and analytics, real-time image and signal processing, and spectroscopic sensing and imaging.

**\*\*\* All are welcome to attend \*\*\***

For inquires, please contact Prof. Chester Shu, Tel. No. 3943 8258