

# NATIONAL UNIVERSITY OF SINGAPORE

School of Computing

## C S S E M I N A R

**Title:** Exploring and Editing Scene Appearance

**Speaker:** Dr. Pierre-Yves Laffont  
ETH Zurich

**Date/Time:** 30 September 2014, Tuesday, 10:30 AM to 12:00 PM

**Venue:** MR6, AS6-05-10

**Chaired by:** Dr Low Kok Lim, Senior Lecturer, School of Computing  
(lowkl@comp.nus.edu.sg)

### Abstract:

We live in a dynamic visual world where the appearance of outdoor scenes changes dramatically from hour to hour or season to season. Specific conditions, such as the "golden hours" around sunset and sunrise, can be hard to capture in photographs because of their transient nature -- they change quickly over time. Despite recent advances in image editing software, common image manipulation tasks such as lighting editing require significant expertise to achieve plausible results.

In this talk, we first focus on extracting and manipulating the lighting in a photograph. Intrinsic image decomposition separates a photograph into independent layers: reflectance, which represents the color of the materials, and illumination, which encodes the effect of lighting at each pixel. We tackle this ill-posed problem by leveraging additional information provided by multiple photographs of the scene. The methods we describe enable advanced image manipulation such as lighting-aware editing, insertion of virtual objects, and image-based illumination transfer between photographs of a collection.

We then study appearance changes in images of outdoor scenes captured by static webcams over time. We use crowdsourcing to annotate thousands of images in the "transient attributes database", and learn to recognize properties such as season or weather in new photographs. Finally, we propose a method for high-level image editing and introduce a novel example-based technique to transfer scene appearance across images. We show that we can convincingly modify many transient attributes in a scene, for example to make it "more snowy" or "sunset".

### Biodata:

Pierre-Yves Laffont is a postdoctoral researcher at ETH Zurich and is currently visiting the BeingThere Centre at NTU in Singapore. His recent research focuses on the appearance of outdoor scenes, intrinsic image decomposition, and image-based rendering/relighting with

geometric cues from multi-view reconstruction. He did his PhD at INRIA Sophia-Antipolis with George Drettakis and Adrien Bousseau, and his postdoc at Brown University with James Hays. He spent a few months at UC Berkeley and MIT CSAIL, and also studied at INSA Lyon (France) and at KAIST (South Korea).