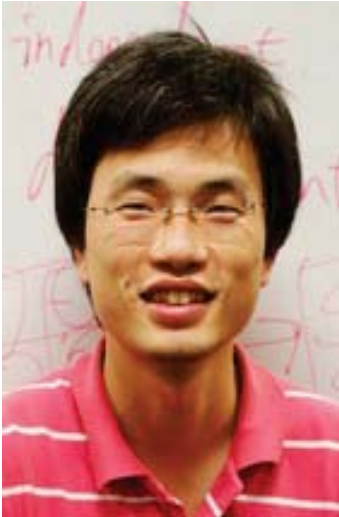# Research Seminar

Appearance Capture and Material Classification

Dr. Ping Tan | Simon Fraser University

Thu. Oct. 29th, 2015　|　12:00-1:00 PM　　|　Porter Hall B34

Seminar abstract:

The appearance of an object is determined by its 3D shape, surface bi-directional reflectance function (BRDF), lighting, and viewing conditions. Radiometric image analysis methods seek to reverse this process to recover shape, BRDF, or lighting conditions from images. Many radiometric image analysis methods employ highly nonlinear BRDF models to describe the interaction between light and surfaces. We exploit general BRDF symmetries such as isotropy and reciprocity to solve 3D shape and BRDF from images. Our method avoids complicated nonlinear optimization and at the same is applicable to broader class of materials. The recovered BRDF might be applied for material classification problems. We analyze sample distribution in the parameter space of a BRDF. We find that camera facing toward a flat material sample suffers significant degeneration in sampling, and a titled camera will significantly improve material classification performance. We analyze the optimal camera and lighting configuration for material classification and developed a handheld system for material classification.

Speaker bio:

Dr. Ping Tan obtained his PhD degree from the Hong Kong University of Science and Technology in 2007. After that, he joined the National University of Singapore as an assistant professor and was promoted to associate professor in 2014. Dr. Tan is now an assistant professor in the Simon Fraser University. Dr. Tan's research interests include computer vision, graphics, and robotics. He received the inaugural TR35@Singapore award, and the IVC outstanding young researcher honorable mention award, both in 2012. Dr. Tan serves in the editorial board of the International Journal of Computer Vision (IJCV), Machine Vision and Applications (MVA), and Unmanned Systems.

Seminar Committee:

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Seminar notes: