

CIE/USA-Seattle

Spring 2016 Technical Seminar



Dr. Yan Wang
Microsoft

“Bring Intelligence to Cameras with an Image Search Engine”

Dr. Christopher Lum
Department of Aeronautics & Astronautics, University of Washington
“Commercial and Civilian Applications of Unmanned Aerial Systems”

April 30, 2016 (Saturday) 1:00 – 3:00 PM

Bellevue Regional Library

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Agenda

- 1:00 PM Welcome and Introduction - James Lee/Ed Miao
- 1:10 PM “Bring Intelligence to Cameras with an Image Search Engine” - Dr. Yan Wang
- 2:00 PM “Commercial and Civilian Applications of Unmanned Aerial Systems” - Dr. Christopher Lum
- 2:50 PM Post Presentation Discussion & Networking - All
- 4:00 PM Adjourn

“Bring Intelligence to Cameras with an Image Search Engine”

Dr. Yan Wang

Artificial Intelligence is a dream of humans since 1960s. Despite that computers have shown tremendous capability in calculation and memorization, limited progress was made in simulating humans' intelligence, such as understanding the content of a 2D/3D image. In this talk, I will show several Computer Vision applications in which computers show intelligence to some extent, with a simple idea of searching for similar images. First, we will see a robotic system that can recognize the pose of a garment by searching for similar 3D models from a pre-captured database, so that the robot can fold the garment automatically. Second, we will take a look at how Photoshop "deblurs" a blurry photo taken in a dark environment by looking for similar image patches in a database. Third, we will turn the idea of searching similar regions between two images to an app, allowing users to capture videos with stunning bullet-time special effects, and take panoramas in highly dynamic scenes. In the end, we will check a social experiment of building an intelligent robot, which can recognize "pretty" faces, based on an image search engine using Deep Learning. In summary, this talk will walk the audience through a series of fun demos, demonstrate how the simple idea of searching for similar images can make computers a somewhat intelligent assistant, and illustrate how to achieve that in a high level.

Dr. Yan Wang is a software engineer working on image understanding in Bing at Microsoft. He received his PhD in Columbia University in 2015 (supervised by Prof. Shih-Fu Chang). Yan has rich R&D experience in Microsoft, Adobe Research, and Facebook, with his algorithms patented and integrated in Bing Image Search, Facebook Graph Search and Adobe Photoshop, and featured on media such as NBCNews and MIT Technology Review. He held the Olympic Torch of Beijing Olympic Games as a torchbearer in 2008, won the Tech Draft (a nation-wide programming challenge) in 2014, and is a certified airplane pilot.

“Commercial and Civilian Applications of Unmanned Aerial Systems”

Dr. Christopher Lum

Unmanned Aerial Systems (UAS) are a disruptive technology with the potential to dramatically change the aerospace field. They have applications in search and rescue, remote sensing, persistent surveillance, agriculture and many others. This talk will present some of the past, present, and future work related to UAS at the University of Washington. It will cover theoretical systems and algorithm development as well as novel payloads and sensors such as multi-spectral imagers and magnetometers. The talk will also investigate issues related to transitioning technology to industry platforms as well as the regulatory environment associated with operating UAS as a public research entity.

Dr. Christopher Lum is a Research Assistant Professor in the University of Washington's William E. Boeing Department of Aeronautics & Astronautics. Dr. Lum received his PhD in from the University of Washington in 2009 while focusing on autonomous systems and algorithms. Dr. Lum's research encompasses various unmanned aerial systems technologies such as coordinated multi-vehicle searching, automatic target recognition, formation flight of swarms of vehicles, risk assessment of UAS in the national airspace system, collision avoidance/deconfliction, and UAS flight operations. He is the director of the Autonomous Flight Systems Laboratory where he investigates practical applications of autonomous systems. To this end, he pursues research projects involving precision agriculture and mapping using UAS, using optical information to augment autopilot control algorithms, and integration of UAS into the NAS. He has worked closely with industry partners such as the Boeing Company, Insitu, AeroVelo, Hood Technology, and the Washington Joint Center for Aerospace Technology Innovation to implement academic technologies onto deployed platforms. Dr. Lum teaches both undergraduate and graduate course on automatic control, flight mechanics, modeling and simulation, mathematical tools for engineers, sensors and actuators, and other controls related courses. He has been awarded the department's "Instructor of the Year" award twice (2012 and 2013). He is also the faculty advisor to the department's Design, Build, Fly team. He has served as an Adjunct Professor at Seattle University and as a Visiting Fellow at the Queensland University of Technology in Brisbane, Australia.