

Computer Science SEMINAR PRESENTATIONS

Carnegie Hall 113

Sep 27/19 2:30 pm

Jodrey School of Computer Science

SEMINAR PRESENTATION

Friday, September 27, 2019

2:30 PM

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In Vino Veritas: Estimating Vineyard Grape Yield from Images using Deep Learning

Dr. Danny Silver

Abstract: Agricultural harvest estimation is an important, yet challenging problem to which machine learning can be applied. There is value in having better methods of yield estimation based on data that can be captured with inexpensive technology in the field. This research investigates five approaches to using deep convolution neural networks (CNNs) to develop models that can estimate the weight of grapes on the vine from an image taken by a smartphone. The results indicate that a combination of image processing and deep CNN machine learning can produce models that are sufficiently accurate within a variety of grape for data captured at harvest time. The best approach involves transfer learning; where a CNN is developed starting from the weights of a pretrained density map model that learns to output the location of grapes in the image. The models achieve a mean average error (MAE) of 157 grams over a mean average weight of 1335 grams, or a MAE% of 11.8.

About the Presenter: **Dr. Danny Silver** is the Director of the Acadia Institute for Data Analytics. He is also a Professor in and former Director of the Jodrey School of Computer Science at Acadia University. His areas of research and application are machine learning, data mining, and data analytics and has published over 65 scientific papers in the areas of Transfer Learning and Lifelong Machine Learning. He

and has co-chaired or been part of program committees for a number of national and international conferences, seminars and workshops on data mining and machine learning. He was the President of the Canadian Artificial Intelligence Association (CAIAC) from 2007-09. In 2011, he received the Science Champion Award from the Nova Scotia Discovery Center for his work on youth robotics and the advancement of STEM education. From 2013 to 2018, he was an Honorary Colonel in the RCAF with 14 Wing Greenwood's 415 Squadron (formerly the Software Engineering Squadron). In 2016, he was awarded the Canadian AI's Distinguished Service Award and made a CAIAC Fellow. Danny has over 30 years of experience in information technology, project management and organization administration. Since 1993, he has worked on machine learning and data mining projects in the private and public sector providing situation analysis and problem definition, project management and guidance, and data mining services.

Everyone is welcome to attend
