



School of Computer Science

MSc Defence

Monday May 28, 2018 at 10:00 AM in MacKinnon, Room 313

Alexander Olpin

Convolutional Networks for Segmentation and Detection of
Agricultural Mushrooms

Chair: Dr. Stacey Scott

Advisor: Dr. Rozita Dara

Co-Advisor: Dr. Deborah Stacey

Non-Advisory Committee Member: Dr. Fei Song

ABSTRACT:

Previous research into agricultural crop identification has used standard image processing techniques to locate crops within captured image data. Convolutional Networks have been shown to achieve high levels of accuracy in image classification based tasks, and more recently have been applied to image segmentation tasks for the purpose of object identification. Region-based Convolutional Networks theorized and applied only recently, have the capabilities to augment the high levels of classification accuracies experienced with traditional convolutional networks, with object detection and localization through the integration of Region Proposal Networks.

The experiments conducted were done so using a newly constructed agricultural mushroom data set of sufficient size for the training of Convolutional Networks. In this work we found that a standard Convolutional Neural Network was able to achieve a 98.1% average precision rating, while a Fully Convolutional Network was able to achieve a 96.8% average precision rating in the area of mushroom segmentation. Furthermore, a Region-based Convolutional Neural Network was able to achieve a 92.1% average precision rating, while a Region-based Fully Convolutional Network was able to achieve an 87.6% average precision rating in the area of mushroom detection.