



## COLLEGE of ENGINEERING AND PHYSICAL SCIENCES

SCHOOL OF COMPUTER SCIENCE

# MSc Defence

**Monday December 19, 2022 at 1pm via Zoom (online)**

**Lyon Probyn-Smith**

*Identifying measures that represent the variance in  
novice programmers' code*

**Chair:** Dr. Gary Grewal

**Advisor:** Dr. Judi McCuaig

**Advisory:** Dr. Denis Nikitenko

**Non-Advisory:** Dr. Dan Gillis

### **Abstract:**

The motivation for this work is improvement to the ability of automated feedback systems to produce individualized feedback for novice programmers. Metrics (in industry) are used to discern attributes of software for a wide range of objectives, including quality assessment, and characterizing static or runtime attributes of the software. Using software metrics to analyse software developed by students may facilitate self-reflection and self-assessment. This exploratory research examines the relationships between statically calculated characteristics of student C code collected over 3 different semesters. Effort is taken to include a wide variety of measures initially, selecting measures showing high variation for analysis. PCA, for dimension reduction, is conducted on the selected metrics to facilitate observation of patterns across and within assignments. This research opens further possibilities of evaluation and comparison of students as well as educators.