School of
Computer Science

MSc Seminar

Monday June 4th at 1:30 PM in MacKinnon, Room 315

Exploring Metrics to Enhance Automated Feedback in Programming Courses

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ABSTRACT:

Software metrics are a versatile and useful category of algorithms for collecting a wide range of data from written code. They can be used to determine a level of quality based on the results of these metrics which in turn can be used to create improvements to the code base being analysed. While typically used for workplace applications, metrics can be just as reliable and consistent when used to study any code base, and as such can be a powerful learning tool for student programmers. Metrics can be utilized as a backbone for implementing Formative Learning techniques for students in a variety of programming classes where one-on-one instructor interaction may be limited. By using metrics to create automated "next steps" for these student programmers, the student has the option to work at their own pace and receive real-time feedback based on the metrics of the student's submitted code base in order to improve their code's quality. This system can be used in tandem with feedback and assessment from the course instructor to create a more comprehensive and student-driven learning experience.

This seminar will cover several important concepts in software metrics, computer science education and educational data mining. We will study the usage of metrics as a means to enhance Formative Assessment and examine preliminary results of metrics analyses, understand how we came to these results and outline a roadmap for the next steps when using metrics to enhance Formative Assessment techniques. There will be a discussion of the metrics which were used, how they were gathered and why they were chosen for the preliminary metrics analysis stage. We will also identify the essential difference between assessment, evaluation and feedback and why the metrics tools will assess and provide feedback instead of providing an evaluation.