**Predicting Higher Education At-Risk Student Using Progressive Temporal Data and Machine Learning Tools**

**Associate Professor Vincent CS Lee**

**Abstract**

Predicting student academic performance with machine learning techniques is an emerging research area in educational data mining. Various machine learning techniques have been used to investigate the educational context, particularly in predicting students who are at risk of failure. Patterns in the learning context can be used to discover student behaviour via learning analytics and data mining techniques to explore and exploit learning behaviours. As a result, early warning of at-risk-of-failing students will provide educators with valuable information while still promoting students' success at university.

Various data sources and types have been used to predict students’ academic performance via adaptive learning analytics and machine learning tools. Existing research recognizes the critical role played by machine learning techniques in education. One of the current issues when solving a problem using machine learning techniques is the lack of explanation of a generated model. Machine learning techniques create a better prediction model for identifying at-risk students based on a massive amount of their progressive temporal data. An education domain expert may not trust the prediction results generated by machine learning techniques. We need better interpretation of prediction models so that educators can understand why a machine learning technique created a particular prediction result. This study fills the gaps of the current literature by addressing three research questions:

RQ1: What is the theory related to computer-based with online learning activities?

RQ2: What are the features affecting student academic performance?

RQ3: Which data mining tools provide more explanatory information to the educators?

A case study will be included in this presentation.

**Keywords**

learning analytics; identifying at-risk students; educational data mining; predictive

learning model; and interpretable model.