SUBJECT DESCRIPTION FORM

Subject title: Advanced and Research Topics in Machine Learning

Subject Code: COMP6828

Credit Value (Applicatble to Postgraduate Schemes under the Credit-based System):
3

Modular value (Applicable to Modular Postgraduate Schemes):
1

Responsible staff and department:

Daniel S. Yeung (COMP) and Eric Tsang (COMP)

Pre-requisite: (Subject Title and Code No, if any)

Nil

Recommended Background Knowledge:

Nil

Mutual Exclusion:

Nil

Learning Approach:

Students are required to do in-depth reading of research papers on a regular basis. They will make presentations on materials they learn, and staff will provide regular feedbacks on their progress by holding discussion sessions, giving written quizzes if necessary, and reviewing papers submitted by the students to conference/journal. A final report is required and an oral examination will be held.

Assessment:

Continuous Assessment: 45%
Examination: 55%

Objectives:

- To provide students with opportunity to learn up-to-date knowledge in the area of machine learning.
- To help students develop necessary research aptitude and skills.
- To prepare students well in oral and written presentation techniques.

Keyword Syllabus:

Topics to be selected from the following:

- Wavelet
- Neural Networks
- Support Vector Machines
- Case Base Reasoning
- Fuzzy Reasoning and Fuzzy Production Rules
- Decision Tree
- Applications in Machine Learning
    - Pattern Recognition
    - Network Anomaly Detection
    - Feature Selection and/or Extraction
    - Time Series Prediction

Inductive Reading List and References:

- IEEE Transactions on Neural Networks, Fuzzy, PAMI, SMC part B.
- Neural Computation
- Neurocomputing
- Neural Networks
- Machine Learning
- I. Daubechies, “Ten Lectures on Wavelets”, Rutgers University and AT&T Bell Laboratories
- Tom Mitchell, “Machine Learning”, McGraw Hill, 1997