CS Masters' Thesis Defense

Title: *Application of Ant-Based Technology in Selection of Glycan Markers for Cancer Detection*

Speaker: Haofei Fang

Date: Monday, May 21, 2012

Time: 10:00 a.m.

Location: GMCS 405

Thesis advisor: Dr Marko Vuskovic

Abstract:

Recent advances in computer technology and in molecular biology have greatly influenced and promoted the field of bioinformatics. Parts of these advances are new high throughput platforms for biomarker discovery and new algorithms for feature selection and classification. This thesis is dedicated to a class of feature selection and classification algorithms that are based on a new paradigm of artificial intelligence and pattern recognition known as swarm intelligence. A particular algorithm considered is "Ant Colony Optimization (ACO)" which is applied to a recently emerged biomarker platform based on printed glycan arrays (PGA). The thesis proposes an implementation of the ACO which is specially tuned for diagnosis of cancer using PGA data. The implementation is evaluated on real clinical data obtained from the School of Medicine of NYU, which contain 65 control samples of high-risk subjects exposed to asbestos and 50 subjects diagnosed with malignant mesothelioma. The results are compared to artificially generated data which have general characteristics similar to the original real data.