



**DEPARTMENT OF COMPUTER SCIENCE**

**PhD Degree Oral Presentation**

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Time:	27 August 2008 (Wednesday) 10:30 am – 12:30 pm (35 mins presentation and 15 mins Q & A)
Venue:	FSC 1111, Fong Shu Chuen Library, HSH Campus

**“Regularization Methods for Support Vector Machines”**

**Abstract**

The presentation focuses on SVM-related regularization methods, which tackle machine learning tasks via an objective function combining a penalty term and a loss criterion, as balanced by regularization parameters. Under the regularization framework some novel criteria like zero-norm, maximum entropy, and graph operator are implemented, which bring improved performance on regression, classifier ensemble and semi-supervised learning tasks.

The second part of the presentation analyzes how the regularization parameters affect the solution of regularization models. An efficient algorithm is developed to trace the piecewise linear solution paths for a broad family of SVMs. Based on parametric quadratic programming (PQP), a unified approach for solving solution paths in a systematical and robust way will be presented. Compared with existing approaches, this method is in a principled manner and generalizes many SVM variants. In addition, a thorough study on the degenerated cases in tracing solution paths is conducted, and efficient methods to handle degenerated cases are proposed. Furthermore, the approach has drawn a novel relation with classic Mean-Variance portfolio optimization techniques and the critical line algorithm.

**\*\*\* ALL INTERESTED ARE WELCOME \*\*\***