1077-62-112   **Jacob A Gagnon*** (`jgagnon@wpi.edu`), Department of Mathematical Sciences, Worcester
Polytechnic Institute, 100 Institute Road, Worcester, MA 01609. *Identifying Gene Set Differences
Between B-cell and T-cell Acute Lymphocytic Leukemia.* Preliminary report.

Gene set analysis allows us to determine which groups of genes are expressed differently when comparing two groups of individuals. For example, a researcher might want to compare a diseased group with a control group or compare two subtypes of a given disease. In this talk, we propose a new gene set analysis approach using a logistic kernel machine. This approach has some key advantages over previous work, namely the modeling of complex pathway effects, gene-gene interactions, and covariate effects. Results from simulation studies show that our estimation approach is comparable to better than Bayesian approaches at a much lower computational cost. As for hypothesis testing, simulation results show an increased power compared to a score test approach. Finally, we apply our methods to determine gene set differences between B-type and T-type Acute Lymphocytic Leukemia. (Received July 27, 2011)