

McMASTER UNIVERSITY
GRADUATE PROGRAM IN STATISTICS

STATISTICS SEMINAR

Speaker: Dr. Mu Zhu, Department of Statistics and Actuarial Science,
University of Waterloo

Title: *“An Adaptive Radial Basis Function Network Model for
Statistical Detection”*

Day: Tuesday November 9, 2004

Time: 3:30 - 4:30 PM

Place: HH/217 - Deloitte Colloquium Room (Refreshments in HH/216
at 3:00 PM)

SUMMARY

We construct a special radial basis function (RBF) network model to detect items belonging to a rare class from a large database. Our primary example is a real drug discovery application. Our method can be viewed as modeling only the rare class but allowing for local adjustments depending on the density of the background class in local neighborhoods. We offer a statistical explanation of why such an approach is appropriate and efficient for the detection problem. Our statistical explanation together with our empirical success with this model has implications for a new paradigm for solving these detection problems in general. This work is joint with Wanhua Su and Hugh Chipman.

REFERENCE

Zhu, M., Chipman, H. A. and Su, W. (2003). "An Adaptive Method for Statistical Detection With Applications to Drug Discovery." In 2003 Proceedings of the American Statistical Association, Biopharmaceutical Section [CD-ROM], pp. 4784--4789. Available from <http://www.stats.uwaterloo.ca/~m3zhu/papers/jsm2003.pdf>

ABOUT THE SPEAKER: Dr. **Mu Zhu** is an Assistant Professor of statistics in the Department of Statistics and Actuarial Science at University of Waterloo. He obtained his A.B. *magna cum laude* from Harvard University and his Ph.D. in statistics from Stanford University. In his Ph.D. research Zhu worked with Professors Trevor Hastie (principal advisor), Robert Tibshirani and Jerome Friedman. He worked for a litigation consulting firm in New York before doing graduate studies, and as a consultant/director for a number of Fortune 500 and Internet start-up companies in finance, music, entertainment and bioinformatics during his Ph.D. studies. He is a member of the Institute of Mathematical Statistics, the Statistical Society of Canada, the American Statistical Association and the *Phi Beta Kappa*. Part of his Ph.D. thesis won the Student Paper Competition Award from the Computing Section of the American Statistical Association in 2001. At Waterloo, Zhu is cross-appointed by the School of Computer Science. He is married and lives with his wife and a son in Waterloo. Zhu's current research interests include multivariate analysis, pattern recognition, dimension reduction, variable selection, detection and retrieval of rare items from large databases, global optimization, and data visualization.

For more information, please contact Román Viveros at (905) 525-9140 ext. 23425,
e-mail: rviveros@math.mcmaster.ca
<http://icarus.math.mcmaster.ca/rviveros/StatsSem.html>