

COLLOQUIUM

DEPARTMENT OF MATHEMATICS AND STATISTICS
OAKLAND UNIVERSITY
ROCHESTER, MICHIGAN 48309

David Gorsich
Senior Research Scientist
U.S. Army TACOM

NONPARAMETRIC ESTIMATORS FOR SPATIAL STATISTICS WITH APPLICATIONS

Abstract

Several topics related to spatial statistics will be discussed. These topics revolve around nonparametric estimators of the covariogram and variogram. The topics will include:

1. Spatial design matrices for estimating the variogram of a spatial stochastic process. This design matrix involves Kronecker products of second order finite difference matrices, with cosine eigenvectors and eigenvalues. Using the eigenvalues of the spatial design matrix, the statistics of Matheron's variogram estimator are determined.
2. Nonparametric estimation of isotropic covariograms involving the use of Fourier-Bessel matrices. These matrices and the representation of covariograms nonparametrically will be discussed. Several properties of these estimators will be discussed utilizing Fourier-Bessel expansion results.
3. Spatial statistics applications important to the U.S. Army. The role of spatial statistics in terrain characterization will be briefly discussed.

372 Science and Engineering Building

Thursday, October 4th, 2001

3:00 to 4:00 P.M.

**(Refreshment at 2:30 to 3:00 P.M. in Room 368,
Science and Engineering Building)**

About the speaker

Dr. Gorsich is currently the Senior Research Scientist of National Automotive Center (NAC), U.S. Army Tank-Automotive and Armaments Command. He earned his B.S.E.E. from LTU in 1990, M.S. (Applied Mathematics) from GWU in 1994, and Ph.D. (Mathematics) from MIT in 2000. He is also NAC Team Leader for Vehicle Intelligence and Safety, director of TARDEC Robotics Laboratory, and Government Director of Automotive Research Center (ARC) at the University of Michigan. His current research interests are approximation and spatial statistics, robotics, and vehicle intelligence.