



Department of Biomathematics Seminar Series:  
Frontiers in Systems and Integrative Biology

BIOMATH

# Minorization-Maximization Algorithms for Variance Components Models



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**4:00 PM**

**A2-342 MDCC**

**Moss Auditorium, Marion Davies Children's Clinic**

## **ABSTRACT:**

Variance components estimation and mixed model analysis are central themes in statistics with applications in numerous scientific disciplines. Despite the best efforts of generations of statisticians and numerical analysts, maximum likelihood estimation and restricted maximum likelihood estimation of variance component models remain numerically challenging. In this talk, we present a novel iterative algorithm for variance components estimation based on the minorization-maximization (MM) principle. MM algorithm is trivial to implement and competitive on large data problems. The algorithm readily extends to more complicated problems such as linear mixed models, multivariate response models possibly with missing data, maximum a posteriori estimation, penalized estimation, and generalized estimating equations (GEE). We demonstrate, both numerically and theoretically, that it converges faster than the classical EM algorithm when the number of variance components is greater than two. This talk is accessible to graduate students especially those taking BIOMATH 210.

Host: Mary Sehl, M.D., Ph.D.

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