



The University of Chicago  
Department of Statistics

## Mini-seminars for First Year Ph.D. Students

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**NAIQING GU**

Department of Statistics  
The University of Chicago

### **A Limit Theorem for Hidden Markov $\alpha$ -chains**

**WEDNESDAY, May 30, 2007 at 4:45 PM**  
**110 Eckhart Hall, 5734 S. University Avenue**

### **ABSTRACT**

This talk is based on the papers “A Limit Theorem for Partially Observed Markov Chains” (Kaijser, T., Ann. Prob. 3 677-696) and “A Simple Proof of Kaijser’s Unique Ergodicity Result for Hidden Markov  $\alpha$ -chains” (Kochman, F. and Reeds, J., Ann. Appl. Prob. 16 1805–1815). For an HMM, its  $\alpha$ -chain is  $\{\alpha_n\} = \{(\alpha_{ni})\}$ , where  $\alpha_{ni} = P(X_n = i | Y_n, Y_{n-1}, \dots)$ . Kaijser has shown that this  $\alpha$ -chain is a Markov Chain. A limit theorem of the  $\alpha$ -chain will be presented, and possible applications will be discussed.