



The University of Chicago  
Department of Statistics

Master's Seminar

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**Long Memory and Conditional Heteroscedasticity in Network Data**

**FRIDAY, November 10, 2006 at 8:30 AM**  
**110 Eckhart Hall, 5734 S. University Avenue**

### **ABSTRACT**

Network traffic modeling is an important area of research in many problems such as congestion control, admission control, network planning and resource management. A reliable traffic model is essential for the goal of efficient network traffic prediction. It is believed that network traffic data may exhibit interesting characteristics, such as heavy tails, self-similarity and long-range dependence (LRD). In this paper we propose a network traffic model combining the linear time series fractionally autoregressive integrated moving average model (FARIMA) with the non-linear autoregressive conditional heteroscedasticity (ARCH) innovations. The presence of conditional heteroscedasticity has been largely ignored in the literature of traffic data. Our integrated procedure of FARIMA models with ARCH innovations is applied to a large telecommunication network traffic data. The results indicate that ARCH effect do exist in the residuals of FARIMA model, and thus help capture the volatility of network data.