The University of Chicago
Department of Statistics
Master's Seminar

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"Sleep Stage Classification by EEG Wave"

TUESDAY July 19, 2005 at 11:00 AM
110 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

Electroencephalogram (EEG) has been used to show the electrical activities of the brain, and therefore it has been proved a powerful channel to obtain latent brain state of subjects. In this work, we try to extract the information on the sleep stage of birds by the measured EEG wave. We analyze the EEG signal in frequency domain by various techniques. In particular, we compare hidden Markov model (HMM) and a Mixed Gaussian model for the estimated spectral density in multiple frequency bands, by using maximum-a-posterior (MAP) criterion to classify the hidden state. The effectiveness of the approaches is compared in both simulations and application to the real data set. Some related issues in model assessment is also discussed.