1032-68-166 **Sergey M Plis*** (pliz@cs.unm.edu) and **Terran Lane** (terran@cs.unm.edu). *Dynamic Bayesian Networks for joint analysis of functional neuroimaging data.* Preliminary report.

Knowledge of functional connectivity of brain regions can greatly enhance our understanding of how the brain works. Although current neuroimaging technologies provide detailed information about anatomical structure, functional structure remains unclear. In this talk, we present an approach to combining magneto-encephalography (MEG) data with functional magnetic resonance imaging (fMRI) data for estimation of functional connectivity of brain regions. These two techniques measure different aspects of neural activity, hence provide complementary information about brain function. The combination is realized in the framework of Dynamic Bayesian Networks (DBN). DBNs provide a data-driven framework for inferring the nonlinear, multivariate networks that arise in functional connectivity analysis. The topological structure and parameters of the estimated DBN provide information about functional relationships of different regions of interest (ROI) of the brain. In DBNs ROIs are treated as hidden variables whose state can only be inferred from the observed MEG and fMRI measurements. Structure search in the presence of hidden variables is a challenging problem that poses additional difficulties when the variables are continuous. The talk represents ongoing research. (Received August 21, 2007)