VanBUG

presents Guest Speaker :

Martin McKeown

http://www.parkinsons.ubc.ca/Dr.MartinJ.McKeown.htm

Dept. of Electrical and Computer Engineering, UBC

Biomedical Signal and Image Computing Lab (BiSICL), UBC

What can computational approaches teach us about Parkinson's Disease?

Parkinson's disease (PD) is the second most common neurodegenerative disease in Canada, after Alzheimer's disease. Although treatments (both medical and surgical) are available for PD, and can have dramatic beneficial effects especially early in the disease, they treat the symptoms of the disease without altering the overall progression. Using fMRI, we can non-invasively probe the normal and parkinsonian brain, but the data require extensive processing to get meaningful results. We will discuss the roles of Independent Component Analysis (ICA), Dynamic Bayesian Networks (DBNs), Probabilistic Boolean Networks (PBNs), Large Deformation Diffeomorphic Metric Mapping (LDDMM), replicator dynamics, as well as 3D moment invariants in the analysis of these data sets. Additionally, we will describe how second order linear dynamical system theory can be applied to manual tracking data from PD and normal subjects. Finally, since recent research has demonstrated that functionally, the Parkinsonian state is characterized by the emergence of pathological oscillations in the beta range (12-30 Hz) within basal ganglia/cortical loops, we will describe how frequency-domain analysis, such as partial directed coherence (PDC) can be used to investigate the electroencephalogram recordings from PD subjects. These technologies will be put in the context of exploring compensatory mechanisms in PD, capable of ameliorating overall disability.

Student Presentation (10 mins):

Cydney Nielsen, Jones lab (GSC)

Genomic Data Visualization: Making Sense of Large-Scale Data Sets

Thursday, December 11, 2008, 6:00 pm

Gordon and Leslie Diamond Family Theatre,
BC Cancer Research Centre,
675 West 10th Avenue

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