UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING
Department of Electrical & Computer Engineering

MS Thesis Announcement

Automated Extraction of Brain Cell Layers using Cell Networks and Active Machine Learning

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The cortex of the brain consists of layers of cells which differ in morphology and spatial distribution. The thesis contributes methods and tools to quantify the spatial distributional properties of the neurons such as their density and the distance from the cortical surface using efficient graphical data structures. It also presents the application of an actively trained logistic regression classifier to the problem of delineating the layers by classifying the neurons as belonging different layers based on the morphological and spatial properties. The proposed approach is applied to diverse datasets acquired from different cortical areas and it consistently achieves an accuracy of around 90% in delineating the laminar boundaries. It also proves to perform better than unsupervised learning methods and to be more efficient and accurate compared to unaided manual training of classifier.

Committee Chair: Dr. Badrinath Roysam   Place: ECE Conference Room
Committee Members: Dr. Thomas Hebert   Date: November 16, 2012
                     Dr. Shishir Shah   Time: 10:00 AM