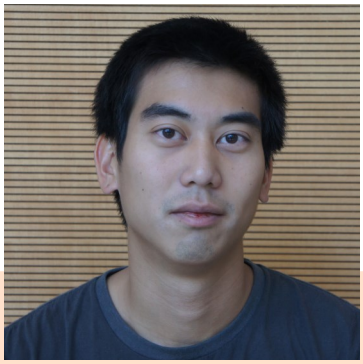
Medical Physics Seminar

Monday, April10th, 2017

1325 HSLC ~ 4:00 P.M.

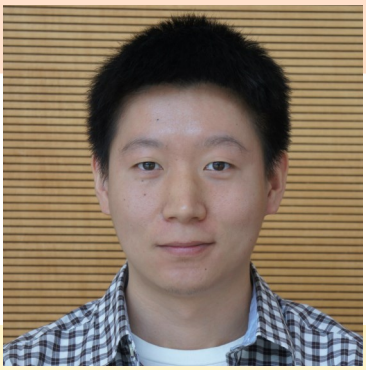


Patrick Lao, MS
Research Assistant
Student of Dr. Brad Christian

PET imaging of Alzheimer's Disease in Down Syndrome

PET is a versatile and powerful tool for functional neuroimaging that can provide quantitative information about target density. In the Down syndrome population, the genetic predisposition to early amyloid accumulation and the high incidence of Alzheimer's disease provide strong support for a pathogenic role of amyloid. This talk will cover a multimodal approach to imaging the Alzheimer's disease pathophysiological process in the at-risk Down syndrome population for which it is essential to track the natural disease progression of several biomarkers in a longitudinal study design. For atypical populations, special consideration must be placed on spatial normalization, tissue type segmentation, region of interest and threshold (between healthy and diseased) determination since existing methods rely on templates built from data collected in healthy controls.

Additionally, we have investigated PET radiotracers for biomarkers outside of the typical amyloid cascade hypothesis, but consistent with neurodegenerative disease. The applications of these radiotracers range from imaging neuroreceptor systems to neuroinflammation, and results will be presented for mouse, non-human primate, and human PET studies.



Wenjun Yang
Research Assistant
Student of Dr. Tomy Varghese

Monitoring Microwave Ablation for Liver Cancer Using Ultrasound Strain Imaging

Microwave ablation is a minimally invasive percutaneous treatment method for liver cancer, with promising treatment outcome especially for early stages. However, the size of the ablated region is difficult to be monitored with the guidance imaging modality, ultrasound B mode imaging. We developed an ultrasound strain imaging technique, "electrode displacement elastography (EDE)" to analyze the Young's modulus of the local tissue, and to delineate the size of the ablation zone based on the stiffness contrast. Improved delineation ability was observed over 90% of patients involved in our study compared with ultrasound B mode imaging and another ultrasound elastography technology, "ARFI", which is widely implemented in commercial systems.

1325 Health Science Learning Center (HSLC) 4:00 - 5:00 P.M.