(SAMPLE)

ELEC 599 Project Abstract and Timeline

Student: YOUR NAME
Advisor: ADVISOR NAME
Title: Accurate Quantification of PET Imaging

Abstract:
PET is a functional imaging modality that generate images showing biological processes in the body such as Glucose metabolism, blood flow or receptor density. PET has the ability to accurately quantify the activity concentration in tissues. This ability is unique to this imaging modality. There are several factors that affect the accuracy of PET image quantification, such as scan duration, count density, scan mode, reconstruction method, etc. All these factors can impact the spatial resolution and sensitivity of the PET images. The objective of this 599 project is to identify and evaluate the impact of these factors as well as introduce mechanisms to correct for them. Our investigation will be based on the phantom studies and patient studies in MD Anderson Cancer Center. An IEC phantom containing 6 spheres will be scanned on a GE DRX PET/CT scanner. PET data will be acquired on different conditions and reconstructed. ROIs will be drawn on all 6 spheres of the resulting images. Mean and max activity concentration (AC) as well as CNR was calculated and plotted for all spheres in all scans. In addition, SNR was calculated as the ratio of mean sphere AC to the STD of 60 randomly selected pixels in the background. Upon these, we can evaluate the impact of different factors and try to find mechanisms for correction. Afterwards, patient data will also be acquired to further investigate and testify our corrections.

Timeline:

Time	Task	Detail
Jan. 28th ~ Feb. 8th	Phantom Scan	Scan the IEC phantom with different factors
Feb. 9th ~ Feb. 24th	Combination and reconstruction	Sinograms will be reconstructed, using different methods
Feb. 25th ~ Mar. 14th	Data Processing and Analysis	SNRs of different combinations will be calculated and plotted for analysis
Mar. 15th ~ Mar. 31st	Patient Study	Analyze PET image quality on real patient data
Apr. 1st ~ Apr. 13th	Final Report	The final report will be written as a journal paper format and be submitted if possible