FACULTY MENTOR
Obrzut, Sebastian

PROJECT TITLE
Signal Processing of Parkinson's Disease Tremor Data from Virtual Reality Application
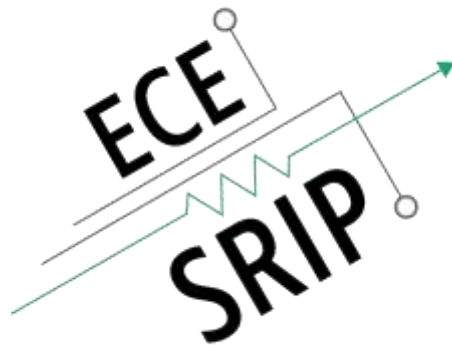
PROJECT DESCRIPTION
Our lab has developed a Virtual Reality (VR) application to evaluate progression of Parkinson's Disease (PD). Patients undergo I-123 DaTscan SPECT/CT brain imaging, followed by PD questionnaires and VR testing. VA application detects the location and angular position of two controllers. The purpose of the project is to extract dominant tremor frequency from the data by filtering low frequency and high frequency noise. There are 3 students already funded for this project by Radiological Society of North America to collect patient data with VR.

INTERNS NEEDED
1 BS or MS student

PREREQUISITES
Matlab

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PROJECT TITLE
Deep Learning SPECT Medical Image Reconstruction
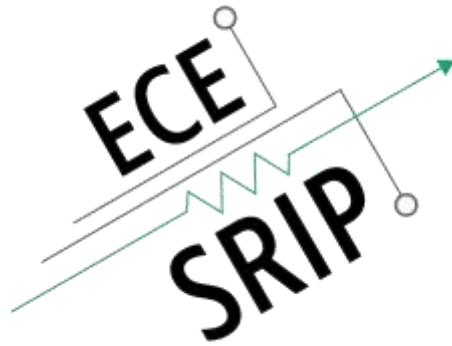
PROJECT DESCRIPTION
SPECT imaging is used to diagnose various diseases, including heart disease, Parkinson's disease, bone malignancy. Patient images are obtained as projections at various angles. The objective of the project is to combine deep learning with standard image reconstruction techniques such as OSEM reconstruction to decrease patent imaging time, decrease radiation exposure and improve image quality. This project has received renewed GEM ACTRI funding for a PhD student.

INTERNS NEEDED
1 BS or MS student

PREREQUISITES
Matlab, Python, background in deep learning

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PROJECT TITLE
Compressive Sensing Absorber for Molecular Breast Imaging

PROJECT DESCRIPTION
We have build a Compressive Sensing Absorber prototype for 3D Molecular Breast Imaging (MBI). The purpose of this imaging system is breast cancer detection. The prototype has just received a provisional patent status at UCSD. The purpose of the project is to collect more phantom data, perform and improve image reconstruction with compressive sensing using Matlab and CVX optimization software.

INTERNS NEEDED
1 BS or MS student

PREREQUISITES
Matlab