

FACULTY MENTOR Garudadri, Hari

PROJECT TITLE Hardware design for a wearable, realtime, open speech platform

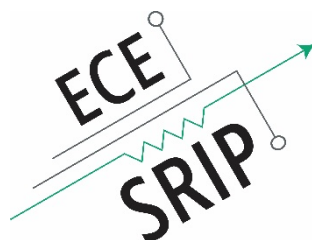
PROJECT DESCRIPTION

We are developing an open speech platform that functions as a reconfigurable hearing aid <http://openspeechplatform.ucsd.edu>. Our clinical collaborators (Audiologists and Hearing Scientists from SDSU and other universities) will use this platform for improving hearing healthcare for those with hearing impairments and associated disorders. The system is based on a single board computer (SBC) with digital signal processing (DSP) accelerator for hosting advanced signal processing. The intern will work with prototyping laboratory at Qualcomm Institute, Calit2 to miniaturize the SBC for a wearable form factor. The task is to design a printed circuit board assembly (PCA) that includes a system on chip (SoC) with CPU+DSP, wireless modem, battery management and audio codecs. He/she will combine schematics from multiple reference designs, create a new schematic, develop layout, fabricate PCA, testing and verification of PCA, assist in 3D-printed enclosures, etc. This project is ideal for a student wanting to develop advanced board development skills and hardware design.

INTERNS NEEDED 1 MS Student OR 1 Undergrad Student

PREREQUISITES

Candidates are expected to have basic knowledge in analog and digital circuit design, experience designing printed circuit boards using commercial schematic capture and layout tools (e.g., Altium, Eagle, Orcad, etc.) and some prototyping experience.



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PROJECT TITLE Quantifying degree of abnormality in movement tasks by Parkinson Disease (PD) patients

PROJECT DESCRIPTION

We are working with Movement Disorder Center in the Department of Neurosciences at SoM to improve diagnosis and care of PD. We have a large corpus of video data in which patients performed specific tasks and clinicians graded the degree of abnormality on a 5-point scale of 0–4. The goal of this project is to develop feature extraction and machine learning techniques to estimate objective metrics that (a) correlate with the 5-point subjective assessments by experts and (b) enhance the resolution of these objective metrics beyond the 5-point scale currently used in PD patient care. The intern will develop object identification and tracking algorithms. The objects include tapping feet, tapping fingers, finger touching nose, walking feet, etc.

INTERNS NEEDED 1 MS Student OR 1 Undergrad Student

PREREQUISITES

Candidates are expected to have basic knowledge of image processing and computer vision, and have experience of C/C++ and Python/MATLAB.

