Current Grants

- **NSF SCC-IRG grant**
  [Co-PI; project duration: 3 years; $ 1,215,370]

  The project investigates the social and technical challenges of adopting sensor-based technologies, such as tele-mental health services. The project will explore the issues using a combination of surveys and an innovative "lean design" approach. Lean design refers to developing a solution in an iterative way with rapid development of prototypes that can be quickly evaluated and the lessons learned applied to the next iteration. This approach includes the community partners in the design and evaluation of technology prototypes.

- **Mercury Defense Systems** research grant
  [Sole Investigator; project duration: 3 years; $300,000]

  The project involves developing a hardware-software solution that would survey the radio frequencies (RF) in an environment and classify it based on predetermined need and prior knowledge. This system, that learns with experience, will be part of airborne radar systems.

- **SoCal Gas Grant**
  [PI; project duration: 1 year; $15,000]

  The objective of the project is to develop a self-sustaining carbon capturing system developed to absorb and store carbon dioxide from indoor/outdoor atmospheres leaving the air fresher. This system, in the form of an artificial tree, monitors CO2 levels continuously and absorbs excess CO2 above an acceptable level.

Past Grants

- **U.S. Department of Veterans Affairs** research grant
  [PI; project duration: 2 years; $200,000]

  The overarching goal of this effort is to develop a low-cost robotic aid system that can be rapidly trained to semi autonomously perform visuospatial tasks utilized in typical activities of daily living (ADLs), and which can be easily used by visually impaired persons.

- **Cisco Digital Economy Initiative** grant
  [Co-PI; project duration: 3 years; $296,253]

  The objective of the project is to develop an industry-focused IoT curriculum that will enable students graduating from this program to be competitive when applying for jobs in the local IoT industry and be productive as soon as they begin their career.

- **Keck Foundation:** BS in Engineering with Biomedical Device Engineering Option
  [Co-PI, $300,000, 36 months]

  The objective of the project is to develop BS in Engineering degree program with Biomedical Device Engineering option; the program is an interdisciplinary engineering program integrating medical device, assistive and rehabilitative technology research and project activity by undergraduate students, faculty mentors, and industry partners.

- **Mercury Defense Systems** research grant
  [Sole Investigator; project duration: 2 years; $100,000]

  The objective of this effort is to design and implement a signal classification algorithm capable of cognitive learning for wideband non-coherent digital receivers. The receiver is able to classify multiple simultaneous radar signals with low false alarm rate based on the signal environment, attributes and cues, while simultaneously enhancing its knowledge base through cognitive learning.

- **NSF CAREER grant** [project duration: 5 years; $400,000]

  The objective of this effort is to design and implement an intelligent wideband digital receiver capable of achieving a "near-zero" false alarm rate and a high instantaneous dynamic range by ascertaining the legitimacy of signals while categorizing and tracking incoming signals based on the signal environment, attributes and cues, and simultaneously enhancing its knowledge base.

- **NSF S-STEM grant:** [PI; project duration: 5 years; $598,000]

  This project establishes the ECS Academic Catalyst for Excellence (ACE) Scholarship Program, a comprehensive educational support system designed to ensure student success. The scholarship will serve as a catalyst that will allow students to focus diligently on their academics. The program will award scholarships to 54 ECS students over 5 years, and leverage a well established network of ECS and University student services to support cohorts of ACE scholars majoring in ECS disciplines.

- **Disability Communication Funds** [Sole Investigator; project duration: 1 year; $100,000]

  The overarching goal of this project is to design and pilot test a low-cost Electrooculography (EOG) based electronic communication system (estimated cost to be under $100). This system will enable ALS patients to effortlessly access the internet and communicate via e-mail, text, chat, Skype, using only eye movements, blinks and eye brow raises.

- **NSF I-Corps grant** [PI; project duration: 6 months; $50,000]
  The proposed work involves developing an innovative human-technology interface (HTI) system, which allows users to operate and interact with electronic devices solely with expressions and thoughts. The proposed HTI system, with a mobile app as the user interface, will utilize self-learning algorithms along with low-cost commercially-off-the-shelf (COTS) brain-computer interface (BCI) technology.

- **Disability Communication Funds** [Sole Investigator; project duration: 1 year; $100,000]

  The overarching goal of this project is to design and pilot test a low-cost brain-computer interface (BCI) based electronic communication system (estimated cost to be under $150). This system will enable ALS patients to effortlessly access the internet and communicate via e-mail, text, chat, Skype, using mental thoughts, facial expressions and head movements, with minimal training.

- **NSF BRIGE grant** [Sole investigator; project duration: 3 years; $174,795]

  The project aims to advance the digital receiver technology using a hybrid high performance computing platform. The main effort of this work will center on intelligently partitioning the signal processing tasks of the receiver to optimally utilize the best features of COTS hardware accelerators. The proposed receiver design capable of high-resolution spectrum estimation will provide remarkable improvement in performance over its predecessor

- **US Army Research Lab grant** [Sole investigator; project duration: 1 year; $122,243]

  The technical objective of this effort is to establish an innovative research that will design and implement a digital radar receiver system comprising of multiple wideband receivers to achieve an ultrawide instantaneous bandwidth (IBW) along with a high instantaneous dynamic range (IDR) and frequency resolution (FR). The proposed system, implemented on a hybrid accelerator cluster comprising of both off-the-shelf graphics processing units (GPUs) and field-programmable gate arrays (FPGAs), acquires signal data at an aggregate rate of 6GB/sec and is capable of real-time simultaneous multiple signal detection. Using several advanced DSP techniques, the proposed receiver system drastically improves its performance over its predecessor designs

- **NSF REU grant** [supplementary grant as part of NSF BRIGE grant; $6000]

- **Engaging Students in Engineering Minigrant** [Stevens Institute subaward to CSUF; Everyday Examples in Engineering Co-Lead; project duration: 1 year; $10,000]