ENGR 491-512: VIRTUAL-REALITY ENHANCED EXOSKELETON FOR REHABILITATION CONTROLLED VIA REVERSE ENGINEERING THE CENTRAL NERVOUS SYSTEM

Our Grand Challenge
In accordance with the goals of AggiE-Challenge, we aim to provide engineering undergraduates with opportunities to engage in multidisciplinary research focused on engineering challenges facing our society.”

Who:
Sophomores, juniors, and seniors, in the area of Computer science and Engineering, Biomedical Eng., Electrical Eng., Mechanical Eng., Industrial and systems Eng., Engineering Technology and Industrial Distribution and Aerospace Engineering with solid basic engineering knowledge, and interest in Game Development, EMG and EEG signals, Matlab and Robotics in general.

Expected Tasks are
• Developing games in virtual reality environment to be linked with the exoskeleton
• Recording and signal processing of EMG and EEG Signals to detect intention by signal classification

Interested?
Send your resume to rana.soltani@tamu.edu or amin.zeiaee@tamu.edu

Project Description:
Focus of this project is on control of the upper limb rehabilitation exoskeleton called CLEV-ERarm developed in our lab at Laboratory for Control, Robotics and Automation (LCRA) using bio-signals. To enhance the rehabilitation process, trainings will be developed in a virtual reality environment and will be linked to the exoskeleton. Also muscle and brain signals of patients will be used to control the device. Thus the research effort will include programming, game development, signal processing, machine learning and etc.. Students will gain valuable experience in dealing with robotic systems and theoretical and practical challenges which can prepare them for the demands of industry and research sectors. Students will need to register for credit hours.

Beneficial Opportunities for Students are:
• Working within a multidisciplinary team
• Opportunity to work on state of the art research problems
• Obtaining knowledge on implementation and control of robotic systems