

### **FACULTY MENTOR**

Pamela Cosman

### **PROJECT TITLE**

Detection of conversational engagement cues

### **PROJECT DESCRIPTION**

Description: The goal of this project is to measure social engagement in a conversation using augmented reality glasses. Cues such as nodding one's head or saying "yeah" show social engagement, and these conversational feedback behaviors (called backchannels) are often lacking in individuals on the autism spectrum. This project aims to detect head nodding and speech backchannels by applying machine learning and signal processing approaches to audio, video, and IMU data from AR glasses.

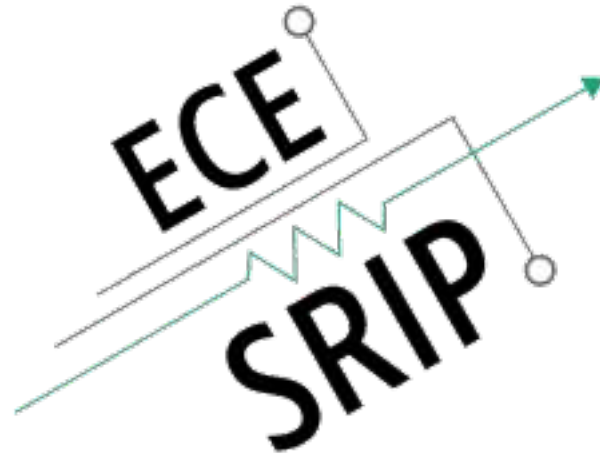
### **INTERNS NEEDED**

3 total (1-2 BS and 1-2 MS)

### **PREREQUISITES**

Preferred Qualifications:

1. Experience with either machine learning or speech/image/video processing



### **FACULTY MENTOR**

Pamela Cosman

### **PROJECT TITLE**

Eye-tracking to detect attention and distance to multiple faces

### **PROJECT DESCRIPTION**

Description: This project aims to use eye-tracking glasses to detect attention to multiple faces as well as interpersonal distance during conversation. Machine learning algorithms for face detection are well developed; using these algorithms we aim to develop methods that can determine how many people are in a conversation, how the person wearing the glasses is dividing their gaze time among different faces in the group, and what is the distance to other people.

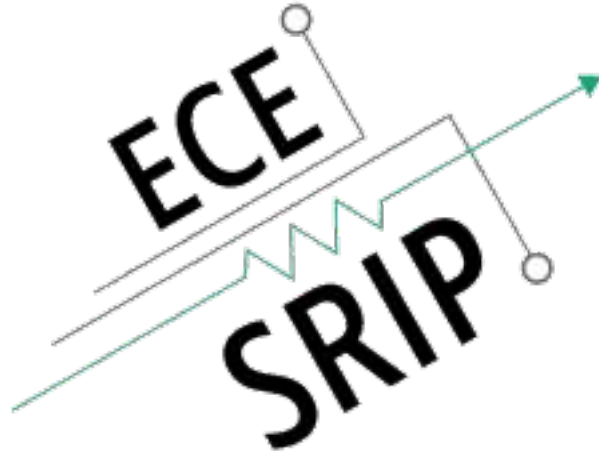
### **INTERNS NEEDED**

3 total (1-2 BS and 1-2 MS)

### **PREREQUISITES**

Preferred Qualifications:

1. Experience with either machine learning or speech/image/video processing



### **FACULTY MENTOR**

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### **PROJECT TITLE**

360-degree video streaming

### **PROJECT DESCRIPTION**

Description: When 360 degree video is streamed to a user, a large savings in bits can be achieved by transmitting at lower quality those portions of the video where the user is not looking. This project aims to develop video compression methods that adapt video quality in a region-based way in response to head motion trajectories and fluctuating channel conditions.

### **INTERNS NEEDED**

1 BS or MS

### **PREREQUISITES**

Preferred Qualifications:

1. Experience with image/video processing