Draper Human Systems Technology Research Interests

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Introduction

Draper has a very strong history of human systems technology efforts focused on characterization and quantification of human signals to infer state and intent. We are seeking additional approaches and methodologies for collection and development of quantitative multimodal metrics.

About Draper Laboratory (www.draper.com)

Draper is an independent, not-for-profit corporation, chartered to work on problems in the national interest. Draper is seeking collaborative research partners from universities to further the state of the art in key technologies of mutual interest. Research Whitepapers describing Draper's technology interests and Technical Points of Contact can be found on the Draper Scholars webpage (Draper Scholar Program | Draper). The Draper Scholars Program funds thesis-bearing MS and PhD students at partner universities as one of the effective ways to progress the technology. Other means of collaborative research (e.g. joint proposals, sabbaticals, etc.) are also encouraged. Please contact education@draper.com if you have further questions.

Research Interests

1. ***Robust Metrics***

   Complex human state attributes (e.g., stress, fatigue) can be difficult to quantify robustly and reliably and can vary widely both within and across individuals. We are looking for novel analytic approaches that make use of a variety of multimodal data to generate meaningful and reliable metrics of human state attributes.

2. ***Missing and Messy Data***

   Data from wearable and noncontact sensors can be sparse and/or messy and of poor quality. We are looking for novel approaches to combat these challenges and maximize the information that can be obtained from these signals. Signal process and machine learning approaches are both of interest.

3. ***Novel collection modalities***

   Commercially-available devices (e.g., Fitbit) are commonly used to collect data and make inferences about health and state. We are looking for approaches that leverage these types of devices to collect more nuanced metrics (e.g., beyond gross heart rate) and other types of analogous internet of things devices to understand human state and intent.

We would be targeting PhD students for the development of novel approaches; and MS students for the application of existing approaches to specific problems of interest to Draper.