**Abstract**

Detecting early symptoms of health problems within a spacecraft is both challenging and critically important. Current approaches to comprehensive health monitoring require an array of sensors that are individually prone to malfunction, potentially irreplaceable, and collectively cumbersome to the mobility of astronauts. Blood pressure is one such health index that simply cannot be monitored continuously due to the sensor’s invasive and obstructive nature. These challenges motivate the development of physiological interpolation algorithms that can accurately reconstruct missing or unavailable physiological data with high fidelity using other measures. To address this challenge, we will (1) develop deep learning approaches to enable reliable, real-time reconstruction of missing physiological waveforms using one or more other available waveforms and (2) endeavor to discover the minimal subset of monitoring systems needed to obtain the best overall picture of physiological status. To accomplish these goals, we will build software designed to stream sensor data to a central server where they will train our deep learning algorithms. We will be using this system to aid in collecting training data first from an available data set before moving on to our own research.