

NASA Data Mining Project 2

- a. Scenario: During the heating season in Sustainability Base, cold complaints can become very frequent due to the fact that the building notoriously “runs cold.” Although it has been hypothesized that the “wet bulb globe” sensors which take the weighted mean of dry bulb, mean radiant (black bulb) and wet bulb temperatures which are supposed to more accurately reflect thermal comfort than just dry bulb sensors, it is thought that they are biased high. This hypothesis is being testing by our facilities staff, however, there are alternate hypotheses that can be testing using other relevant subsets of parameters that may influence temperature. The student will work with the application of a variety of standard and novel machine learning approaches to this scenario using an algorithmic pipeline/framework developed at NASA Ames. ACCEPT (Adverse Condition & Critical Event Prediction Toolbox) is an architectural framework designed to compare and contrast the performance of a variety of machine learning and early warning algorithms. We will aim to use ACCEPT to provide advance warning of cold conditions based upon pre-specified parameters, with an aim towards providing facility technicians and operators a decision support tool with which to help facilitate isolating problem areas with the heating system.
- b. Comments: The focus of this effort will relate to adverse event prediction using ACCEPT. Due to be open sourced shortly, this tool will be made publicly available. The ACCEPT framework is written in and operated from within the MATLAB programming and execution environment. As such, the ideal candidate should have a strong background and solid experience with MATLAB, various machine learning algorithms, and early warning/detection techniques (e.g. knowledge of detection schemes based upon Linear Dynamical Systems is a plus).