The student will search for trends in the accelerometer data and use those trends to predict vacuum pump failure. The data was collected at a sample rate of 20 kHz, however due to technical limitations has been Fourier transformed to enable the data to be stored. Practically, this will allow for a device to be made that will be able to warn of pump failures before they occur in mission-critical pump systems. For example, Tempe Town water relies upon the use of vacuum pumps that are the same model as the pumps that will be studied. Preventing unexpected failure of those pumps will allow for the prevention of disruptions in the water supply of Tempe.

By studying these large data sets, the student will learn how to work with large, multivariate data sets. This allows for the student to learn more detailed information about the analysis of data that is encountered in many real applications of statistics.