

Executive Summary

The inability to predict the future is a simple problem that plagues scheduling coordinators. Accurate predictions of hospital admittances and other statistics are invaluable to employers and employees alike. Computer programs known as Time-Series Forecasters (TSFs) are highly effective because they notice complex trends and predict any quantity that varies with time. Generally, TSFs are most effective when applied to massive data sets, often sourced from large companies. Circumventing the need of expansive data is a primary goal of modern data analytics.

I designed one such method to predict the *NEDOC score*¹ of the Presbyterian University Hospital Emergency Department. Since a single hospital provides all the score values, the data set is relatively sparse. This method combines several common forecasting and image processing techniques to train a model with improved accuracy and prediction range. To make a prediction, the trained model analyzes NEDOC data from the past two weeks and uses it to generate a prediction curve for the following day. The model is computationally inexpensive to train and works well on sparse data, making it well suited for various small-scale forecasting applications.

¹ The *NEDOC Score* is a measure of a hospital's emergency department workload. It is based on patient count, admission times, ICU patients, etc.