1.)Introduction/Motivation  
The motivations for our project came from the need to monitor and make predictions about ever increasing amounts of data. Time series data comes in a number of different flavors and formats from temperatures from weather sensors, oxygen and other element concentration levels in mines, traffic wait times in seconds, levels of a particular chemical in blood, and of course financial data from stocks or other sales markets. All these sources require a method of accurately and rapidly detecting patterns and making predictions based on previously observed results. Knowing these values would help us save lives via detection of diseases or prevent the build up of harmful levels of gases within mines. IT also helps us save money by reducing traffic congestion time and prevent wasteful spending within markets or make smarter choices in investment options.   
  
  
5.)Proposed Framework  
The purpose of our project was to implement a prediction method for Time Data that works with live streaming series data. There were four different prediction methods that were attempted, they were the Polynomial Prediction, Linear Prediction, Probabilistic Prediction, and Discrete Fourier Transformation Prediction method which functions on the frequency domain. In the end we choose to pursue the Probabilistic Prediction method as it shows the greatest promise in accuracy and speed of predictions. In order to track and organize our data we used an R-tree indexing system with a height of 7 in order to store our data and reference it. The height of 7 was chosen due to hardware constraints.   
  
6.)Visual Applications  
For ease of interpretation we created and implemented a simple user interface that displayed information such as prediction accuracy, number of nodes, amount of data created, and predicted value.  
  
7.)Experimental Evaluation  
For out experiment we used a weather data from Seattle that was generated over a 24 hour period. However our Algorithm is compatible with all forms of Time Series Data. Existing methods of streaming time series analysis focused on solely on prediction speed while our design focuses on a mix of both speed and accuracy. Other methods of predicting streaming time series tend to have a basis in machine learning algorithms and working with data that as already been generated. To evaluate the effectiveness of our model we compared our predicted values with the actual outcome value. The values we used in our project were the temperature in Seattle in the degrees Celsius. (Screenshot of algorithm)  
  
8.)Future Work  
There are a number of ways to further improve upon our algorithm that we have developed. One of the biggest hurdles towards improving the performance of our project were the hardware requirement, specifically the amount of RAM we need to run the algorithm. To solve this problem we could use a distributed file sharing system in order to share the workload of software and increase the height of our tree. One possible method to accomplish this is through the use of Hadoop. We could implement the software in Java from C++ which may yield some difficulties in transcribing the tree but is possible.   
  
9.)References