



Alcohol Craving and Drinking Prediction Pipeline

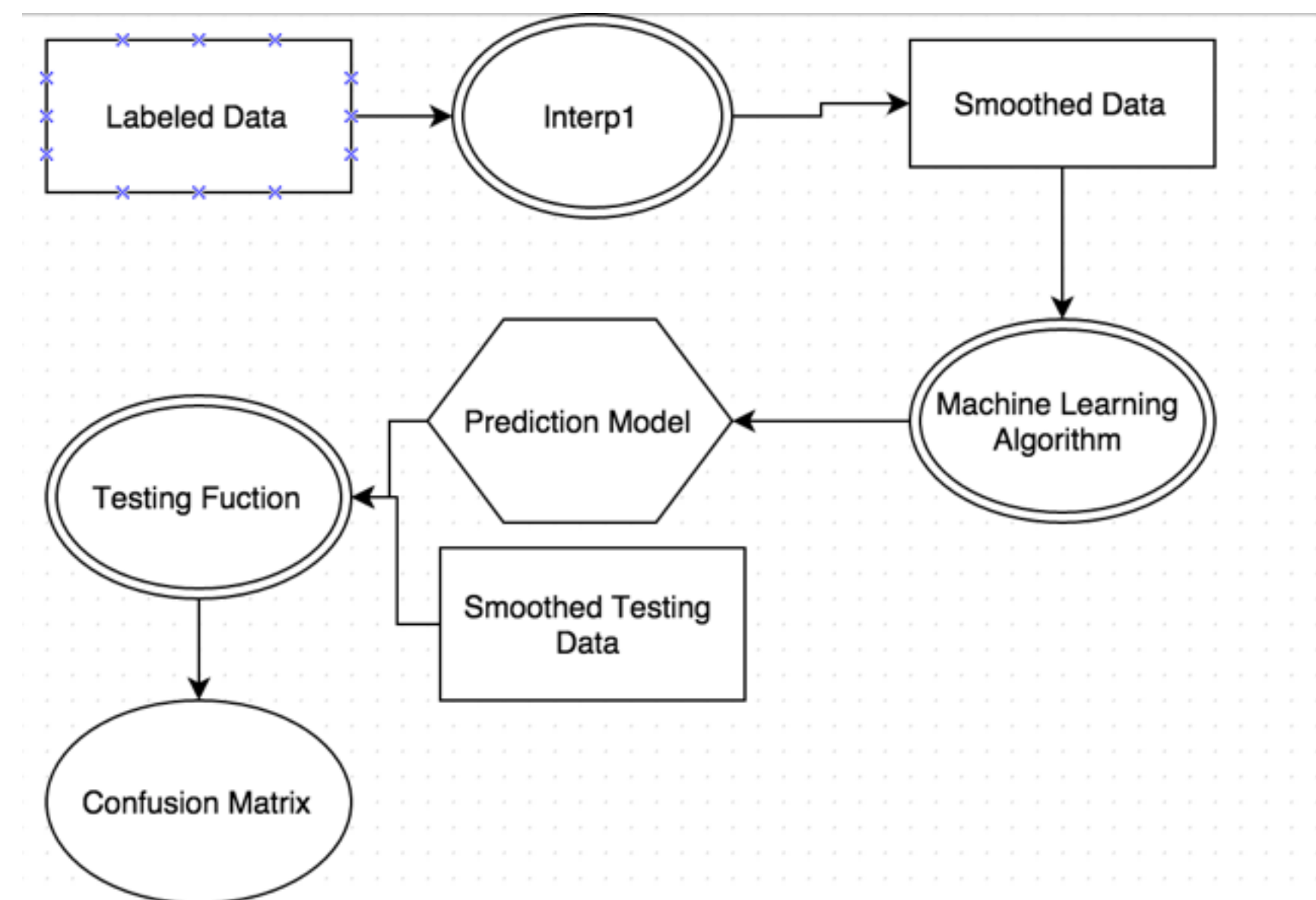
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Problem

This project is to build a machine learning pipeline that takes data and develops a model that is then used to predict when a drink has been made. Once the drink is recognized it notifies a system that will handle the situation by sending a survey to the user of the system.



Procedure

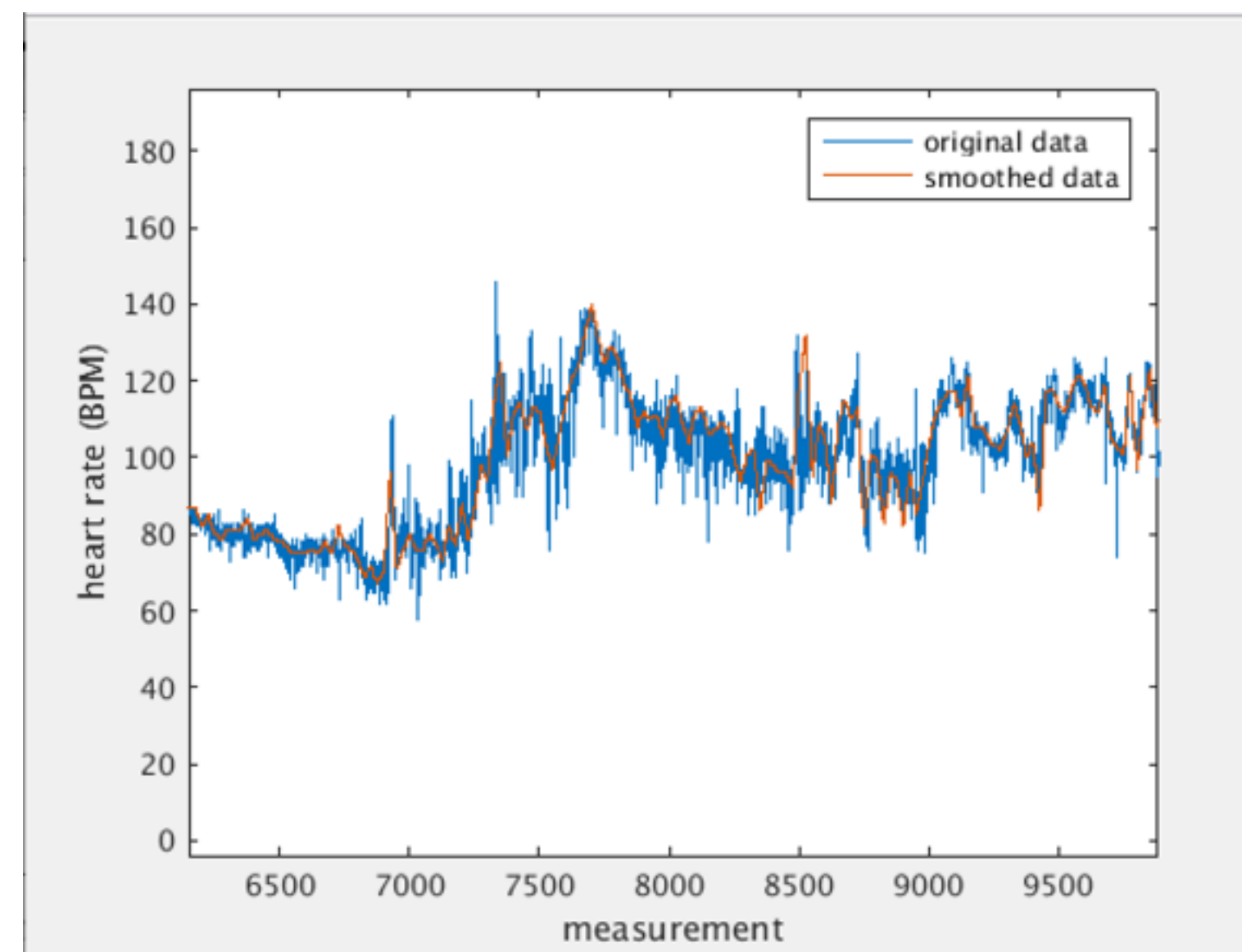
The system starts by collecting the data together and putting it into a filter. The filter removes the outliers of the data. Once the outliers are removed, the pipeline goes into the smoothing phase. During this phase, the noise in the data is removed. Once the noise is removed, the data is then labeled from the survey data within a survey file. The survey data indicates whether or not an individual was drinking alcohol or not. The next step in the pipeline is the training. In this portion a machine learning method is used to develop a model who can predict a drinking or craving episode. Once the model is developed it is then tested on another set of data to see how well it performs.

Motivation

Automated Prediction of drinking alcohol or prediction can lead to very useful technologies. It will allow us to better understand how alcohol affects the body, and it can be used to prevent a relapse during rehabilitation.

Data

The data is collected by a sensory device that records the respiratory rate, the heart rate, the motion of the user, and the skin temperature. Using these attributes the model predicts when they drink.



Contributions

Developed the automation of timeline. The automation runs from input data. It takes the data and runs the entire pipeline labeling, filtering, smoothing, training a model, and testing the model all automatically.

Results

While the current testing results have proved to be promising further testing of the pipeline will be needed. The new pipeline allows for quick testing, as the automated pipeline does everything without the need to manually manipulate the data. Here is a confusion matrix of one of the test cases.

	Negative Prediction	Positive Prediction
Actual Negative	140420	0
Actual Positive	0	360

References

- [1] Ruiqi Shi, Zhang Chen, Haidong Wang, Peng Sun, Timothy Trull, and Yi Shang, "mAAS - A Mobile Ambulatory Assessment System for Alcohol Craving Studies.", Department of Computer Science and Department of Psychological Sciences University of Missouri
- [2] Andrea Mannini and Angelo Maria Sabatini, "Machine Learning Methods for Classifying Human Physical Activity from On-Body Accelerometers" Sensors 2010 ARTS Lab, Scuola Superiore Sant'Anna
- [3] Jang-Han Lee, Ph.D., Hyoseok Kwon, B.A., Joonho Choi, M.D., Ph.D. and Byung-Hwan Yang, M.D., Ph.D., "Cue-Exposure Therapy to Decrease Alcohol Craving in Virtual Environment." CyberPsychology & Behavior. 2007