

Stroke Prediction Capstone Project ISI 490

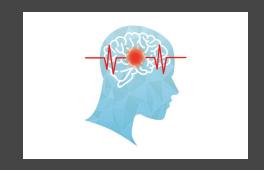
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<u>Introduction</u>



- •A stroke occurs when the blood supply to part of your brain is interrupted or reduced, preventing brain tissue from getting oxygen and nutrients. Due to this the brain cells begin to die out within minutes.
- •A stroke is a medical emergency, and prompt treatment is crucial. Early action can reduce brain damage and other complications.
- \circ According to the World Health Organization (WHO) stroke is the 2nd leading cause of death globally, responsible for approximately 11% of total deaths.
- •One of the factors that greatly contribute to a stroke is having a high Body Mass Index (BMI).
- •Individuals who are able to recognize symptoms of having a stroke have the ability to change their habits and thus prevent a stroke from occurring. This is the ultimate goal of the project; to assist those who are likely to have a stroke by developing a prediction analysis to further improve their healthier lifestyle(s).

Project Scope

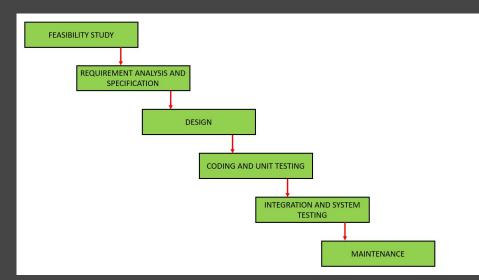


- Allow users to create an account and login to their account.
- Allow users to input their information to be able to predict if user is vulnerable to a stroke or not.
- Grants user the ability to redisplay their latest stroke prediction and save their stroke predictions history within a database to be displayed for future purposes.
- Provide user with helpful resources regardless if algorithm predicts stroke or no stroke.
- Grant users permission to delete their account and personalizing it by adding their own profile picture to be displayed.

<u>Software Process Model</u>

This project follows a traditional waterfall model. Prior to starting the project, we collected requirements to decide what we would want to accomplish with an idea of a Stroke Prediction. We followed this up with the design and the coding of the project, while receiving feedback to update the project as necessary. Due to this we were able to design a project that met our requirements.

The Waterfall Method



Tools and Technologies

Software:

- Figma
- Visual Studio
- Google Docs Editors
- Microsoft Office Suite

Technologies:

- Python
- SQLAlchemy
- HTML

Libraries:

- Flask
- Httplib2
- Joblip2
- Numpy
- Pandas
- Requests
- Scikit_learn
- Flask-SQLAlchemy

Machine Learning Algorithm:

Random Forest
Classification

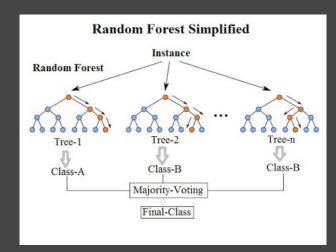


How Does the Algorithm Work?

For this current prediction method we are utilizing Random Forest Classification (RFC) with a rating of 95.07%. We begun by importing our train_test_split, before introducing feature scaling - standard scaler. We continued by training the RFC model, and finally applying confusion matrix interval to achieve a total rating of 0.95070422...

After applying k-Fold Cross Validation, the original accuracy rating of 94.89% with a Standard Deviation of 0.27%.

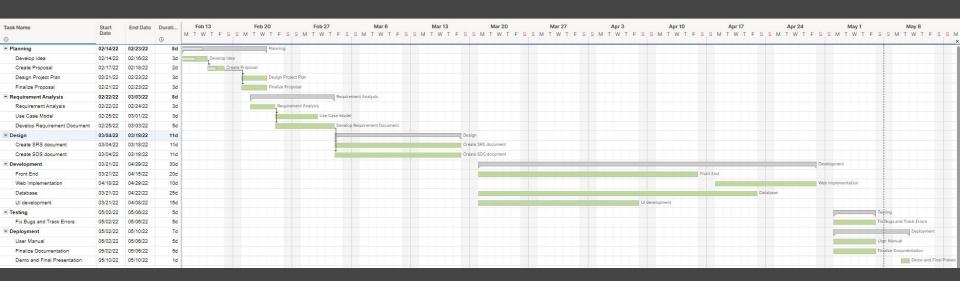
When the user inputs their information, their data is compared with an existing dataset of patients who have had a stroke and have not had a stroke based on the provided information. Based on this the class groups gather and predict the majority voting.



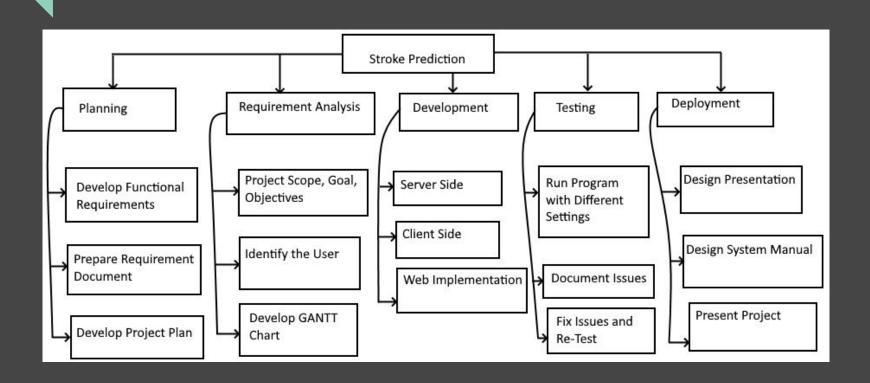
Requirement Specification

- Register new user account the first time the user accesses the system, they are required to create a new account. Credentials include a username, first and last name, as well as a password.
- Login login to the system with newly created credentials to verify the user.
- Fill in information the user will fill in their information including BMI, job type, age, gender, etc.
- Receive stroke prediction once the user fills out their information, they can submit the form, the system calculates if the user would have a stroke, and display the results to the user.

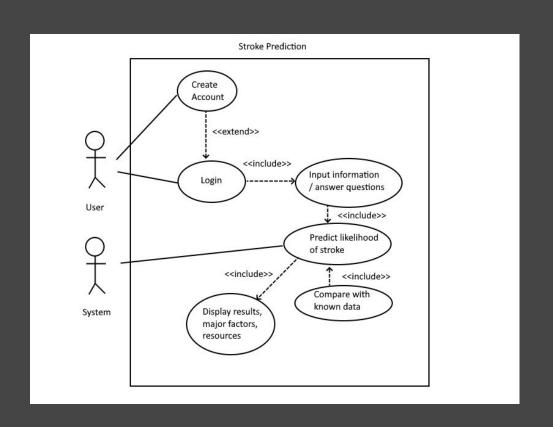
GANTT Chart



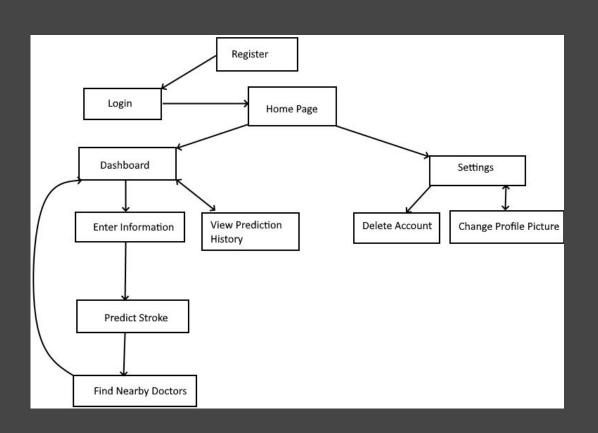
Work Breakdown Structure



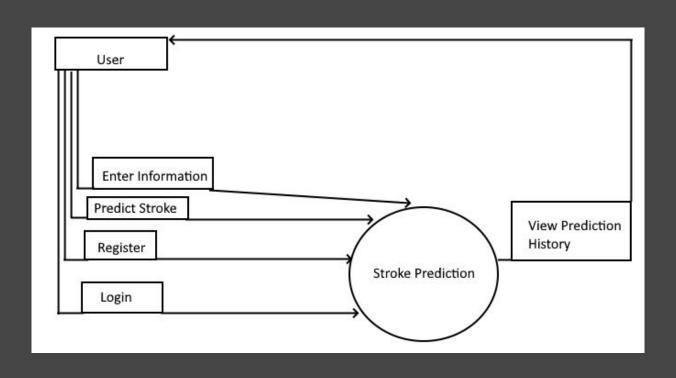
Use Case Diagram



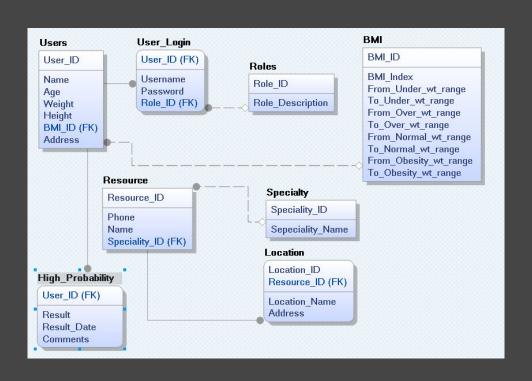
Process Flow Diagram



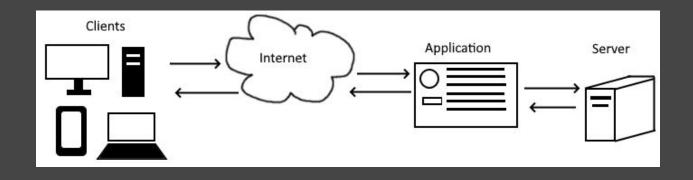
Class Diagram



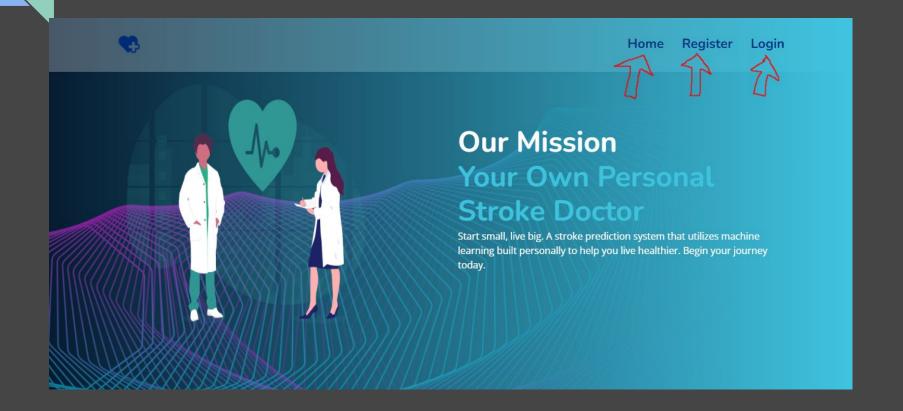
Entity Relationship Diagram



Software Architecture



Landing Page 1/3



Landing Page 2/3



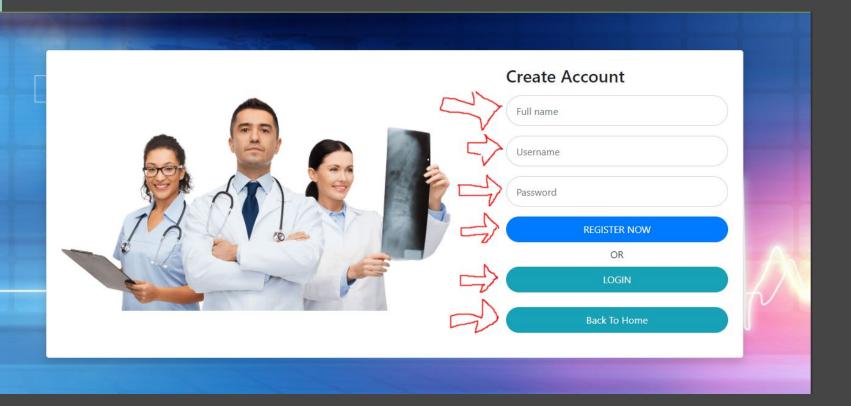


Dont wait until it's too late, begin your steps to a healthier journey today.

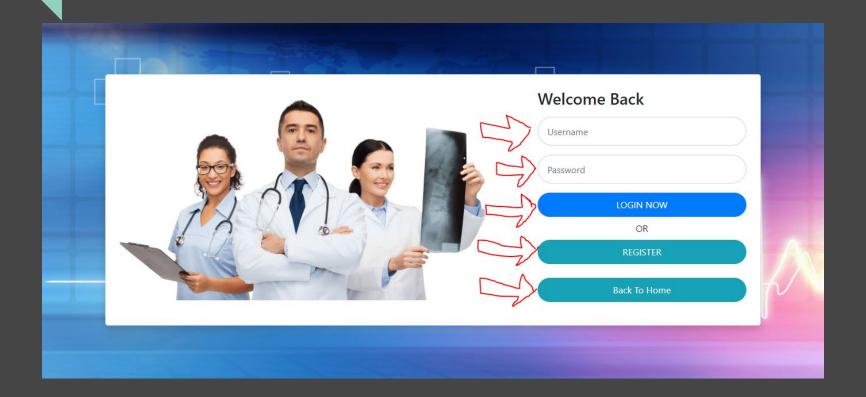
Landing Page 3/3



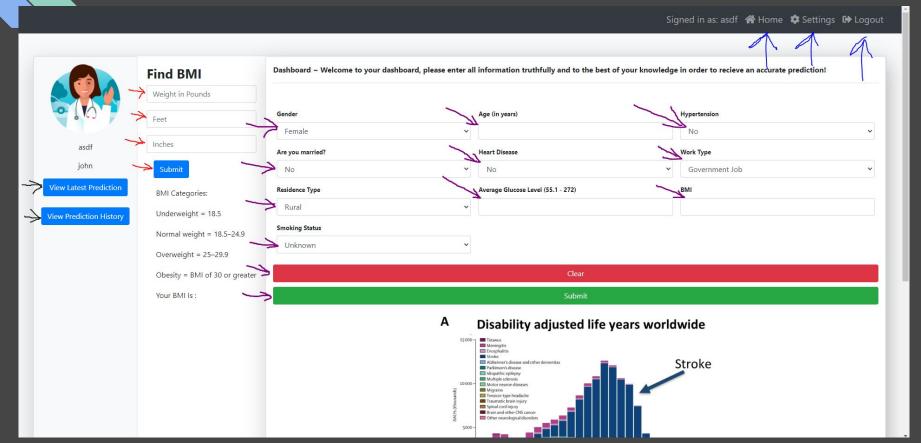
Registration Page



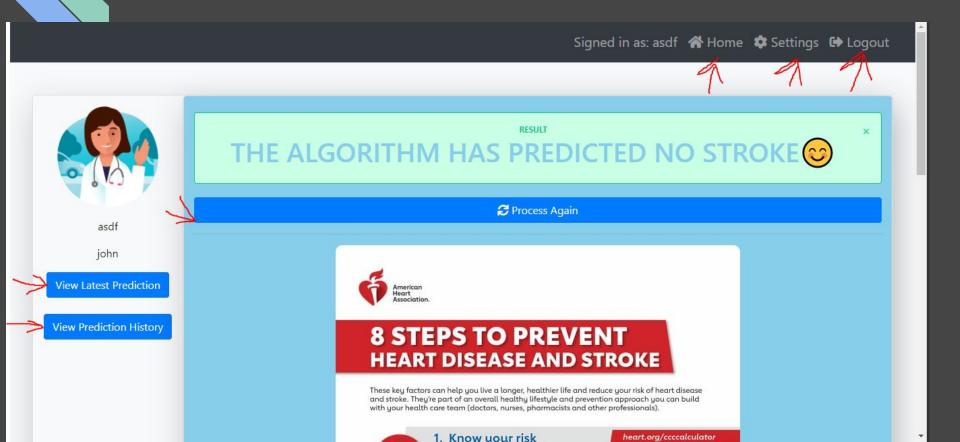
Login Page



Home Page



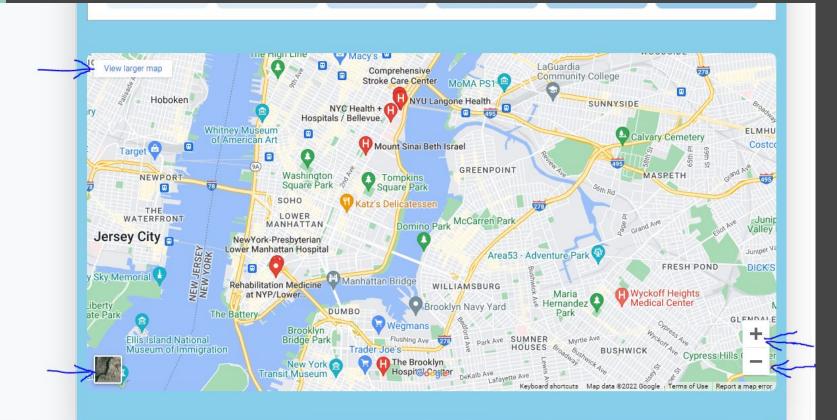
Predicted No Stroke



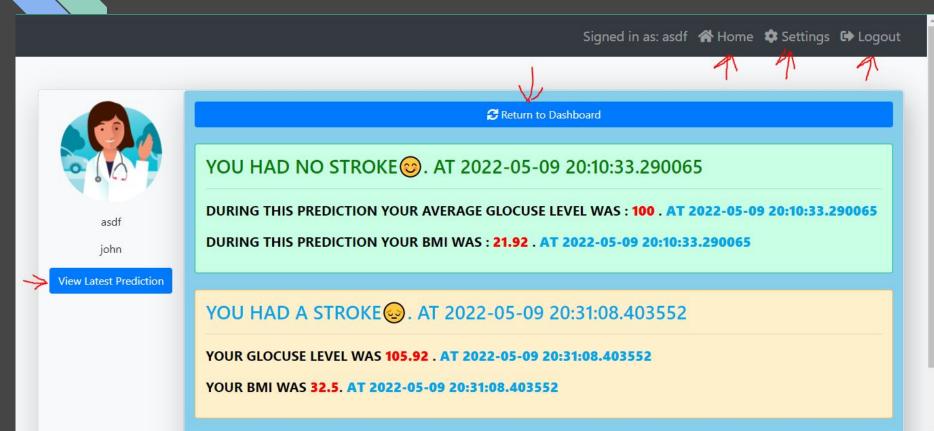
Predicted Stroke 1/2



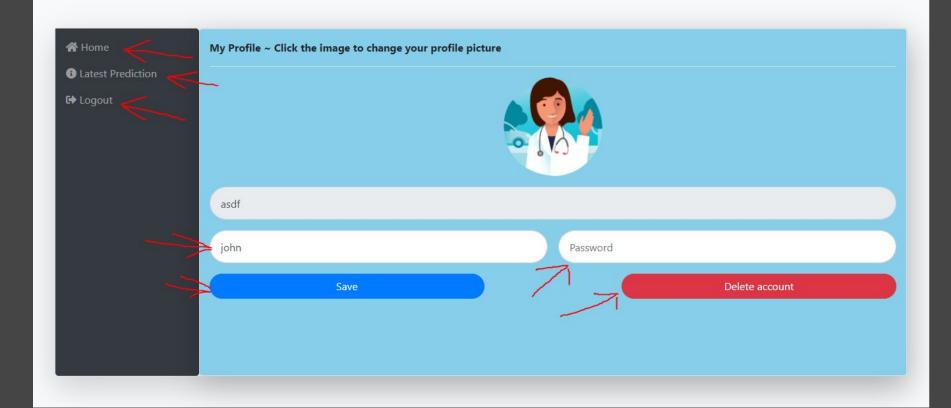
Predicted Stroke 2/2



Stroke Prediction History



Settings



<u>Live Demo</u>

