

# Practicum Sprint #4

## Mental/Physical Illness Chatbot

Tusheet Goli, Tejas Pradeep, Akshay Sathiya, Pranav Khorana, Sanket Manjesh,  
Rahul Chawla

[tgoli3@gatech.edu](mailto:tgoli3@gatech.edu), [tpradeep8@gatech.edu](mailto:tpradeep8@gatech.edu), [asathiya6@gatech.edu](mailto:asathiya6@gatech.edu),  
[pkhorana3@gatech.edu](mailto:pkhorana3@gatech.edu), [smanjesh3@gatech.edu](mailto:smanjesh3@gatech.edu), [rchawla36@gatech.edu](mailto:rchawla36@gatech.edu)

### 1 ACCOMPLISHMENTS THIS WEEK

#### 1.1 Akshay Sathiya's Progress

This week, Akshay worked on the second task and the third task listed in the Practicum Sprint #2 submission (splitting training/testing data and building ML models, respectively) for the physical diseases dataset (Patil, 2020). Akshay wrote Python and Scikit-learn code to standard scale the data and use it to train the physical illness prediction (PIP) models (a random forest classifier and a neural network (multi-layer perceptron) classifier). The trained random forest has a 93.72% train accuracy and a 90.96% test accuracy. The trained neural network has a 91.90% train accuracy and a 91.57% test accuracy. Each model is saved to a file (as a pipeline that includes the standard scaler and the model itself) for future use.

Akshay will continue working on these ML models in the next sprint, specifically writing code to evaluate them further with other metrics like F1 score/K-fold cross validation and writing code to prepare the inputs (extract symptom information from text, construct feature vectors) and process the outputs (express physical illness risks from class probability outputs in a simple and understandable form) of these ML models.

Akshay has pushed his code and the saved model files to the GitHub repository, and merged his work with the *master* branch.

#### 1.2 Pranav Khorana's Progress

This week, Pranav continued to work on the front end for the application by getting started on designing the login page and the profile page. He is

considering integrating Firebase Authentication with the application for users to easily register themselves and create profiles.

### **1.3 Rahul Chawla's Progress**

This week, Rahul continued to work on the Heroku Postgre SQL database from last week. He began designing schemas on the database in order to properly store the data from the application. While creating the designs, Rahul kept in mind proper SQL principles such as reference integrity, and reasonable key identifiers. Furthermore, Rahul used this information to instantiate tables on the database. Going forward, Rahul will work with other team members to integrate it with the backend and determine what new tables need to be created.

### **1.4 Tusheet Goli's Progress**

This week, Tusheet continued working on setting up the core backend features and the API structure from last week. He helped make several individual services into their own docker containerized environments. He added on to last week's work by designing the individual databases for each of these services and developed a proper database design schema for all these individual but interacting services. These PostgreSQL databases are hosted on the Heroku application page for the respective services. Thus, this design of the databases was one of the main tasks Tusheet worked on this week. He also performed some basic testing on these databases to ensure they function as intended. In addition to this, he worked along with Tejas to develop the API endpoints for these respective services to properly determine how these services are going to interact with each other and use which endpoints. More about this is mentioned in Tejas' progress. Tusheet's work contributes to the development of a robust cloud-hosted backend with individual scalable docker containerized environments deployed on Heroku. These are the foundational aspects of the app and we will add more features to this core backend structure.

### **1.5 Tejas Pradeep's Progress**

This week Tejas continues to work on the backend design from last week. Since the backend is heavily reliant on other tasks, having a more robust design. This week Tejas worked on creating UML diagrams to assist with backend planning and development. Further having a UML diagram for the backend shall assist in further developing of other features such as the server and the database as the

backend shall be the main point of communication between the various aspects of the system. Further Tejas also worked on starting to flush out details.

### **1.6 Sanket Manjesh's Progress**

Sanket decided to switch from Node.js to Flask as the primary library with which to write the backend server with. The primary reason this switch was made is that the project's ML models will be created in Python, meaning that creating the backend server using Python Flask will make it easier to integrate with our ML models to obtain results from and send between the front-end and database. Now, Sanket's next steps are to connect the Flask server to the React Native front-end up, which might be a little more complicated since the front-end is written in JS while the backend is written in Python.

## **2 CHALLENGES ENCOUNTERED**

### **2.1 Sanket Manjesh's Challenges**

Sanket is away for Spring Break from Saturday through Thursday but will make sure to work on his part further when he returns.

### **2.2 Tejas Pradeep's Challenges**

This week Tejas was quite swamped with many assignments and fell ill from Monday to Friday reducing the amount of work he could have done. He shall make up for the lost work the week after spring break.

### **2.3 Tusheet Goli's Challenges**

Tusheet left from spring break on Friday and as a result, only worked on this between Monday and Thursday. He also won't be available to work on this during spring break. But he plans on stepping up the pace and getting more done after spring break to make up for this lost time.

### **2.4 Pranav Khorana's Challenges**

Pranav had many assignments over this past week, so he wasn't able to complete much work over this past week. He should have time to make progress on his tasks over this coming week.

### 3 FUTURE PLANS

The team made progress in setting up the foundational software architecture for the application, setting up the other services we planned on using, and building the machine learning components of the project. We are on track as per the plans on our Project Proposal document. We are hence going as per schedule and will continue working on our tasks based on the proposed schedule.

### 4 REFERENCES

1. Patil, P. (2020, May 24). *Disease Symptom Prediction*. Kaggle. Retrieved March 6, 2022, from <https://www.kaggle.com/itachi9604/disease-symptom-description-dataset>