

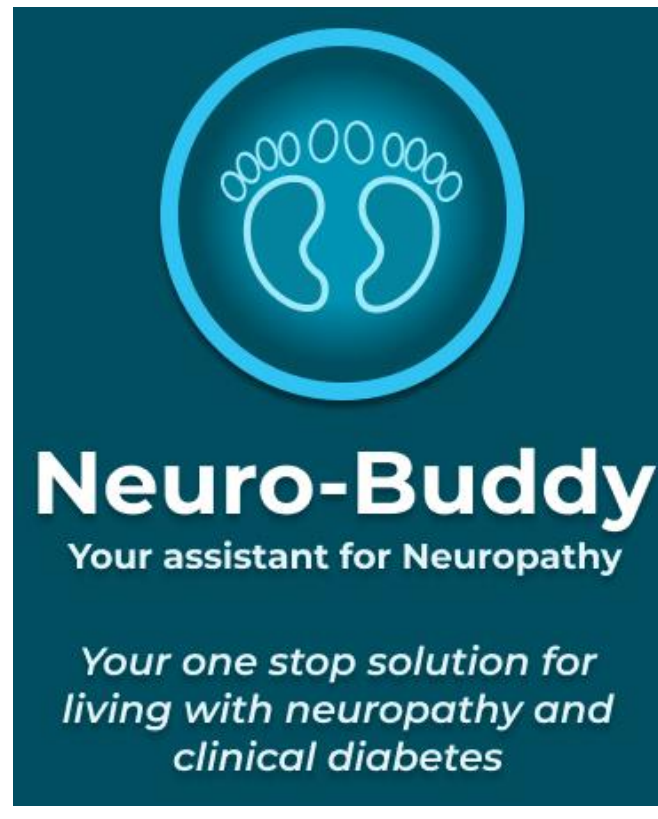
STUDENTS: AJ CHAU, CHRIS PHAN, KUSHAGRA BHATIA, RAMYA BHAGIRATHI SUBRAMANIAN

PROBLEM STATEMENT

Diabetic Neuropathy patients experience limitations such as:

- Pain in their limbs
- Numbness
- Increased sensitivity to touch
- Hypoglycemia unawareness
- Drastic Mood changes

They require support to keep track of their health and provide them with a buddy who can assist them in their daily activities.



SCAN TO INTERACT WITH THE PROTOTYPE!

OUR SOLUTION

- Develop a personalized tracking/recommendation tool for diabetic neuropathy patients to manage their condition.
- Track Activity, Medicine, Blood Sugar, Mood and List of Tasks that the patient must perform to remain healthy.
- Pain relief in the hands and feet through interactive instructions.
- Suggestions to uplift mood through Machine Learning algorithmically personalized to each user.
- The solution has high level UX standards and provides an easy-to-use UI for patients in all age groups.

OUR PROCESS

- We followed the UX Development process. (Fig.2)
- We began with requirements engineering.
- We researched via interviews.
- We empathized with the users, through user personas and storyboarding (Fig.3)
- The learnings from these steps was employed in the design and user testing iteratively.
- Since usability was a major criteria to design and develop this app, we ensured that we created the designs based on user feedback.

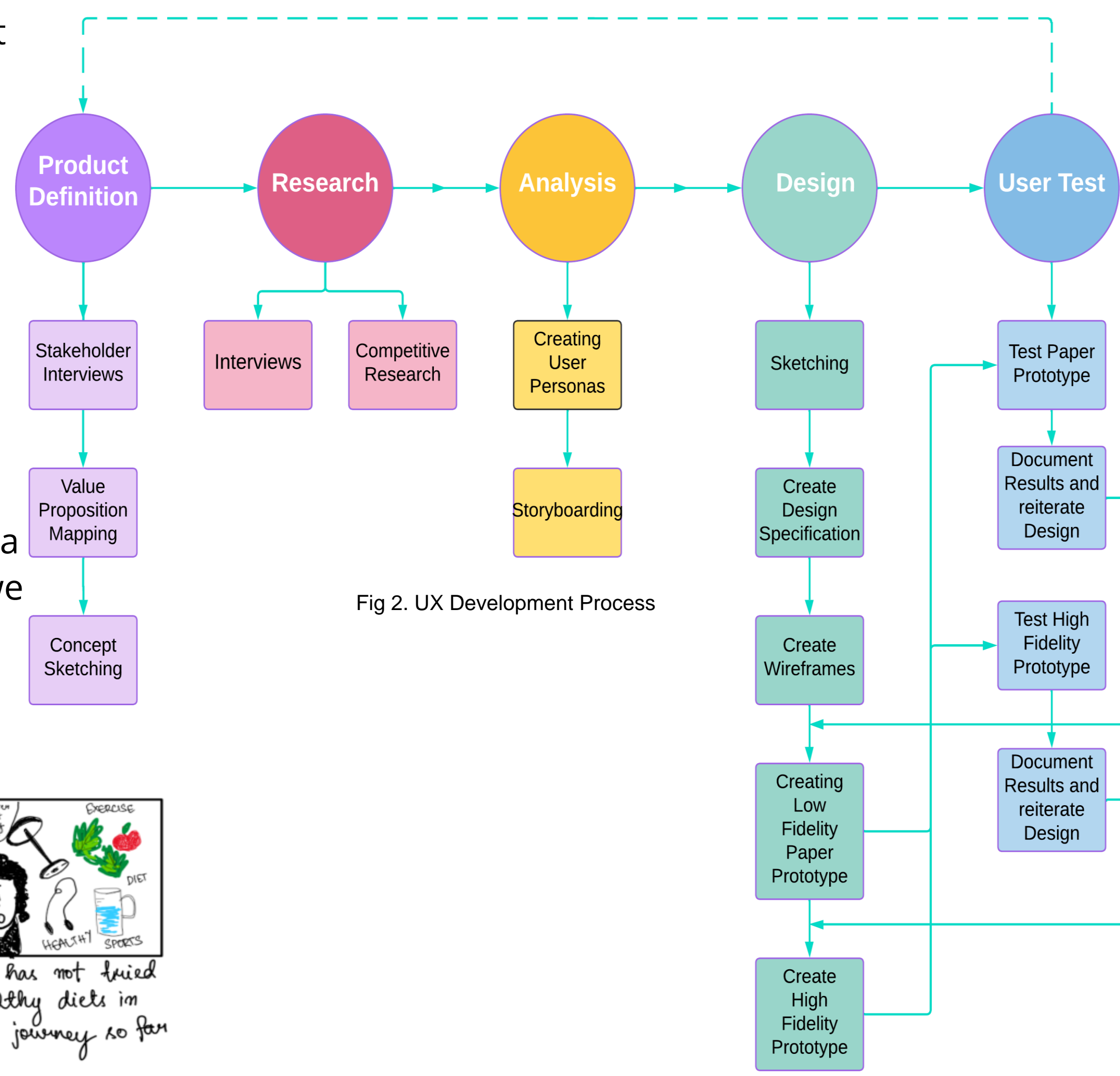


Fig 2. UX Development Process

Fig 3. Storyboard



TOOLS AND TECHNOLOGIES

Design: Figma, LucidChart, Miro, Drawio [1-4]
Technologies: React Native, React Navigation, Firebase, MongoDB, Express, Node.js, TensorFlow, Expo, Anima [5-12]



Fig 1. High Fidelity Prototype of the Neuro Buddy App; (L-R) Home Screen, Mood Board, Blood Sugar Journal, User Progress

FEATURES

- The Home screen provides the user with a comprehensive dashboard where the user can track their diet, workout, and blood sugar levels. (Fig.1)
- The Mood Board allows the user to track their mood on a monthly basis by color codes and provides suggestions by using BERT Model. (Fig.1)
- The Blood Sugar Journal provides the user with a graphical interactive interface to track their blood sugar levels daily. (Fig.1)
- The Neuro Sense feature provides the user with exercises to relieve pain in the limbs. (Fig.5)
- The users will be able to enter their mood, health data and their to-do lists. The app acts as a buddy and helps them plan their day and track their health by providing suggestions based on the user inputs.
- We used Node.js, Express, Firebase and MongoDB for the Back-End since they had good community support along with high ease in the integration with React Native. (Fig.4)

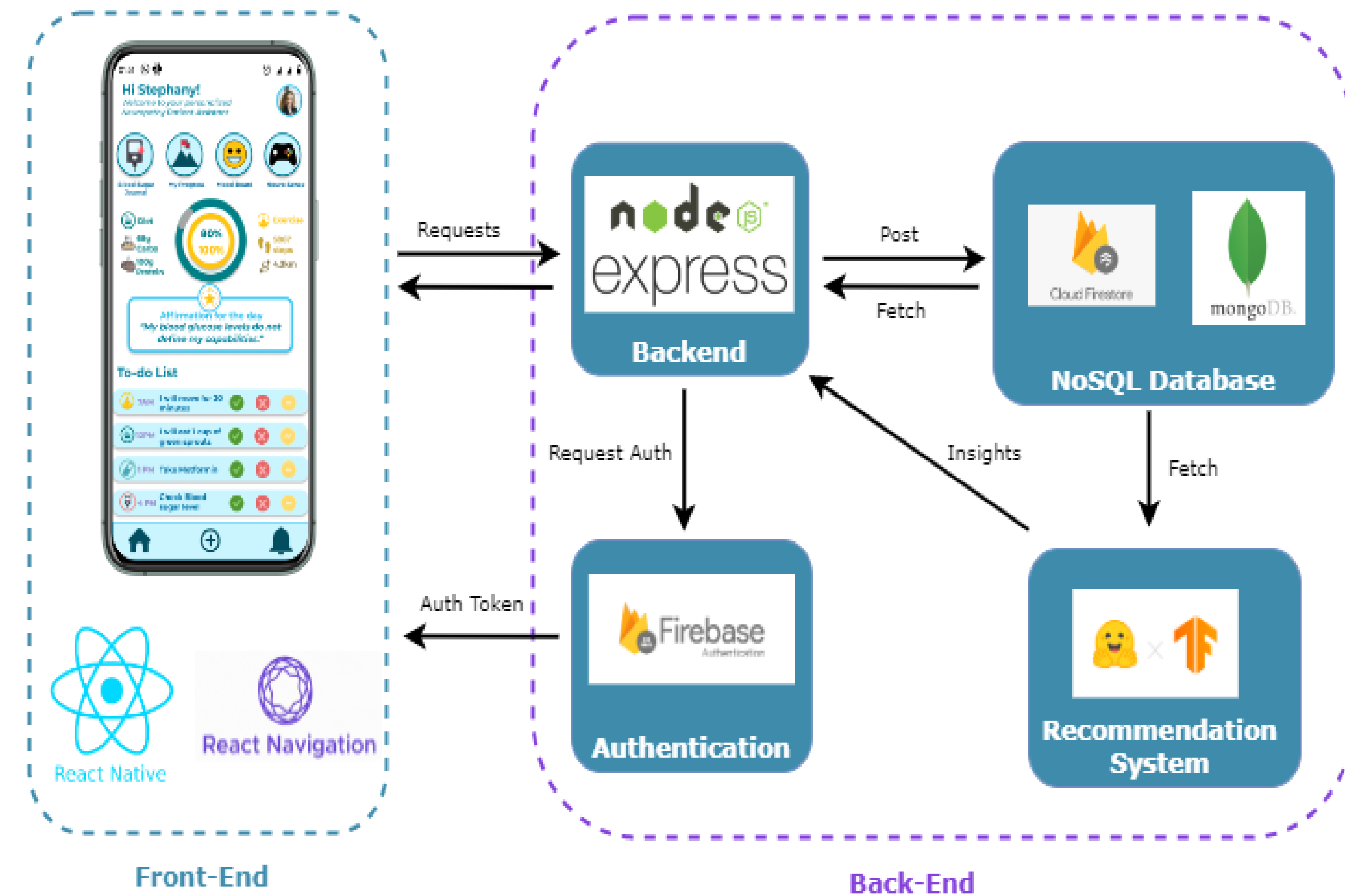


Fig 4. System Diagram displaying the working of the App.

FUTURE WORK

- Improve visual aspect of the app by incorporating more user intuitive elements.
- Provide push notifications to Smart devices to remind users of their tasks.
- Improve predictions by augmenting the Machine learning model.
- Integration with Smart devices such as Apple Watch, Alexa, Google Home. (Fig.6)

REFERENCES

- [1]: <https://www.figma.com/>
- [2]: <https://www.lucidchart.com/pages/>
- [3]: <https://miro.com/index/>
- [4]: <https://drawio-app.com/>
- [5]: <https://reactnative.dev/>
- [6]: <https://reactnavigation.org/>
- [7]: <https://firebase.google.com/>
- [8]: <https://www.mongodb.com/>
- [9]: <https://nodejs.org/en/about/>
- [10]: <https://www.tensorflow.org/>
- [11]: <https://expo.dev/>
- [12]: <https://www.animaapp.com/>
- [13]: https://developer.apple.com/design/human-interface-guidelines/ios/overview/themes/#/apple_ref/doc/uid/TP40006556
- [14]: <https://developer.apple.com/app-store/review/guidelines/>
- [15]: MIT License has been added to the github repositories: <https://github.com/kush1198/neuro-assistant-react> (Front-End) <https://github.com/kush1198/neuro-assistant-backend> (Back-End)



Fig 6. High Fidelity Prototype of Apple Watch Interface

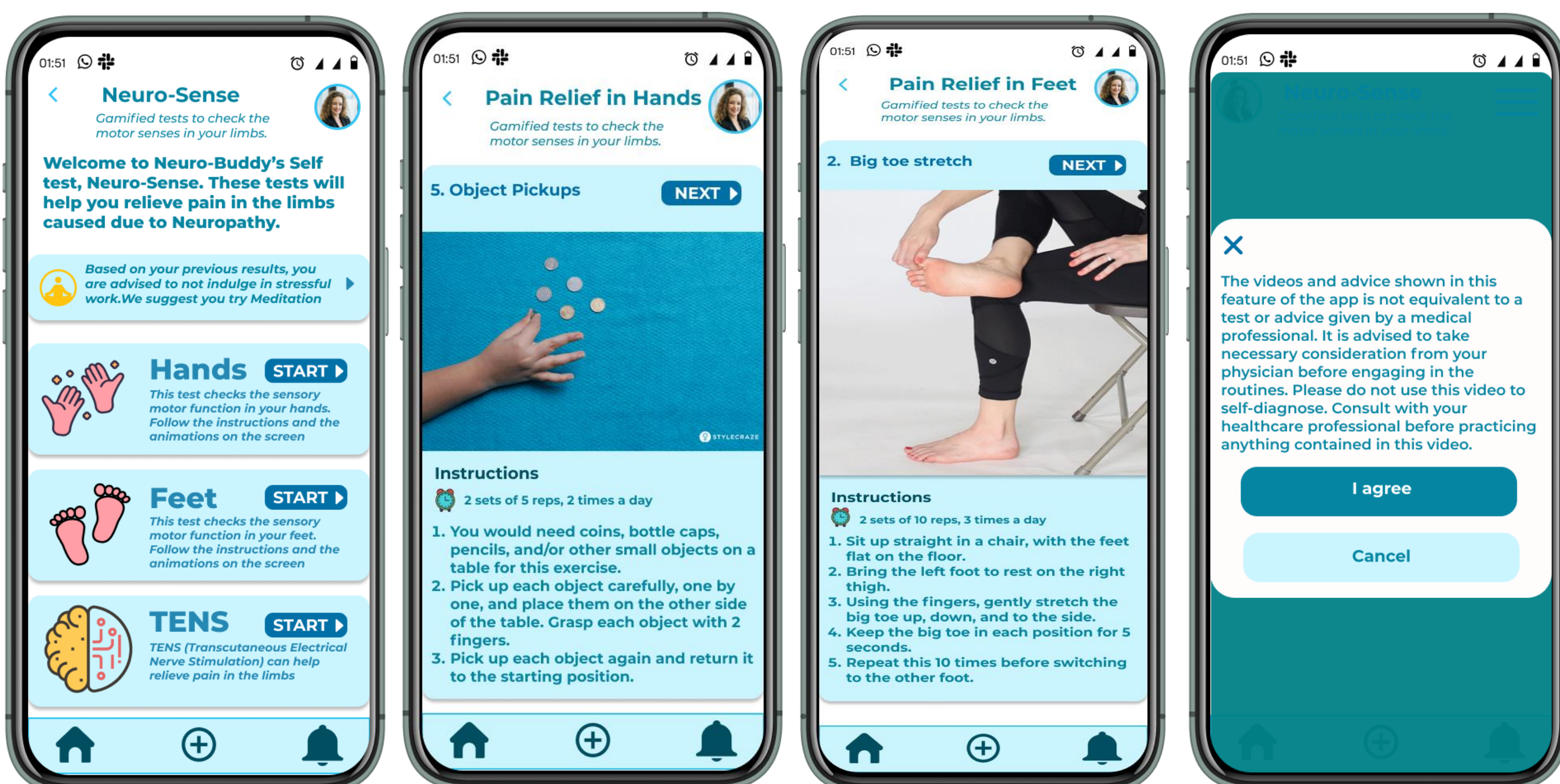


Fig 5. High Fidelity Prototype of the Neuro Buddy App; (L-R) Neuro Sense feature, Pain relief exercises in Hands, Feet, Warning notification for users