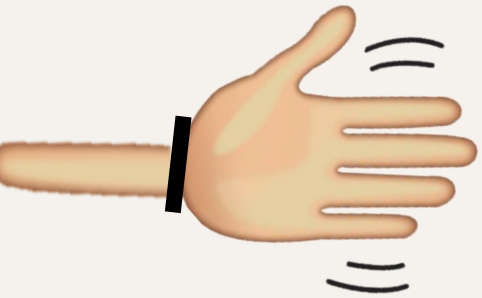# S T A Y B L E
S t a y   S t a b l e

Tangible interfaces workshop

Mentors: Michal Brill Glasner and Benny Shapira

Project members: Matan Bakva, Gal Kontente, Lior Hai

Gadi

- Gadi was diagnosed with Parkinson's disease very recently and is dedicated to managing his condition

- He wants to keep his lifestyle as similar as possible to what he had before

- The doctor gave him medicine to stop the tremors, but Gadi needs to figure out what the right dose is for him by experimenting with different doses

- He struggles with keeping up of his dosage

- He feels a lack of confidence regarding his walking and is scared of falling down
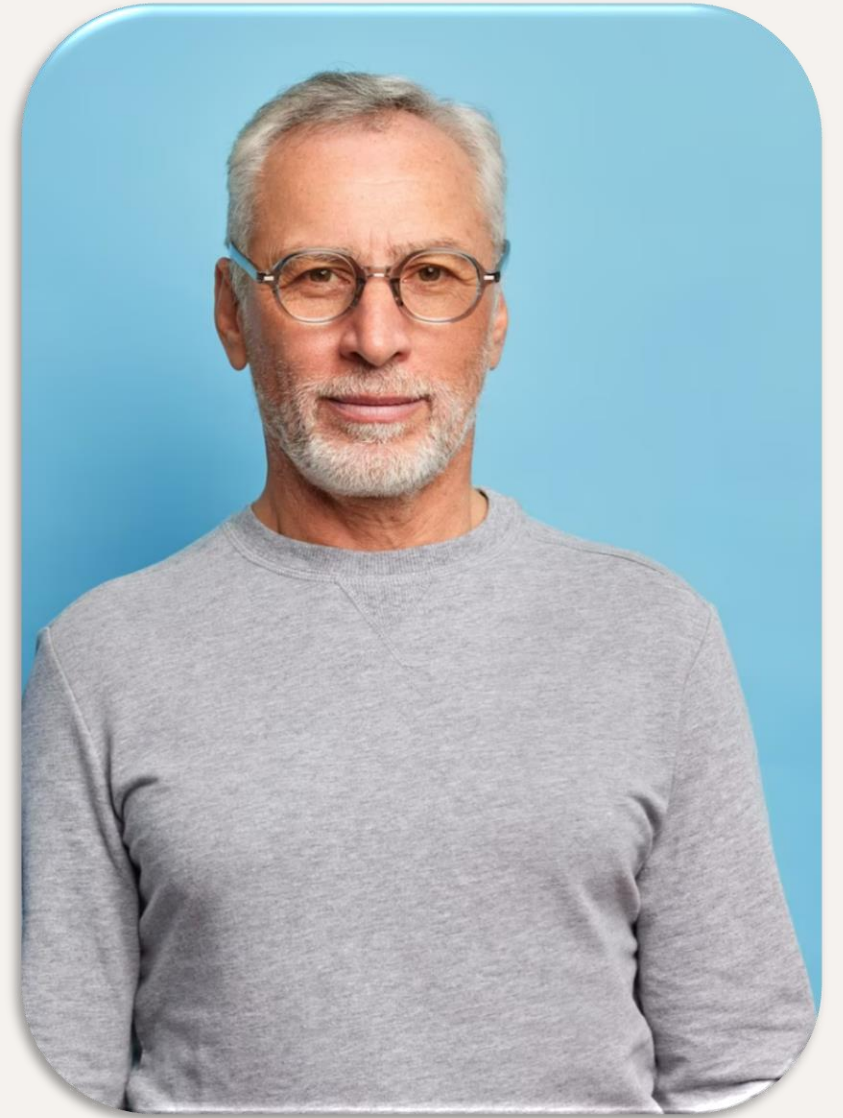
Mika

- Mika is the primary caregiver of David. Her main job is to help him on his day to day activities while helping him control his Parkinson

- She wants to help him as much as she can and to know he is safe

- She doesn't feel what David feels so its hard for her to decide what is the right dose for him

- She is anxious when she is away from him because he might fall

Our solution

The app was designed for Parkinson's patients in the early stages of their disease and their caregivers for when the patients can not use their phone by themselves.

✓ Monitors taking a drug that contains the substance levodopa that stops the tremors of Parkinson's patients with the help of an application feed

✓ Presents data analysis so that the drug dosage can be adjusted

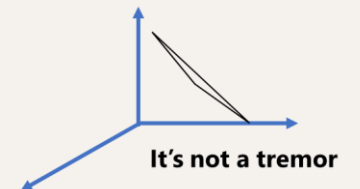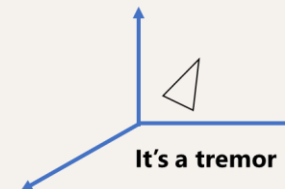✓ Detects a fall and sends an alert to up to 3 selected people

The Algorithm

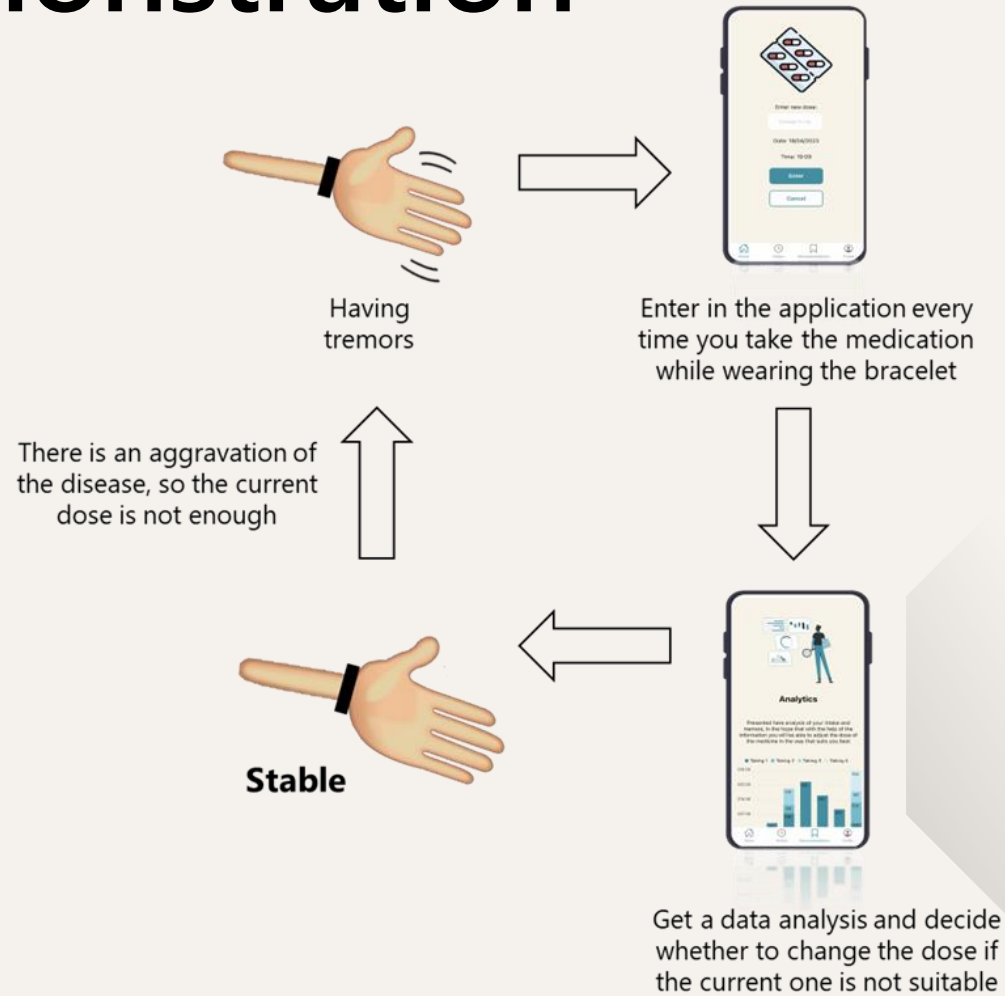**Studies show that the average speed of hand tremors in Parkinson's patients is 4-6 Hz.**

Using the acceleration component in the bracelet we extract points in the form of (x,y,z).

There will be 2 pairs of points (x1,y1,z1), (x2,y2,z2) and (x3,y3,z3), (x4,y4,z4):

- If (x2,y2,z2) != (x3,y3,z3) then:
    - If the speed between them If the speed is between 4 - 6 Hz **it's a tremor**, Else **it's not a tremor**

- If (x2,y2,z2) == (x3,y3,z3) then:
    - We create a triangle from points 1, 2 and 4 and check whether it has an angle that is close to 180 degrees
    - If there isn't- **it's a tremor** Else if there is- **it's not a tremor**

It's a tremor

It's not a tremor

Demonstration

Architecture of the solution

Measuring vibrations and detecting falls

The python server is stored in amazon server

Server and database: stores users information and performing data analysis

In the app, the user enters the intake and receives the data analysis

The SQLite database in phpMyAdmin server
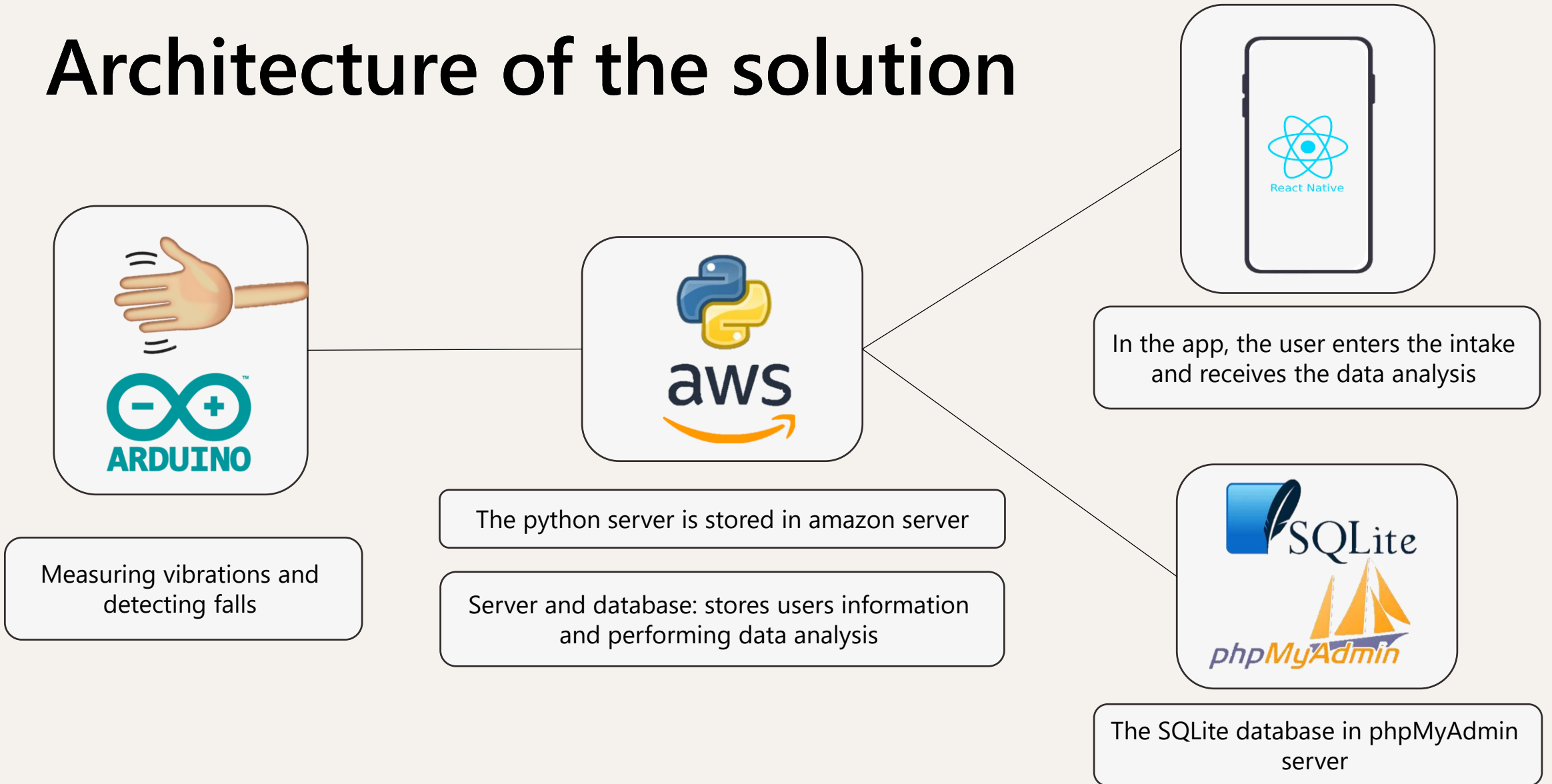
What is available today?

Apda symptoms tracker
An app that helps you manage you Parkinson's symptoms by filling out questionnaires, from those you can gain insights on how to further your self treatment. In my opinion **it makes the user do a lot of work to get important insights.**

BEATS medical
an app that supports Parkinson's patients by giving them physical therapy exercises that help them improve their mobility. Very useful for Parkinson's patients but **it doesn't achieve what we do.**

My therapy
an app that helps you manage your disease. The app helps you keep notes regarding you disease that you can than show your caregiving team. It helps monitor the progression of your disease. **Does what it says, but it is not adjusted for Parkinson's.**

Project summary and conclusions

The development of this app and bracelet represents a significant step forward in the stabling and care of individuals living with Parkinson's disease.

By combining medication monitoring, data analysis, and fall detection, we offer a comprehensive solution that promotes patient well-being, medication optimization, and safety.

The project's success highlights the potential of technology to positively impact the lives of those affected by Parkinson's disease and paves the way for further advancements in the field of healthcare.

Sometimes problems that are part of everyday life can be solved with the help of available technological methods.

The quality of life of Parkinson's patients who belong to a generation that doesn't have good technical skills can improve dramatically if we give them the opportunity to try advanced solutions.