

Applications of Biometric Wearable Devices in Preclinical Lab Spaces

The Data Mine and Merck Corporate Partnership

Introduction

- Merck is a pharmaceutical company focused on using the power of leading-edge science to save and improve lives around the world
- In research lab environments, scientists endure large amounts of mental and physical stress while performing their research and associated experiments
- Scientists generally enter the lab space with a Standard Operating Procedure (SOP) that they will follow
- To alleviate some of that stress, we have developed a web application for researchers to utilize while experimenting
- Developed a pipeline for biometric data acquisition of researchers during their lab experiments

Full Stack

Back End

- Created APIs to read and/or write to and from the database and web application
- Worked with Python, Flask, and GraphQL to connect Front End's User Interface with the team's database

Front End

- Designed and built the User Interface for the experimental assistant
- Created a system to step through experimental instruction sets and record readings
- Added speech input capabilities to control basic experimental commands

Data Engineering/Architecture

- The main goal of the data engineering group was data acquisition.
- Data acquisition process includes pulling biometric data from the Garmin watches.
- Used the GarminConnect python API wrapper and Python script to collect and store the data.
- The data collected was stored in AWS RDS
- The schema of the RDS was designed to hold biometric data, Standard Operating Procedure, and experimental data.

Figure 1: Create New Experiment Page

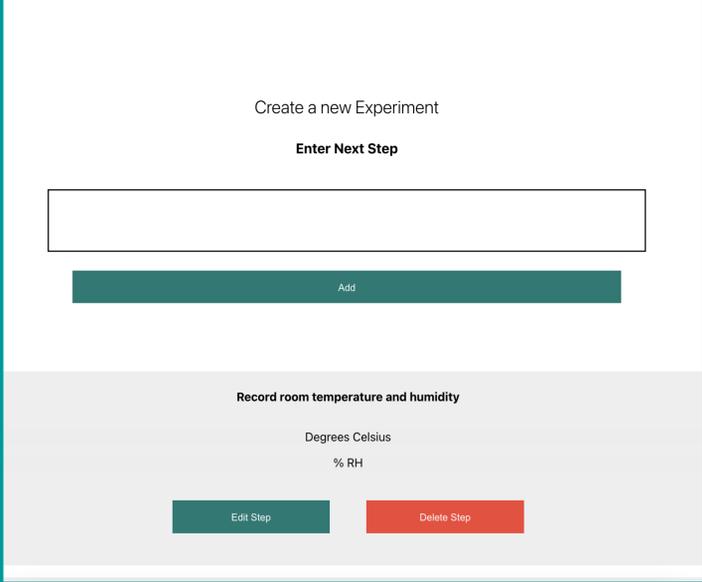
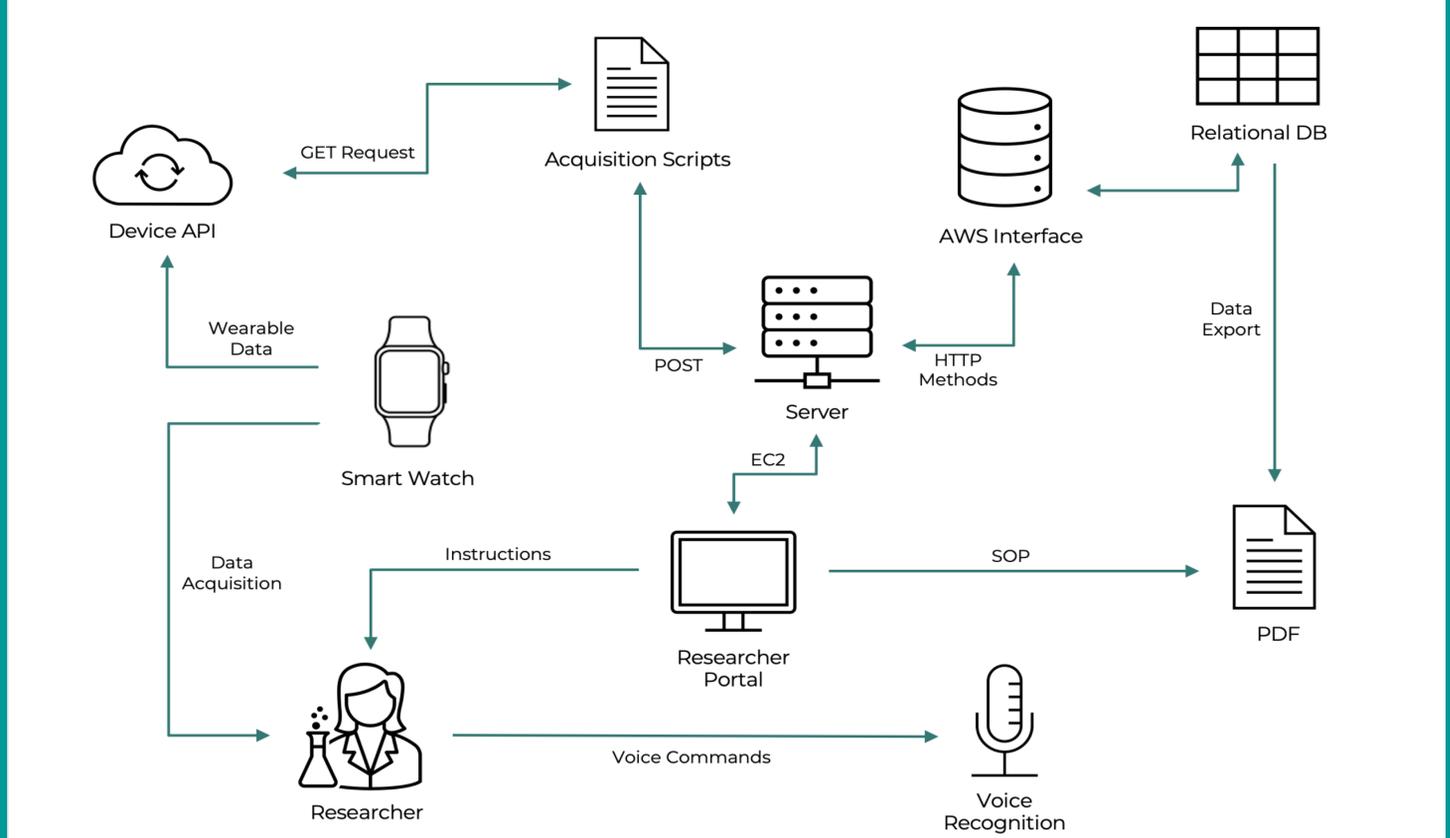


Figure 2: Product Workflow



Conclusion and Future Goals

- Our research will help streamline standard operating procedures in the lab space.
- In the future, we will implement new features to the web app that allow for speech to text
- Improved data acquisition functionality including compatibility with Fitbit and Apple watches

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