Orbio – Biometrics made easy

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1 Introduction

Our web application streamlines research studies involving real-time biometric data collected from smartwatches. Powered by CLAID1 - ETH Zurich's cutting-edge "Edge AI Integration and Sensor Data Collection" platform, developed at the ADAMMA lab — our solution simplifies watch setup, study management, and the processing and visualization of biometric data. It empowers Principal Investigators (PIs) and users to effortlessly track study progress and visualize data in real time.

2 Problem Statement

Research studies involving biometric data from smartwatches often suffer from fragmented workflows and inefficient management. Principal Investigators (PIs) struggle to ensure consistent data collection, as gaps in data can go unnoticed, compromising research integrity. Existing platforms lack a centralized solution, making it difficult for PIs to monitor and control all aspects of the study in real time.

There is a clear need for an intuitive, easy-to-use platform that simplifies study management, streamlines smartwatch setup, and provides real-time monitoring to ensure continuous and reliable data collection. Additionally, the platform must allow PIs to easily manage and oversee multiple studies simultaneously.

3 Usage Description

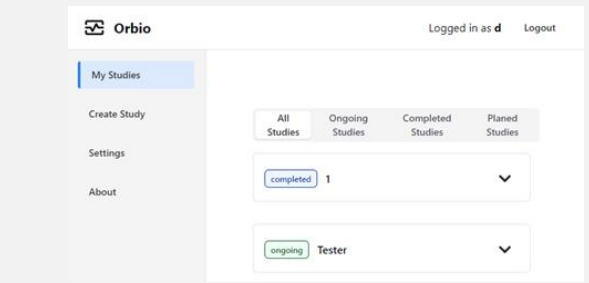
Users of Samsung Galaxy smartwatches can view their own biometric data in graph format and manage studies that they are participating in.Principal investigators can create studies, manage participants and view each participants' data and their adherence to data collection.

4 Interface and Interaction Workflow

All interaction is done via the web application interface. The home page, shows the login/signup pages, which can be either as a user or as a Principal Investigator (PI).

- During first login as a user, detailed steps to install the software to collect biomarker data from smartwatch are shown. Once the setup is completed, data will be shown in approx. 10 minutes. User can view its data, join a study via a study code and manage and track its studies, and change its profile data, accessing these views using the navigation bar.
- If logged in as a PI, PI's can directly create studies specifying the parameters desired for them easily, view all their studies (not started, ongoing or completed), and view a specific study's information and its participants when clicking on it, accessing these views using the navigation bar.

Both user and PI can access an "About" page that gives a description of all the functionalities, pages and how to use them. Furthermore, account information can be modified.



5 Conclusion and Improvements

Our main use case was accomplished, the interaction of principal investigators and users, and the management of studies and processing and visualization of biomarker data. Due to time constraints, the doctor and user use case was not implemented. While no major issues arose, some minor backend/frontend integration challenges occurred regarding endpoint usage and implementation. Our primary conclusion is that we misjudged the time required to complete this project.

The following improvements remain for future development:

- Doctor View: A dedicated view for sharing biometric data with doctors to aid in diagnosis.
- Data visualizations: more interactive and better-looking graphs could be shown.
- Markdown Editor: Integration of a markdown editor within the "Create Study" page.
- Interactive Tutorial: A post-signup tutorial to guide users through the webapp.

References

1. "Closing the Loop on AI and Data Collection". https://claid.ethz.ch.

Partner/Sponsor:

URL: http://claid-dashboard.ethz.ch