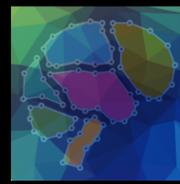


Integrating Big Data Strategies with Biometric Wearables and RFID Communications

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RFID Communications

- Implementing a Radio-Frequency Identification (RFID) software solution to increase efficiency at Merck's campuses.
- Automating the process to identify and track passive tags using a Zebra MC319Z RFID Scanner for potential chemical and instrument inventory.
- This tool will scan the buildings that house chemicals and instruments and update a SQL database.
- This tool will cut down on time spent looking for chemicals and instruments.

Methodology

- In Figure 1 we used D3.js to create a visual representation of what we would like to implement.
- There is a hover over feature that allows scientists to see which chemical or instrument they are looking for in relation to the scanner.

Biometric Wearables

- Implementing a biometric platform workflow and integration platform to track and improve patient's quality of life.
- Generating individual biometric data using Fitbit devices to mimic patient data.
- Developing a React Native mobile application to track patient's biometric data, pain levels, and quality of life.
- Automating data acquisitions using the official Fitbit API Python on a high-performance cluster (HPC) server for efficiency.
- Storing potential patient-centric clinical research on a SQL database for easy access.
- To further aid in dynamic data analysis, separate stand-alone visualization dashboards were developed using both the R Shiny packages and the D3.js library.

Methodology

- In Figure 2 We created a Biometric Workflow to demonstrate the different tools and methods that we are using to solve the task.
- In Figure 3 we created a stacked bar graph with a hover feature showing the Highly, Moderately, and Lightly Active miles for each day that were collected by our FitBit devices.

Conclusion

- Our end goal for the Biometric Wearables is to have a Fitbit Watch collect and store data in a Mobile Application to track and improve patient's quality of life.
- Our end goal for the RFID Communications is to automate and track passive tags using a scanner and uploading those to a database.
- **Future work** involves extended device integration as well as automated workflow-specific data visualizations within the pharmaceutical science space.

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Figure 1

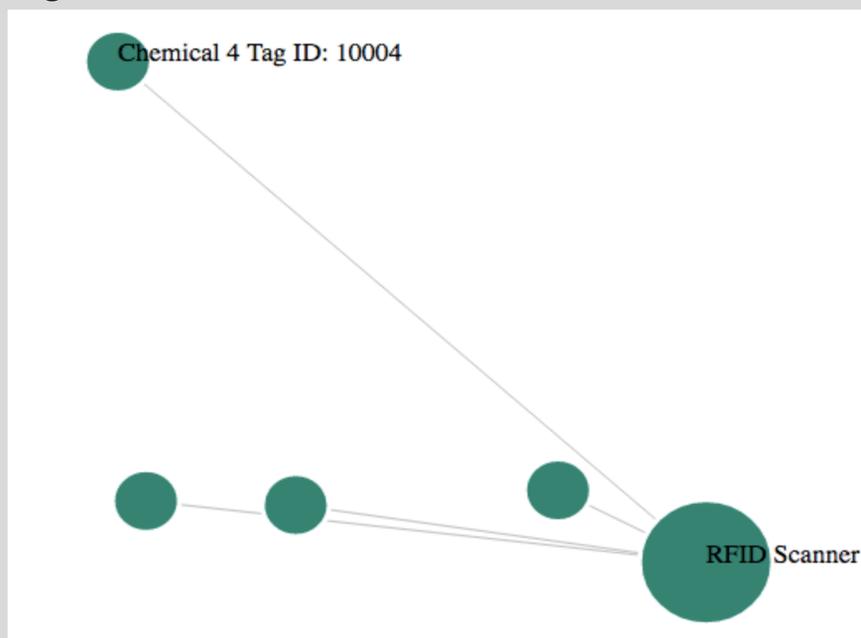


Figure 2

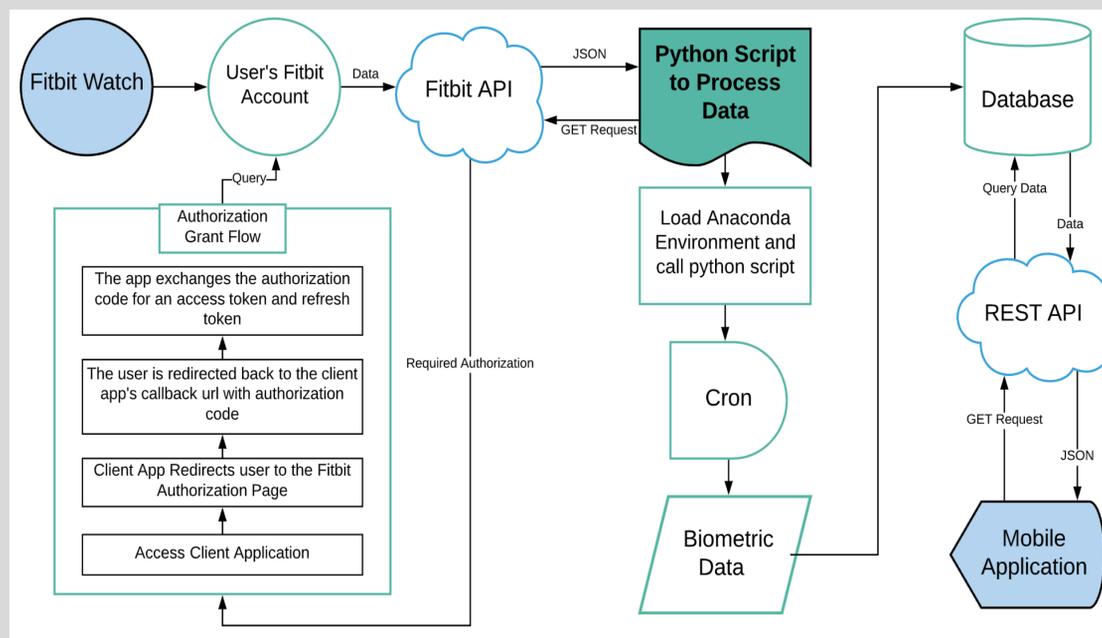


Figure 3

