NYU Fit

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Ideas, Inspiration

- We see so many students fall asleep in the library during final week. How can we make a change?
- With FitBit and Mi Band, which keep track of people's steps and sleep, we want to share students steps and sleep data with school and school can provide health and wellness support to help students survive final week.

What’s the plan?

- We want to built an app to support as many bands as possible,such as FitBit, Mi Band, etc and get users data to share with NYU.

Architecture

- Hack
  - Crack Android App of bands, such as Fitbit, Mi band, to figure out how they communicate with each other.
- Develop
  - Create Android App, connect android device with BLE device, get data and send to data analyzer.
- Data Analyze
  - Recommendation
  - Data Visualization
  - Implication

Architecture: Hack

How Bluetooth Low Energy Works:

Alice: Hi, Bob. I wanna data with ID of 0x002c

Bob: Hey, here you are. The value is 5b-0f-0a-1a-06-04-3b-11-00-04.

Architecture: Hack

How Bluetooth Low Energy Works:

Byte[0] --> level in%
Byte[1-6] --> year (should plus 2000) -month-day-hour-minute-second
Byte[7-8] --> charge times
Byte[9] --> status (1 = Battery low, 2 = Battery charging, 3 = Battery full (charging), 4 = Not charging)

Finally, this value shows that it's remaining 91% power, last charged time is 2015-10-26-6h-
04min-59s, it has been charged 11 times and the status is not charging.

Architecture: Hack

UUID	Meaning	Property
0xff01	DEVICE_INFO	Read
0xff02	DEVICE_NAME	Read and Write
0xff03	Notification	Read and Notify
0xff04	USER_INFO	Read and Write
0xff05	CONTROL_POINT	Write
0xff06	REALTIME_STEPS	Read and Notify
0xff07	ACTIVITY_DATA	Read
0xff08	FIRMWARE_DATA	Write without response
0xff09	LE_PARAMS	Read and Write
0xff0a	DATE_TIME	Read and Write
0xff0b	STATISTICS	Read and Write
0xff0c	BATTERY	Read and Notify
0xff0d	TEST	Read and Write
0xff0e	SENSOR_DATA	Read and Notify

Architecture: Develop

- Scan and Connect
- Read data from bands
- Save data

Scan and Connect

Open bluetooth and search the specific BLE device

Connect to the Gatt Server on BLE device

Get BLE services, characteristics using GattCallBack method

Read Data from band

Get protocols that represents the meaning of each services and characteristics

Using methods from BLE API to get values of services and characteristics

Analyze the values by the known protocols.

Save Data

Save data in custom database

Save data using sharedpreference

Architecture: Data Analyze

- Recommendation
  - the daily steps recommendation is calculated based on user's BMI score, age and gender
- Data Visualization
  - Daily steps is display in a weekly graph
- Implication
  - For users that do not meet the recommended steps, the app will send out warning to customers

What's Next? How can we improve?

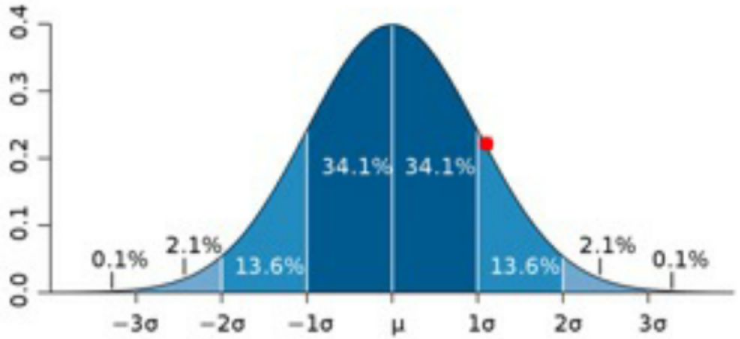
- Hack
  - Hack more bands and make our App powerful and collect more data.

  Develop

- Data Analysis
  - Currently we only have very limited data which stopped us from some further analysis. Once the platform is built and we have access to whole students data, we will make population distribution graph to let students know where they are compared to the whole university.

NYU FIT

Compared to the students in CS department, you average daily steps ranked top 16%.



Compared to the students in CS department, you average daily sleep is below 16% of the population.