Genomics Development Library

STEPHEN CHEN
MENTOR: GIL ALTEROVITZ
4TH ANNUAL PRIMES CONFERENCE
Background

Genomics continue to provide useful personal information:
- Growing number of consumers, lowering cost
- Disease risk, ancestry, drug response etc.
- Many apps are developed, for serious clinical or entertainment purposes
The APIs

- SMART Genomics API
  - Developed by Tom Chen last year at PRIMES
  - Imports data from 23andme, illumina etc.
  - Clinical standard

- 23andme API
  - API built by start-up company 23andme
  - Results and analysis of sequenced genome
Current API is Limited to Web Only

- OAUTH authentication requires many URL manipulations, designed for web-based apps only.
- Apps are not available to smartphones.
- Library aims to make fast development available in mobile platforms.
Background in OAuth API

1. User Authorization
2. Obtain access token
3. Access user data with token attached

Difficult to achieve in mobile devices.
Implementation (SMART)

- Client end implementation of SMART
  - Authentication
  - Access and parsing of user information
    - Currently includes user profile, disease risk, entire genome and specific SNP genotypes
  - Suitable for clinical apps
Implementation (23andme)

- Basic Information
  - SNP genotypes
  - Whole genome sequence
- Genome Analysis
  - Disease risks in percentage
Implementation Cont.

- Database Storage
  - Uses Android native SQL
  - Store and retrieve any data
- Data display methods
  - List display with graphics
Standalone Java Version

- Built for the general Java language
- HTTP requests + parsing JSON
- No database storage or anything Android platform-specific
Development Flow

Authentication

Obtain Access token

User Profile (Name, ID, Gender)

Genome information (Whole sequence, or specific SNP genotypes)

Disease risks (individual and population percentage)

~ 20 lines of code
App Demo(GeneMusic in App Store)

List of patients

Name
Davis Howard
Doty Johns

100+ downloads
Music Indication of Disease Risk (Clip)

High risk = dissonant, Low risk = consonant
App Demo Cont.

Login with 23andMe

mike.policari@gmail.com

Password

Login

Signup for free

Don't have an account? Create a free one!
You can use apps, and see what it's like to be genotyped.

Signup for free

© 23andMe
Summary

- Enabled fast development for Android
- Version cut out for Java language
- Android app developed using the library, 100+ downloads
Future Plans

- Implement all features of API
- Wider release as a SMART standard
- Methods to communicate data in interesting ways (generation of MIDI music etc.)
- Deploy HTML Documentations
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