



Post Partum Hypertension Monitoring Application

TEAM NAME: ALEX ZOELICK, ALEYSHA BECKER, JACKY TIAN, RACHEL MINEHAN, LUCAS RATAJCZYK

CLIENT: DR. KARA HOPPE (DO)

ADVISOR: PROF. WILLIS TOMPKINS

BME 200/300 FALL 2017



College of Engineering
UNIVERSITY OF WISCONSIN-MADISON

College of Engineering
UNIVERSITY OF WISCONSIN-MADISON

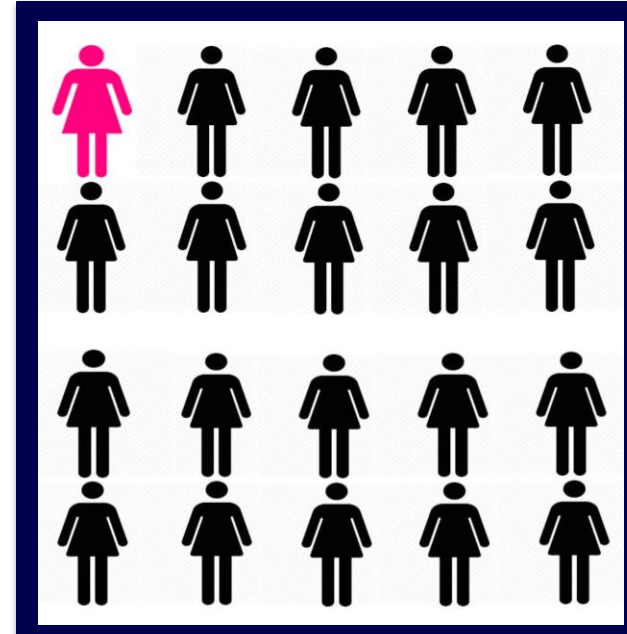
The original plan was to use X-code platform

ABSTRACT

- Hypertension is a leading cause of maternal death postpartum.
- Dr. Hoppe is working to reduce postpartum hypertensive hospital readmission [1]
- A Honeywell system currently monitors patients vitals.
- Less-than-ideal reviews from practitioners and patients.
- Goal: Create an iOS app that is similar to the Honeywell package.
- Prospective features: Bluetooth data upload, cloud data transfer, improved user friendliness.
- Future Features: video conferencing, personalization, push notifications

MOTIVATION

- Hypertension can present as late as six weeks postpartum [2]
- 5% of women experience PPH [2]
- Discrete symptoms [2]
- Goal: Eliminate Hospital readmissions



PROBLEM STATEMENT

- Current monitoring apps are most appealing to patients with chronic hypertension
- Current apps lack interaction between physicians and patients and HIPAA-compliant data transfer.
- A new mobile app is needed to work in conjunction with a Bluetooth-enabled blood pressure cuff and heart rate monitor.

BACKGROUND RESEARCH

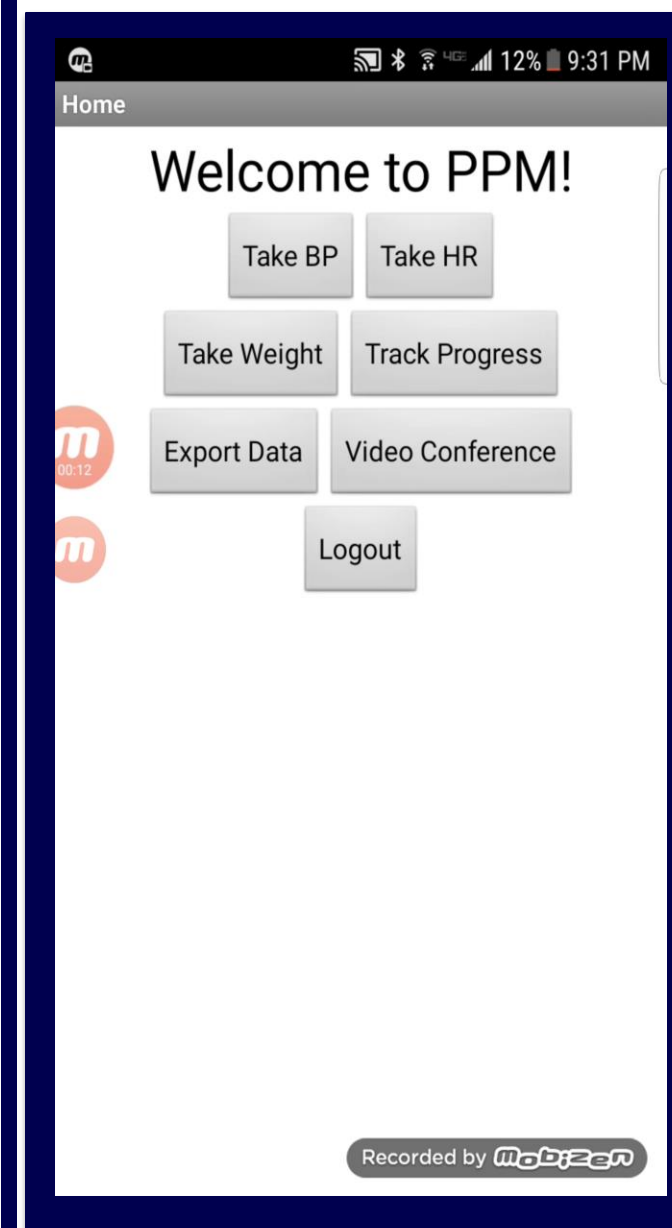
- Hypertensive disorders complicate up to 10% of all pregnancies [3]
- Diagnostic Criteria for Preeclampsia: 140 mm Hg systolic or 90 mm Hg diastolic on two occasions at least 4 hours apart after 20 weeks of gestation [3]
- Data shows home blood pressure monitoring to be useful and help detect initial hypertension [4]

DESIGN SPECIFICATIONS

- HIPAA Regulation and Compliance
- Accuracy and Precision
- User Friendliness
- Data Entry (App to Hospital / Monitor to APP)
- Feasibility
- Aesthetics
- Safety
- Cost

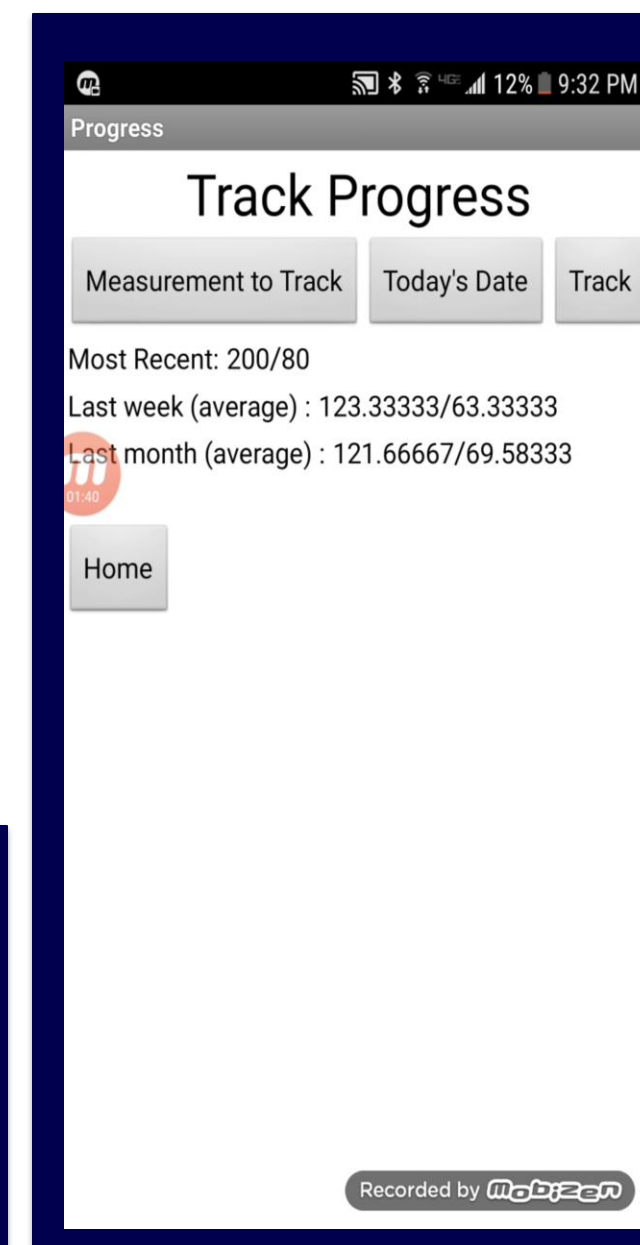
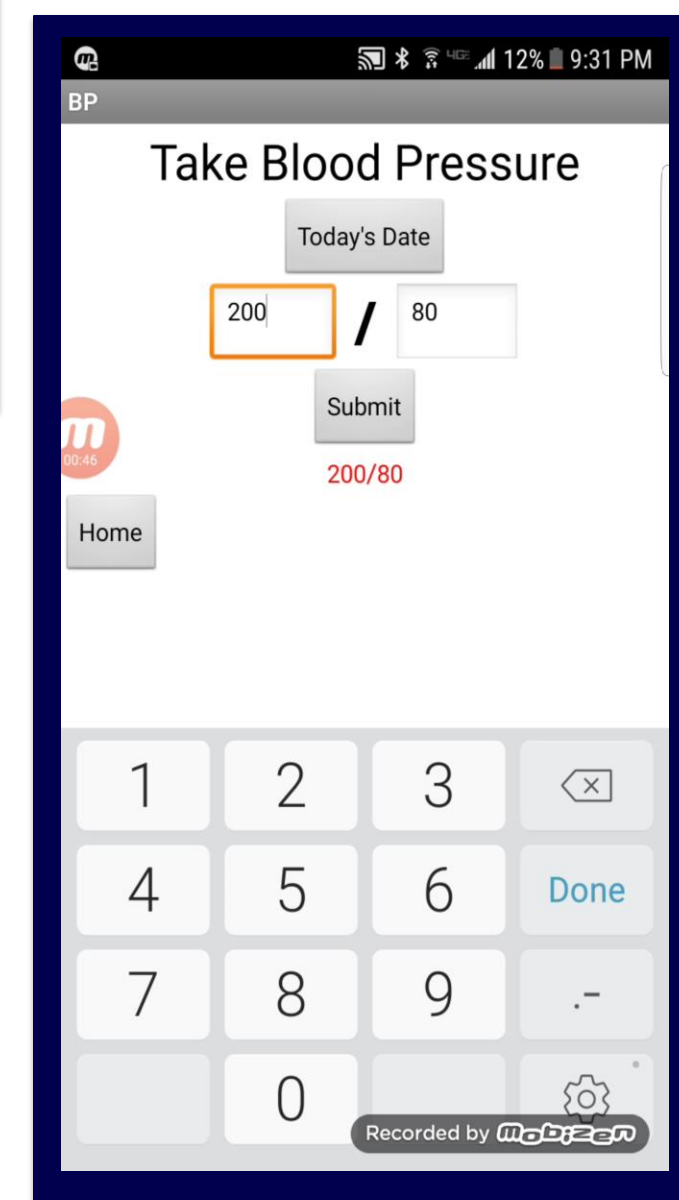
FINAL DESIGN

- The final design is a proof-of-concept Android app, intended to show that a user-friendly health tracking app is feasible while staying within the group's means.



The home screen improved on the number one user complaint – freedom of navigation within the app.

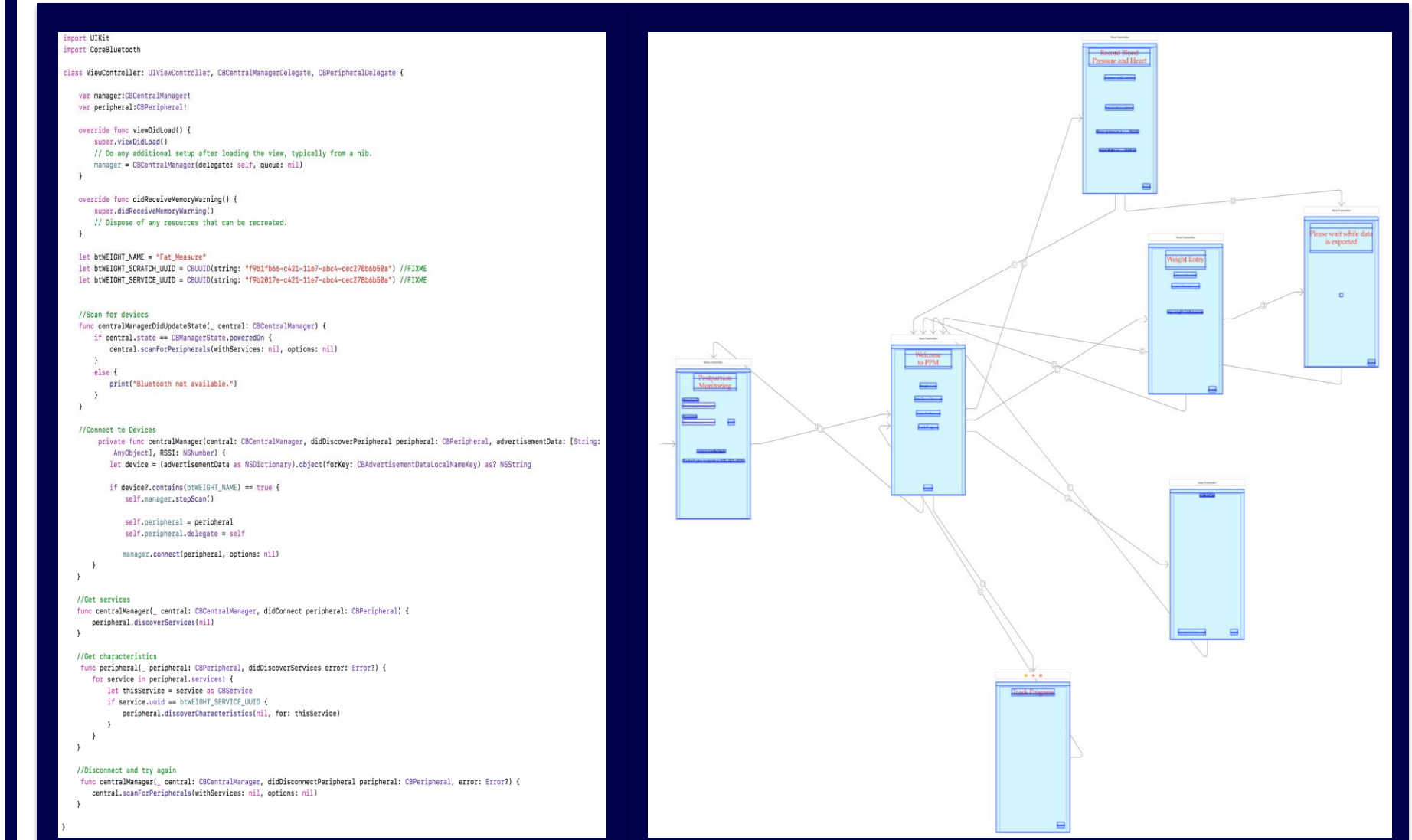
Manual data input was implemented as a backup for Bluetooth. Blood pressure readings change color if they fall outside a healthy range.



The Track Progress screen shows average statistics over the past week and past month for each health measurement.

- Though our final design isn't HIPAA compliant, it shows that an iOS app that meets the client requirements could be easily developed by more experienced Swift programmers.

DISCUSSION



- Given more time, and an experienced programmer, the project can easily be accomplished
- Future improvements may include:
 - Customizable interface
 - Automatic Bluetooth data export
 - Allowing manual override if there is an issue importing data
 - HIPAA compliance
 - Set up of video conferences and alerts

ACKNOWLEDGEMENTS

Our team would like to thank Dr. Hoppe for providing us the opportunity to work on this project and Professor Tompkins for his continued insight throughout the semester.

REFERENCES

[1] UW Health. [Online]. Available: <https://www.uwhealth.org/finddoctor/profile/kara.k.hoppe.do/10016>

[2] Mayo Clinic Staff. (2015). *Postpartum Preeclampsia*. [Online]. Available: <http://www.mayoclinic.org/diseases-conditions/postpartum-preeclampsia/basics/causes/comp-20035395>

[3] ACOG. Hypertension in Pregnancy. Report of the American College of Obstetricians and Gynecologists' Task Force on Hypertension in Pregnancy. *Obstet Gynecol*. 2013;122(5):1122-1131.

[4] K. Nouse. (2016, August 19). *Top Four Blood Pressure Monitoring Apps* [Online]. Available: <https://www.engadget.com/2016/08/19/top-4-blood-pressure-monitoring-apps/>