RunWare

Run Anywhere, with RunWare

ATHLETIC **INNOVATIONS**

Friday, **April 10th 2015**

Agenda

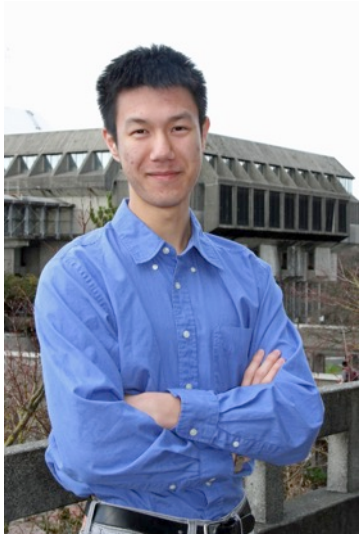
- The Team
- Motivation
- Market
- Timeline
- System Overview
- High Level Design
- Budget
- Lessons Learned
- Conclusions
- Acknowledgements and References

The Team

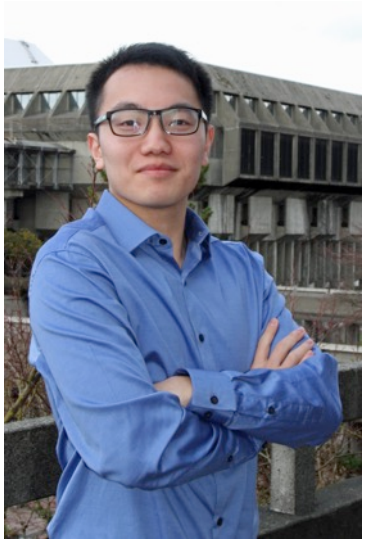
Sam Hafezi
Chief Executive Officer

Neha Chhatre
Chief Marketing Officer

Chelsea Huang
Chief Financial Officer

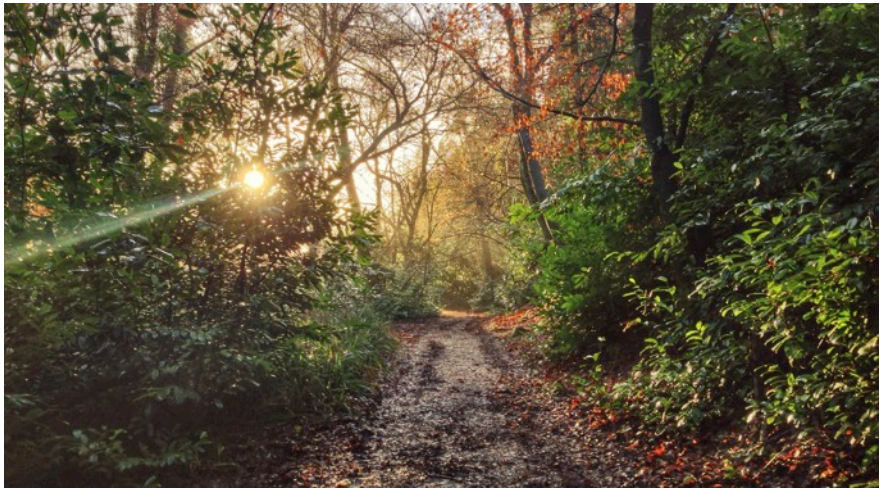


Michael Ng
Chief Information Officer



Ricky Tran
Chief Technical Officer

Motivation



- Scenery
- Fresh Air
- Trails

- Heart Rate
- Accurate Distance Measurement
- Calories Burnt

Market

fitbit TEMP TRAQ™ Withings

sensoria JINS Google

Prof Bruce Keogh: wearable technology plays a crucial part in NHS future

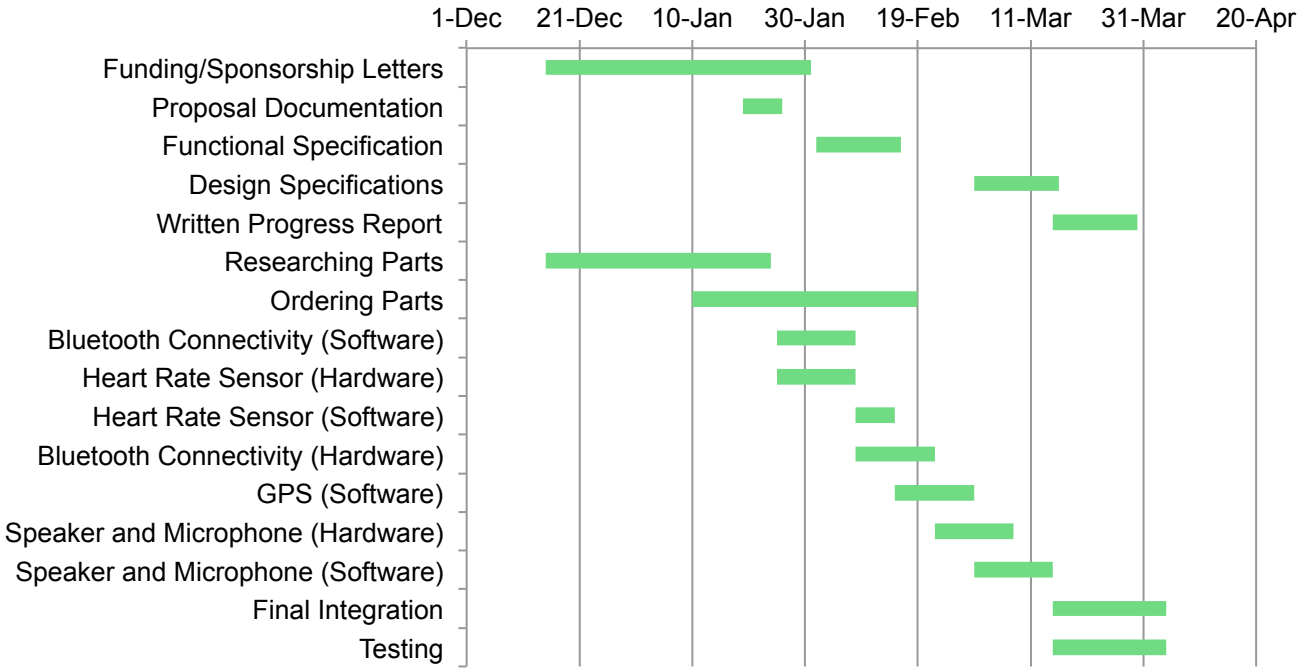
NHS's top doctor believes gadgets that record heart rate and other health information will revolutionise healthcare

Intel Invests $24.8M in Vuzix to Grow in Wearables Market - Analyst Blog

South Korea to invest $400M into startups making wearables, drones, and self-driving cars

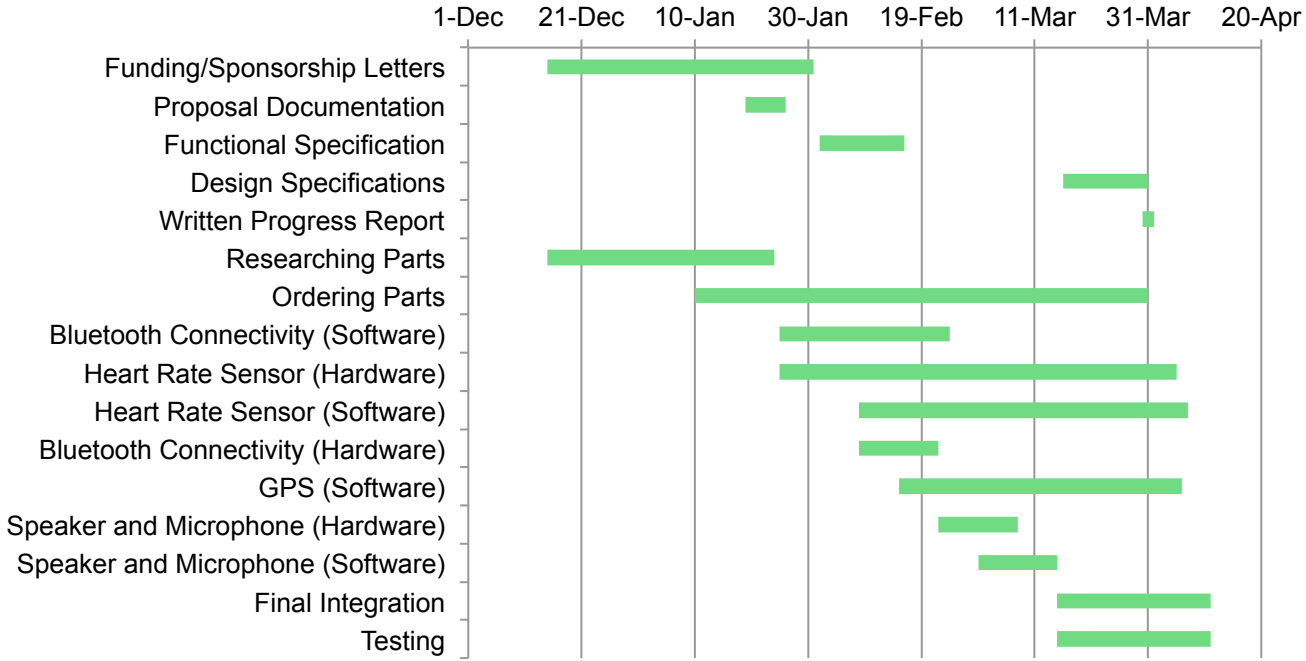
Timeline

Original Timeline

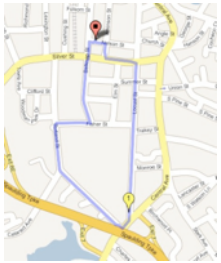


Timeline

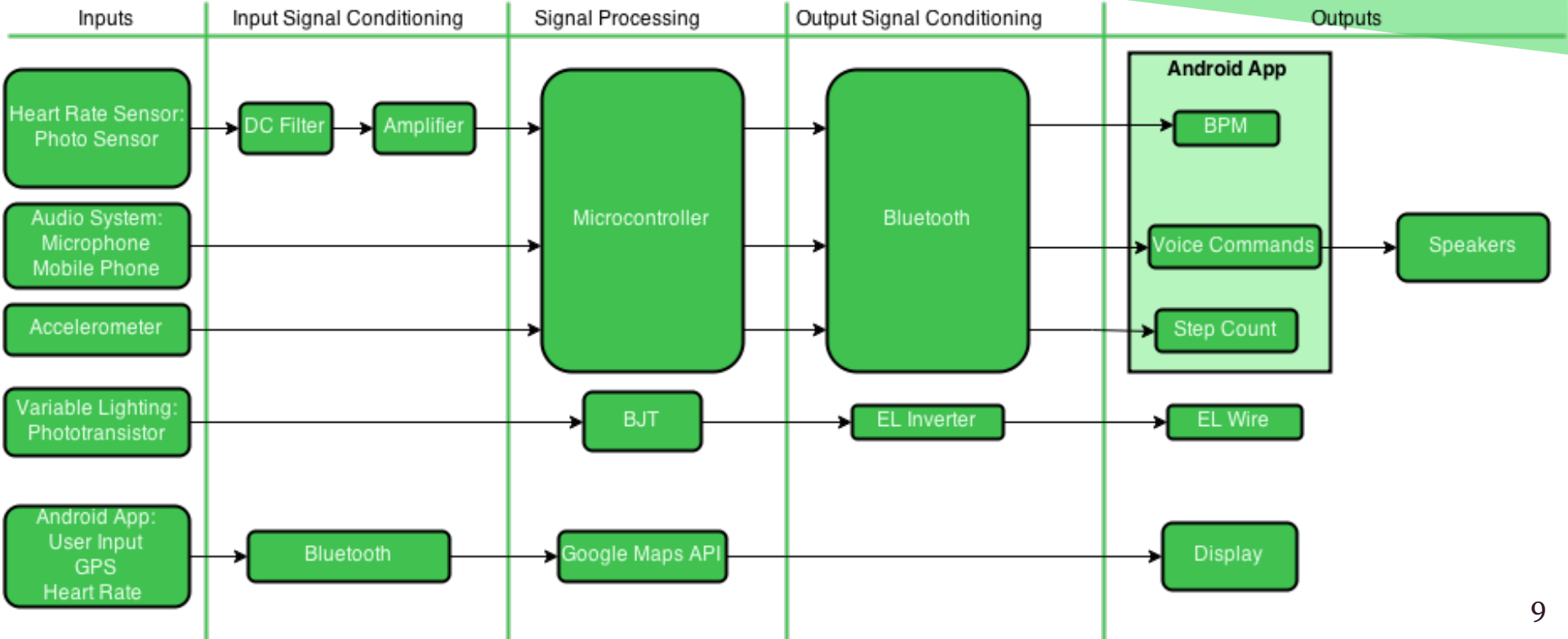
Revised Timeline



System Overview

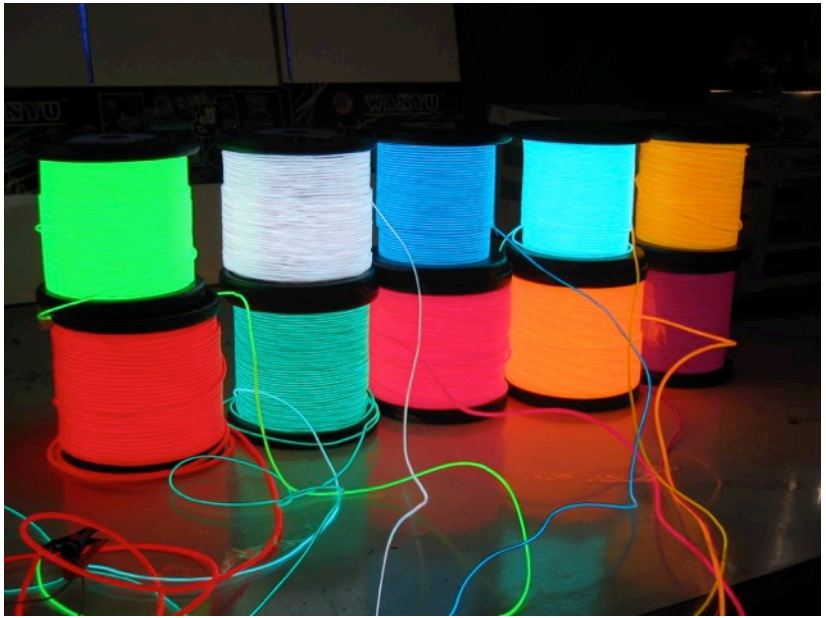


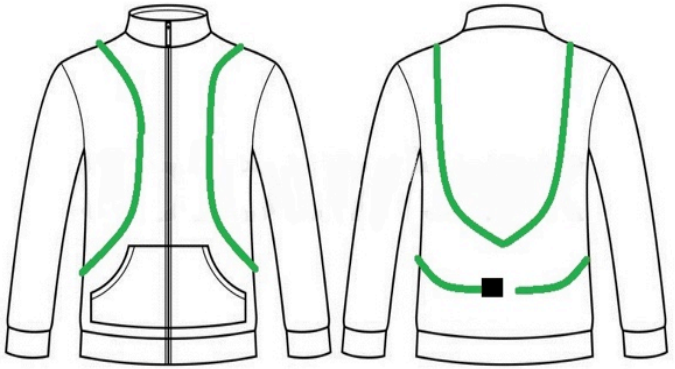
High Level Design



Variable Lighting

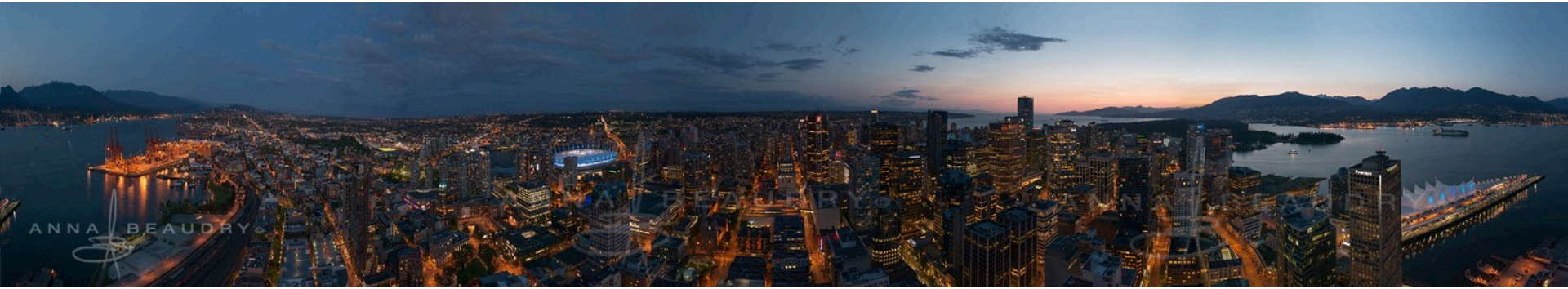
- Electroluminescent (EL) wire illuminates the jacket



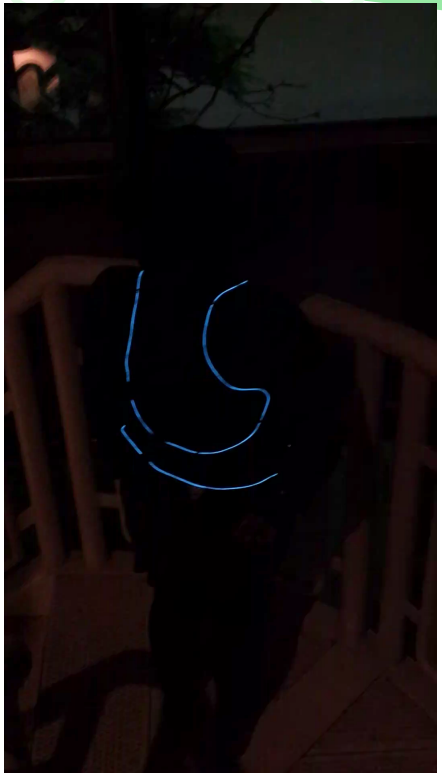


Variable Lighting

- Phototransistors on the shoulder detects incoming light and adjust the brightness of the wire accordingly
- The user can set an “indoor” or “outdoor” mode via the RunWare Application

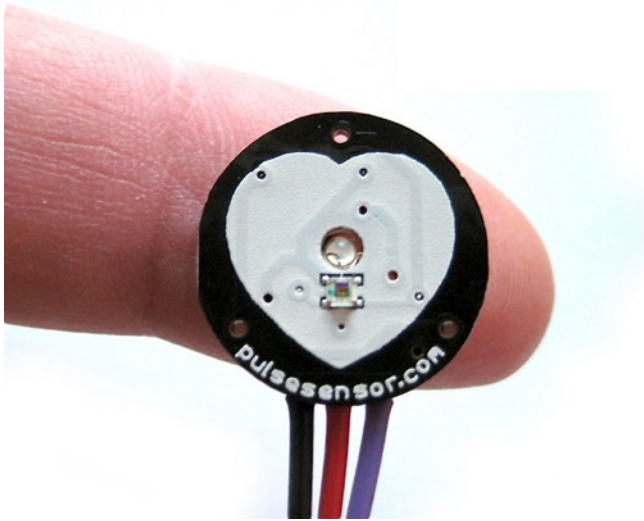


Variable Lighting - Video



Heart Rate System

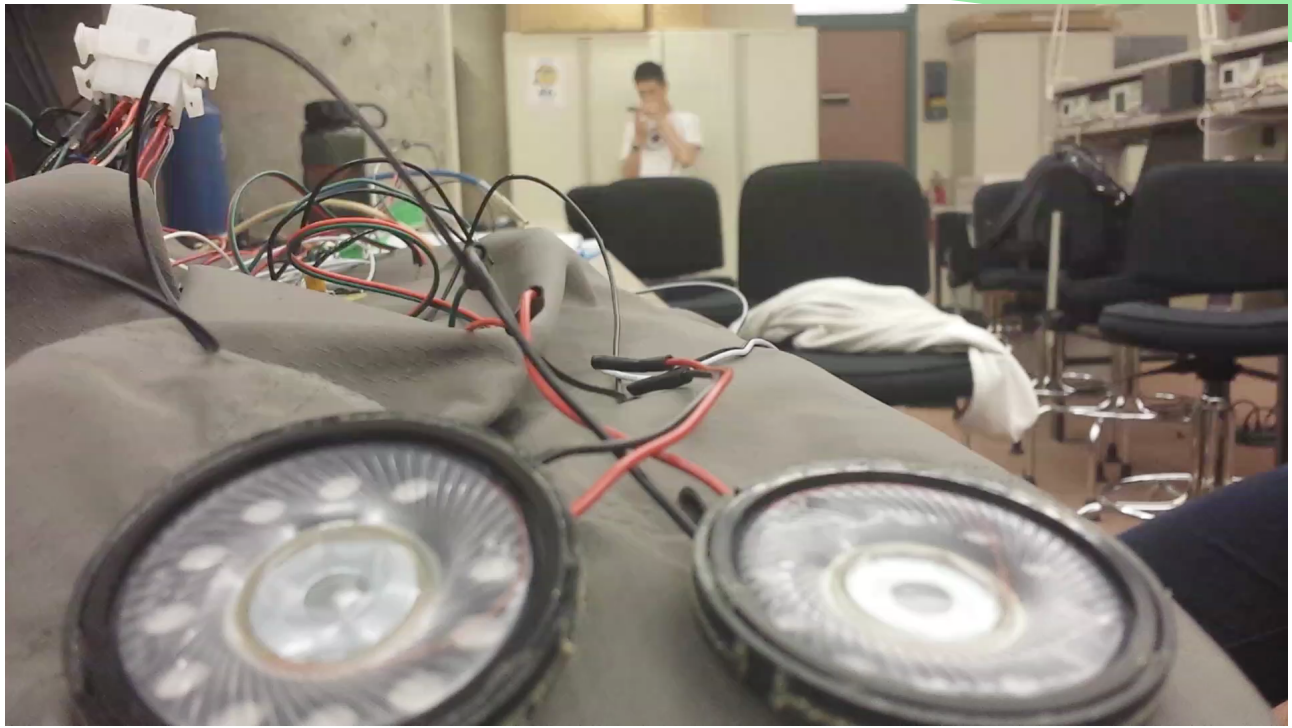
- Uses a Pulse Sensor as an optical heart rate sensor
- The user presses on a button upon the jacket to begin measuring
- The results may be viewed on a phone via the RunWare Application



Audio System

- Speakers located in the collar of the plays music sent from the user's phone
- Answer calls using the built-in microphone, which is also located in the collar
- The speakers and microphone are enabled with easy to use push buttons

Speaker Demonstration



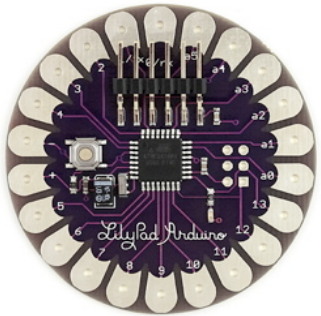
Microphone Demonstration

Accelerometer

- Measures movement of user in 3 axes
- Movement data sent to microcontroller
- Once movement passes threshold repeatedly, movement is counted as a step
- Step count sent to application via Bluetooth

Microcontroller

- Lilypad Arduino chosen as our microcontroller
- Controls Variable Lighting system
- Calculates heart rate from pulse-sensor
- Computes step count from accelerometer
- Controls push-buttons for Bluetooth hands free phone calling



RunWare Application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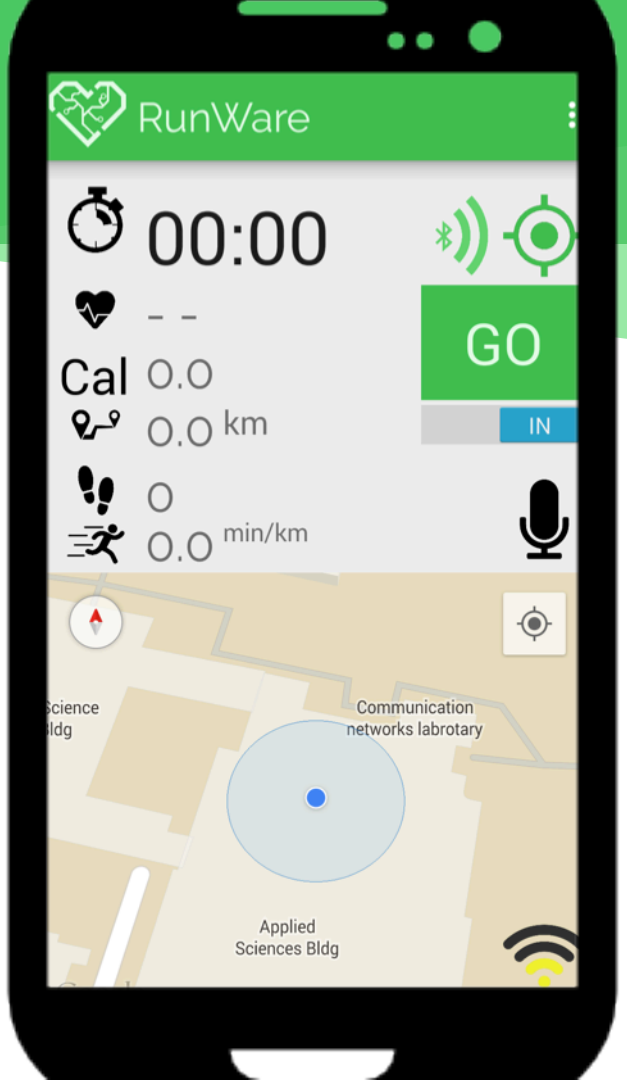
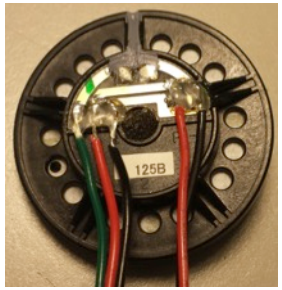

RunWare
00:00
- -
GO
Cal 0.0
0.0 km
IN
0
0.0 min/km
Communication networks labrotary
Applied Sciences Bldg

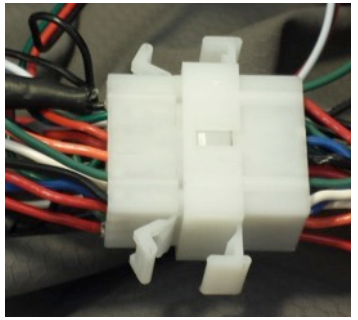
RunWare Application

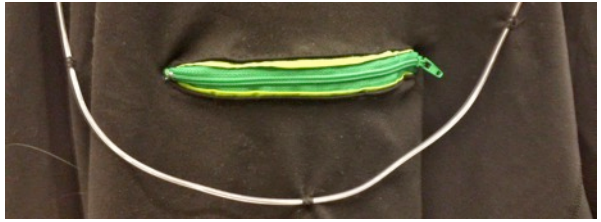
- Receives heart rate and step-count via Bluetooth
- Tracks the runner’s location using GPS
- Line tracking to shows the path taken
- Measures and displays pace and total distance ran
- Calculates the total amount of calories burnt
- Accept user voice commands to start and stop tracking
- Speaks out statistics on activity including pace, heart rate, elapsed time, and total steps.

Enclosures



- Materials Used:
  - Insulated Heat Shrink
  - Hot Glue
  - Water-Resistant Nylon
  - Needle & Thread
  - 24-pin Connector





Budget

Projected Cost	Actual Cost
$762.63	$716.19

- Cost breakdown
- Funding resources
- Estimated cost per jacket: ~$150

Lessons Learned

- Be prepared to purchase alternative components

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- Be prepared to purchase alternative components
- Creating an app with no previous experience doesn’t have a learning curve, but a learning cliff
- Integration can take up nearly 50% of the total project time

Lessons Learned

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- High quality wires make a big difference
- Test all hardware after bread-boarding and prior to placing in enclosure

Future Plans

Conclusions

- Most features worked on their own
- Integration introduced many difficulties
- Despite this, we believe we were able to achieve a demonstrable prototype
- Future plans

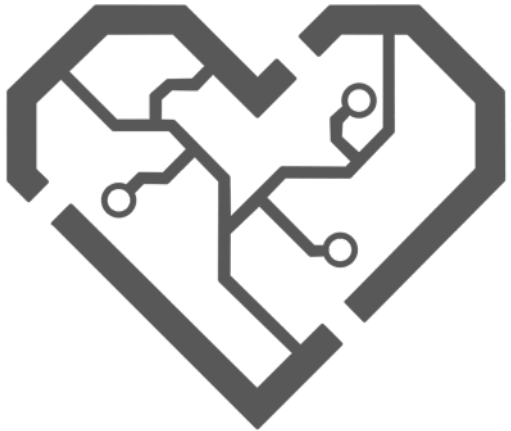
Acknowledgements and References

Professors Rawicz and Whitmore

LOTUSACTIVA CEO Lisa Palleson-Stallan

Engineering Science Student Endowment Fund

Thank You



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Questions?