lifeLogger

never forget again

15-549: Embedded Systems Design
Team 20

Jian Cheung, Chris Jarret,
Saxon Parker, Eleazar Vega-Gonzalez
The Crew

Eleazar Vega-Gonzalez
evegagon@andrew.cmu.edu

Chris Jarrett
cjarrett@cmu.edu

Jian Cheung
jccheung@andrew.cmu.edu

Saxon Parker
slparker@andrew.cmu.edu

http://www.ece.cmu.edu/~ece549/spring12/team20/index.html
What if your journal wrote itself?
Our Solution

Never forget a place
  Log everywhere you go
Never lose a thought
  Take notes throughout your day
Never miss a friend
  Get notifications when your friends are nearby
Our Features

Footprint of the day
  Display your daily journey through life
Places of Interest of the day
  Highlight key places of your day
Social integration
  Find nearby friends in real-time
Personalized description of the day
  Reflect on any important interactions

lifeLogger
Functional Requirements

Collect GPS data onboard the lifeLogger
Communicate profile information using Bluetooth between two lifeLoggers
Notify the user about nearby friends in real-time on the smartphone
Transmit location data between
  lifeLogger and Smartphone utilizing Bluetooth
  Smartphone and Web Server utilizing WiFi
Analyze data on the web server
to be able to detect when two friends are nearby
to present the user a view of the data
Architecture

Database:
Contains location info for each user, as well as who their friends are

Website:
Allows users to see where they were for any given day, as well as what friends were with them at each place.
Experiments

lifeLogger Tests
  Seconds taken to establish GPS fix
  BlueTooth data Throughput

Android Application Tests
  Phone End-to-End Latency/Throughput
  Manual Upload Latency/Throughput

GPS Accuracy
  Latitude/Longitude Accuracy of a fixed point
Packet throughput dependant on Android OS
Latency determined by when scheduler decides we can run
Throughput of Bluetooth and Wifi provide adequate throughput for timely real-time data transfer
Accuracy of GPS Bee was more consistent than location data collected from Galaxy S
Manual Upload to Server Latency

Latency (secs)

Packets

Manual Upload to Server Latency
Background Service Process Packet Latency

Latency (s)

MAX  27324
MIN  2857
MEAN 12261.96667
STD  5265.635662

Packets
Ultimately, focus was on reliability over speed. The user never sees data transfer or uploading, so it is more important that the transfers are reliable rather than quick. Many fail-safes put in place to ensure the system can recover from errors both in hardware and software.
Other Features

Device to Device Bluetooth Communication

In order to provide real-time notifications of nearby lifeLoggers, device-to-device communication has been established between lifeLoggers. Our implementation allows for scalability between multiply nearby lifeLoggers.
Next Steps

Custom Hardware
A custom PCB coupled with a LiPo battery would help reduce the size and battery life of the device. A smaller device would be less obtrusive and provide a better user experience.

Photo Uploading
Allow the user to take pictures on their Android phone and upload them to the server, so they can be integrated into their digital journal.
Conclusions

Learned

Android, Arduino, BlueTooth, node.js, MySQL, GPS, Designing User Interfaces

Accomplished

Device to device communication, Android background services, web design, developing usable User Interfaces

Different

Use parts with proper documentation, restructure Android app based on knowledge acquired during development,