

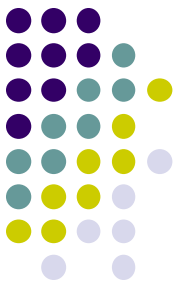
Ubiquitous and Mobile Computing

CS 4518: *LaundryBuddy*

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The Problem: Laundry is a Hassel

- Laundry → inconvenient but necessary chore
- The average American spends 80 min/week on laundry
- Shared laundry machines complicate the laundry process
 - No way to know if machines are in use
 - Broken machines may not be marked





Motivation: Why It Matters

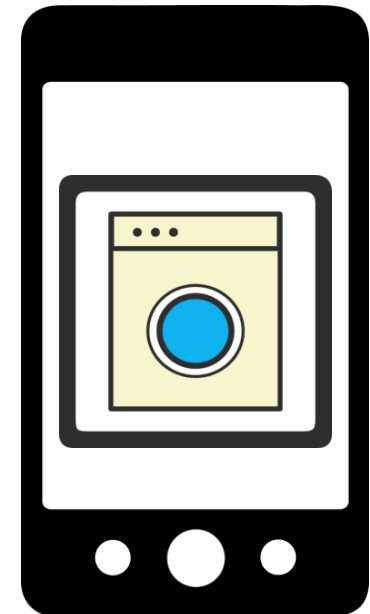
- Students especially dislike household activities
 - The average adult spends **1.1** hours / day
 - The average college student spends **0.0** hours / day
- Potentially save a lot of time:
 - Laundromats are a \$5 billion industry in U.S.
 - Save time → Save money
 - Reduces strain on laundromats





Solution: *LaundryBuddy*

- GeoFence laundry centers and use activity to estimate occupancy/availability
 - Initially start with laundromats
 - Crowdsourcing laundry locations and numbers of machines
 - Report broken machines
- Additional handy tools:
 - Simple laundry instructions
 - A laundry timer
- **Result:**
 - Match supply and demand
 - More efficient utilization of shared resources

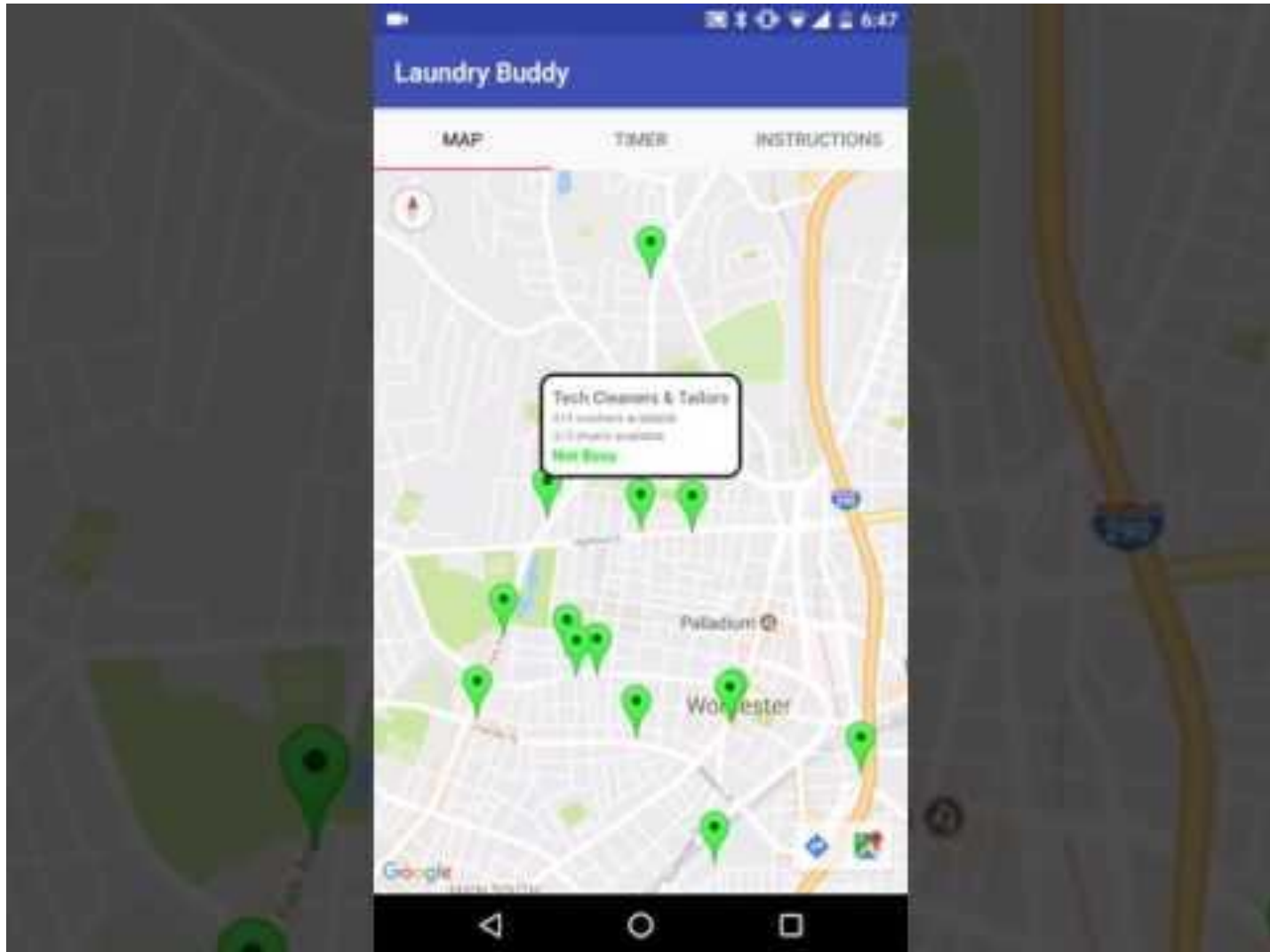
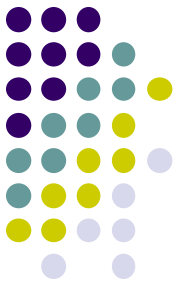


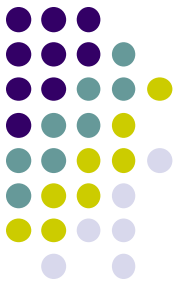


Related Works

- Online services allow you to schedule laundry pickup and delivery
- Apps in the Google Play store cover pieces, but not all of what LaundryBuddy does
 - LaundryGuide
 - LaundryReminder
- Some “smart” washing machines have remote control apps

Video

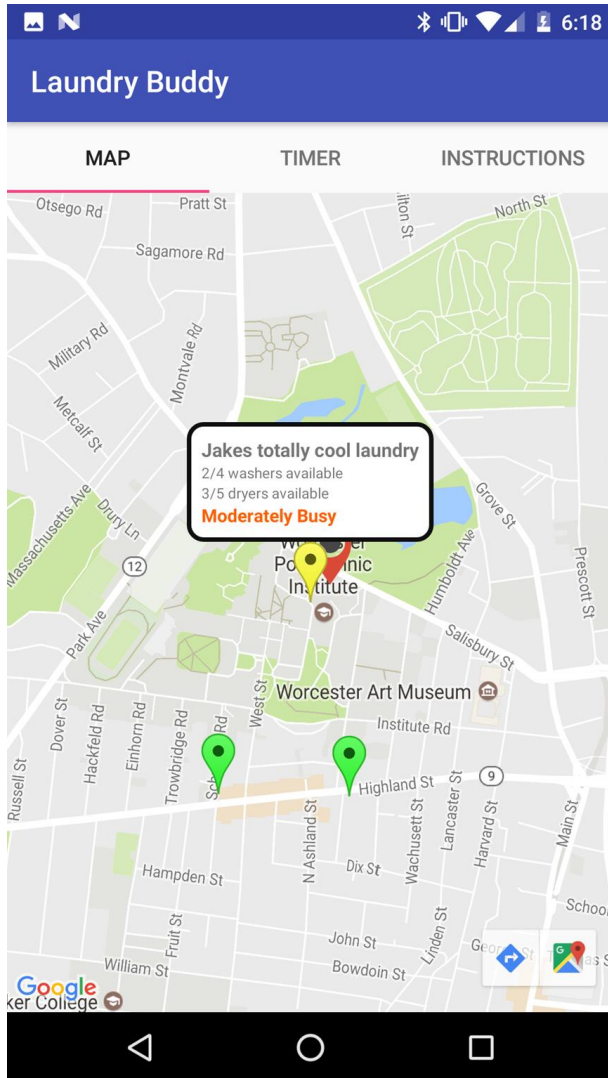
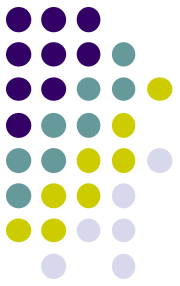




Software Implementation

- Google Places and Maps
 - Lists of laundromats
 - User Location
 - GeoFences
- Google Design Library
- Node + MongoDB backend to store locations' activity and reports
 - Android Volley
- Timer widget using alarm/notification system

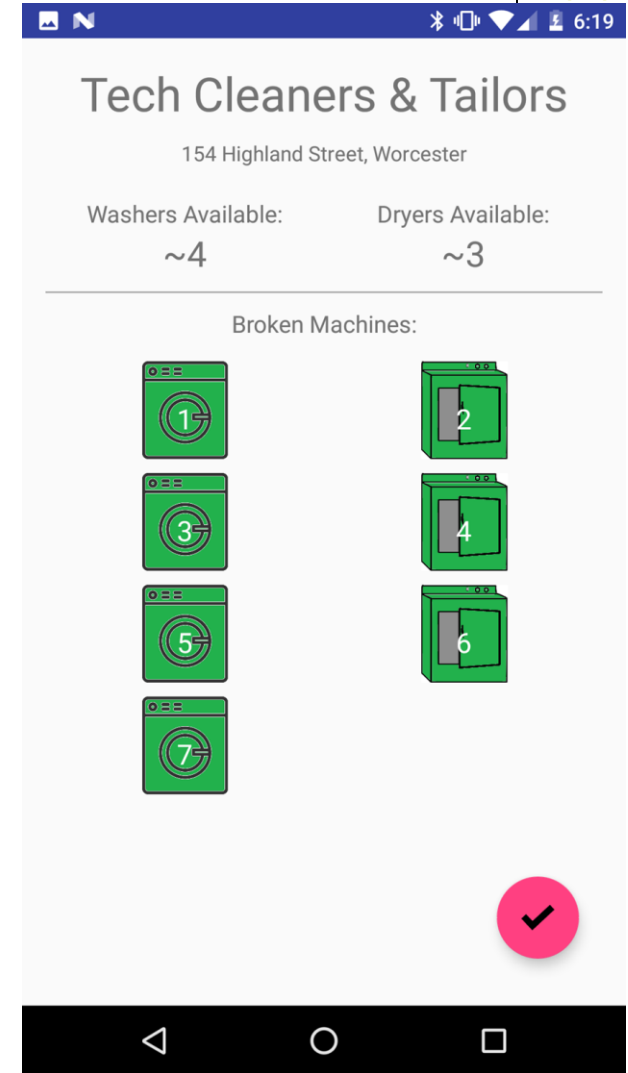
App Design



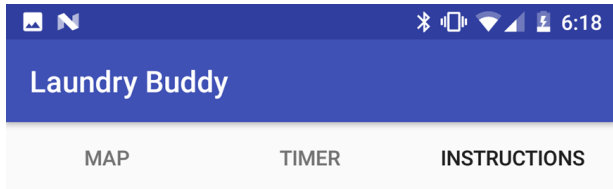
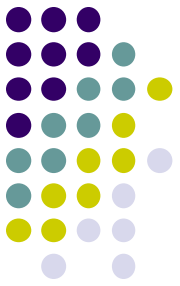
- Map created by GoogleMaps
- Uses Geofences to detect entering a user location
- Estimate machines available based on number broken and amount of check-ins
- Estimate busyness from number of recent check-ins

App Design cont.

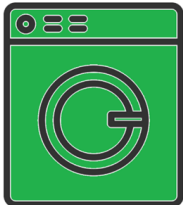
- Show more details about a laundry location
- Report that individual machines are broken
- Also show estimation of number of available machines



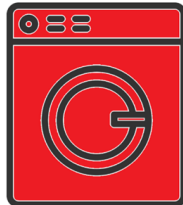
App Design cont.



To use LaundryBuddy, start by browsing the map for a location.
Tapping a location will present you with information about the current status of the location, such as the number of washers and dryers available.
Tapping the location again will open that laundry location's page.
On the laundry location's page, you will see a grid displaying all of the washers and dryers present at the location, as well as how busy the laundromat is.
Tapping any machine icon will change the status of the machine for all LaundryBuddy users to see. A green machine is working as normal, and a red machine is broken or out of order.
If you discover that a machine is not functioning properly, please tap the icon for that machine to alert other users!



This machine is working!

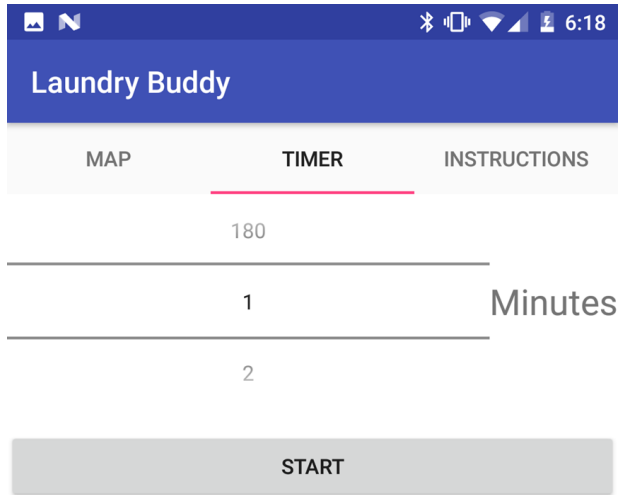


This machine is broken.
DO NOT USE!

- Display instructions for using the app and for doing laundry in general
- How to report broken machines

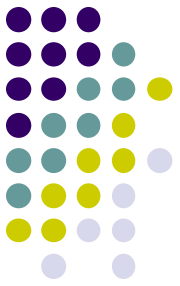


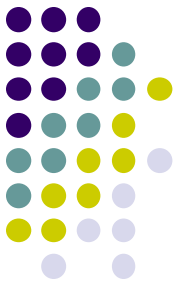
App Design cont.



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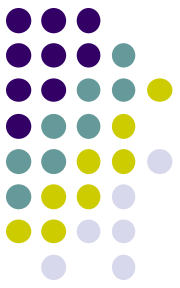
- Simple timer to be notified when your laundry is finished
- Uses Android alarm API





Evaluation/Results

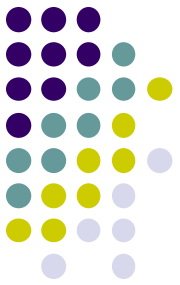
- Based on evaluation results
 - 70% college students said it would be useful and that they would use it.
- Average 65% for ease of use
- Some suggestions:
 - Protections against false user input
 - Tutorial at launching screen



Future Works

- Support from school and local laundry business
 - Initial dataset of laundry places
- Point System
 - Higher check-in percentage → discount/giveaways
- User Identification
 - Google Identity Platform
 - Firebase Appengine
 - Multi-user verification of updates
 - Blacklist users
- UX Improvements





References

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