SmartCommut

GROUP: JEFFREY CHAVES, CORY TAPPLY, TREVOR VALCOURT
Problem

- Being late negatively impacts lives in many ways
- Traffic conditions can cause employees to be late to their job because of the longer-than-usual commute
  - Examples: weather, accidents, etc.
- Tardiness can damage reputations and embarrass individuals in addition to hindering productivity in the workplace [2]
- Being late is also indicative of negative personality traits [2]
Consequences

- According to a new CareerBuilder survey[1]:
  - 29% of workers admitted to coming in late at least once a month
  - 16% of workers say it is a weekly occurrence for them
  - 53% of employers expect employees to be on time every day
  - 41% of employers have fired someone for being late

- An ABC study also found that[2]:
  - 15 to 20 percent of the U.S. population is "consistently late," especially when it comes to work
  - American CEOs are late to eight out of every 10 meetings, and when CEOs are late by 10 minutes every day, it costs the U.S. economy $90 billion in lost productivity.
Solution

- Application to prevent tardiness while maximizing time sleeping, working, etc.
  - Set alarm(s) for each commute you need to make
  - Simple interface to provide application with supporting information
  - Machine learning to analyze and predict the user’s habits
  - Option to cancel the alarm if activity is detected
Social Benefits & Target Community

- **Social Benefits:**
  - User arrives on time to appointments / meetings / etc.
  - Saves the user from embarrassment of arriving late

- **Target Community:**
  - Those who are frequently late
  - Any users who commute to work
  - Any users who have time sensitive appointments
  - Any user who commutes to different work locations
Related Work: Interruptive [3]
Related Work: Interruptive [3]

- **Similarities**
  - Application to prevent tardiness
  - Can specify preparation time needed

- **Differences**
  - Doesn’t calculate commute time based on traffic conditions
  - Not specifically for commuting, doesn’t launch Google Maps
  - Must manually change preparation time if inaccurate
  - Must manually input tardiness if late to destination
Related Work: Google Maps

- **Similarities**
  - Calculates time needed to reach destination
  - Provides directions to destination
  - Launches from within SmartCommute

- **Differences**
  - Doesn’t account for time needed to prepare
  - Not aware of what time the user needs to arrive
Related Work: Alarms

- **Similarities**
  - Alarms to alert user

- **Differences**
  - Alarms don’t automatically adjust when inappropriately set
  - Cannot launch Google Maps directions automatically
Methodology / App Design

SmartCommute
Go to Work
9:00 AM

Go to the Gym
10:00 AM

Team Meeting
4:00 PM

Commute Details

Commute Name:
Team Meeting
Arrival Time:
4:00 PM
Preparation Time:
5 minutes
Alarm Tone:
Silent
Destination:
100 Institute Rd, Worcester, MA 01609, USA
Days:
Friday

EDIT COMMUTE
DELETE COMMUTE

Commute Name:
Team Meeting
Arrival Time: 4:00 PM
Preparation Time: 5 minutes
Alarm Tone: Silent
Destination: 100 Institute Rd, Worcester, MA
Days of the Week:
S M T W T F S

Alarm will sound in 4 hours, 11 minutes and 8 seconds

powered by Google
Methodology / App Design

Wake Up! 10:48 AM

Begin Departure 10:53 AM
Methodology

- For each commute user enters:
  - Location of destination
  - Desired time of arrival (ToA)
  - Time needed to prepare
  - Days of the week
- Application sets two alarms for each commute:
  - When to begin preparation (wake up)
  - When to depart
- Application launches Google Maps with directions to the destination after departure alarm sounds
- Detect user’s arrival using Google GeoFence
Methodology

- User can easily add new commutes, edit and delete existing commutes, and toggle the alarms on or off for each commute
- Application uses machine learning to analyze commute patterns and automatically edit alarm times based on user history
- If driving user activity is not recognized when user should be commuting, additional alarm will sound (Vision)
- If user awakens from sleeping before preparation alarm is set off the application gives the option to cancel alarm (Vision)
  - Departure alarm will still be active
Implementation

- Software/Libraries Used:
  - Google Maps Directions API
  - Google Maps PlacePicker
  - OpenWeatherMap API
  - Encog Machine Learning
  - Android AlarmManager Library
  - SQLite for Android
  - Geofences
Evaluation

- Complete evaluation requires weeks of use.
- User testimonials revealed:
  - Users would love to be woken up earlier if they needed to due to weather but don’t want to have to think about it. (plan ahead)
  - Users work at a different office once a week and sometimes forgets to leave a little early that day. SmartCommute alleviates that problem.
  - Users liked to be shown a different route to work if their usual route had an accident slowing down traffic.
  - One user said “How soon can I have this app?”
Vision / Future Work

- Integrate Activity Recognition
- Integrated as an Internet of Things app
  - Linking with your smart/autonomous vehicle
  - Cooking breakfast after morning alarm
- Move heavy computations to a server
- Base models for training data
- Multi-Threading for better performance
References

1. http://resources.careerbuilder.com/hr-news/this-year-s-most-bizarre-excuses-for-being-late-to-work-2