

# Ubiquitous and Mobile Computing

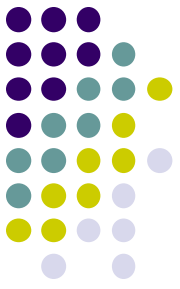
## CS 4518: The SNAP App

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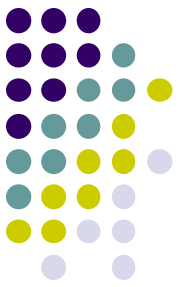




# The Problem

- WPI's SNAP Shuttle is a great service, but needs improvements
  - Requires calling the SNAP number and giving information
  - Drivers and passengers cannot communicate
  - SNAP requires an operator to route requests to SNAP drivers



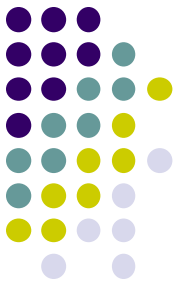


# Mobile Computing to the Rescue

- All of these problems can be solved with mobile computing!
  - No more phone calls
  - Easy communication and tracking
  - Server handles all routing



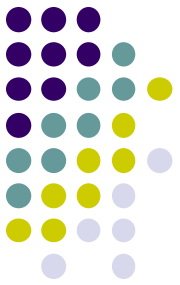
# Related Work



SNUBER

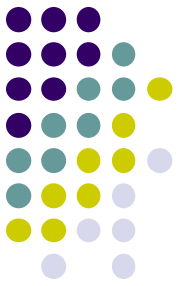
# The Snap App





# The Server

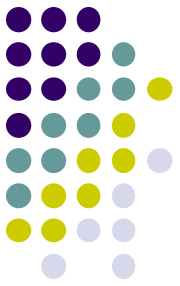
- A RESTful API manages communication driver and passenger
  - Eg. HTTP GET, POST, PUT, DELETE
- Uses MongoDB databases to store ride requests and current driver locations
- Assigns ride requests to a in-service SNAP shuttle



# The Driver App

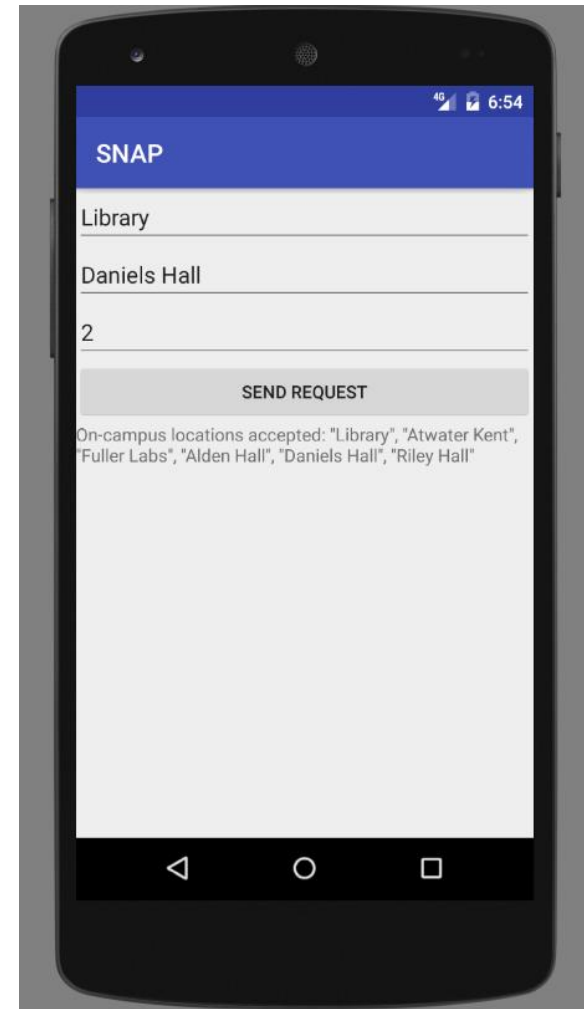
- Displays all of the assignment for the SNAP shuttle
- Posts information to the server about status of ride
- Location Service posts driver location to server
- Open google map with trip direction

<https://www.youtube.com/watch?v=EuHiS0wGQ7A&feature=youtu.be>

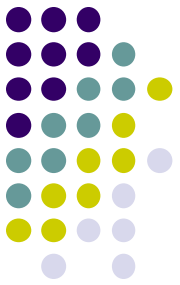


# The Passenger App

- Request, modify, & delete a ride request
- View the current location of the assigned driver as well as your pickup location
- [https://youtu.be/-u\\_jigPjROs](https://youtu.be/-u_jigPjROs)



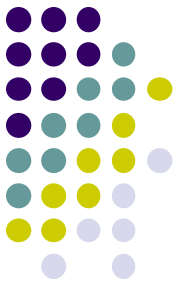




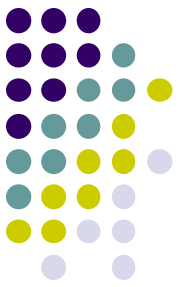
# Implementation Details

- Fine location tracking
- Location Service
- Google Maps API
- Volley
  - Android networking library
  - HTTP requests

# Results

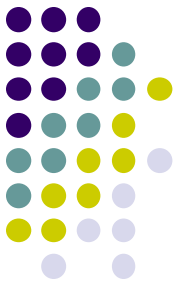


- Good
  - Driver: List of locations and map view
  - Passenger: Viewing driver locations
- Bad
  - Driver: Directions to pickup and dropoff locations
- Ugly
  - Reliance on the server



# Future Work

- More visually appealing UI for both apps.
- Survey for places that users get shuttles from so that users can put in predefined names instead of full addresses (i.e. “Fuller Labs”, “Library”).
- Estimated time of driver’s arrival for passengers, and a notification to the phone when they arrive if the app is in the background.
- App determines the best route for a driver to take to get to a destination, saving time so that passengers do not have to wait as long.



# References

- <https://www.wpi.edu/student-experience/resources/safety/campus-transportation/student-night-assistance-patrol>
- <http://www.pewinternet.org/2016/05/19/on-demand-ride-hailing-apps/>
- <http://www.dynamicridesharing.org>