ParkiTech: A Parking Lot Recommendation System

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Background and Purpose

- Difficult to find parking spots in San Francisco city areas
- Build a website to recommend available parking spots nearby to drivers. Users can customize the recommendation based on their preference.
  - shortest walk distance
  - Lowest cost
  - Most guaranteed availability

Previous Products

- ParkMobile and Parkopedia
  - No indication of availability

- Google Maps
  - Vague indication of busy hours
  - Only off-street parking

Innovation

- Parking Spot Prediction
  - We make an accurate prediction for the available parking space for busy time and spots without real-time data
- Recommendations
  - We also recommend on-street parking lots
  - Customers can customize preference settings to filter the best recommendation

Evaluation

- Prediction evaluation: Cross-Validation
  - L2-distance between real number of available spots and predicted available spots, street-wise and region-wise
- Software test
  - Generate virtual users in different locations
  - Provide service and collect feedback

Impact and Risk

- Impact
  - Driver: Find available parking spots
  - City Planner: Adjust the infrastructure layout
- Risk
  - Incidental events
  - Incorrect recommendations

Timeline and Costs

- Cost
  - Web server rental
  - Poster printing
- Timeline

Task	Week	People (abbr.)
Data acquisition and clean	1, 2	JZ, YC
Construction of website prototype	1, 2	TW
Data visualization over city map	2, 3	TW, YZ
Prediction model design	3, 4, 5	YW, JZ, YC
Tradeoff quantization	3, 4, 5	YZ, JZ, YC
Assembly of models and website	6	YW, TW, JZ
Website overall test	6, 7	All

Goals

- Midterm Goal (Front end)
  - Data acquisition and clean
  - Construction of website prototype
  - Prediction model design
  - Data visualization over the map of SF
- Final Goal (Mathematical models)
  - Risk-distance-cost tradeoff quantization
  - Assembly of mathematical models and website prototype
  - Website overall test

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