

Parking patterns in SUTD

A “2D” project in collaboration with ESD subjects: Operations Management and Statistics

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Question


- Are there any spatial patterns in where people park their cars in SUTD?
 - Profile of drivers vs profile of cars vs location of parking
 - Parking hours
- Are there any temporal patterns in occupied parking lots in SUTD?
 - Season vs Non-season
 - Potential clustering



Methods



- Time study analysis of the carpark
 - Hourly from 8 am to 11 pm, on selected weekdays
- Data collected from above analysis includes:

Data	Description	Data type	Example
Brand of car	The brand of the car that is parked in the lot. Common car brands will be available for the data collector to select for faster data entry. If car brand is not in the list, then the data collector can add a new brand to the list.	Nominal, string	"Toyota", "Kia"
HDB Season Parking 	Whether or not a HDB season parking label (shown on the left) is present on the car. This will be used to infer if the car owner lives in public housing.	Interval, binary variable	1 if label is present, 0 otherwise
Direction the car is parked	Whether the car is parked with its front facing into the lot or if its rear is facing into the lot. This will be used to find patterns in parking behaviors. <i>"If you see the front of the car, it is 1. 0 otherwise"</i>	Interval, binary variable	1 if car is backed in, 0 otherwise



Data



For each lot we collected the following information:

- Attributes of each lot
 - Season vs non-season, EV parking only, parking for the disabled
- Attributes of car parked at each lot (as listed in the previous slide)

Date	Time	Lot no.	Brand	HDB or not (1=yes, 0=no)	Parking Direction
06/04/2016	13:00	1	Toyota	0	Front
06/04/2016	13:00	2			
06/04/2016	13:00	3	Toyota	0	Front
06/04/2016	13:00	4			
06/04/2016	13:00	5	Hyundai	0	Front
06/04/2016	13:00	6	Kia	1	Rear
06/04/2016	13:00	7	Honda	1	Front
06/04/2016	13:00	8	Renault	1	Front



Analysis

We did the following analysis:

- The average proportion of time that lot was occupied over observation days (working hours: 8am-6pm, whole day 8am-11pm)
- The most common car brand type observed at each lot over the observation days (classified by country of origin)
- Analyse patterns in how people park their cars (front vs rear)
- Distance from each lot to the nearest lift lobby



Visualizations



Most Common Car Brands

by Country
with Building Outlines





Visualizations



Most Common Car Brands by Country



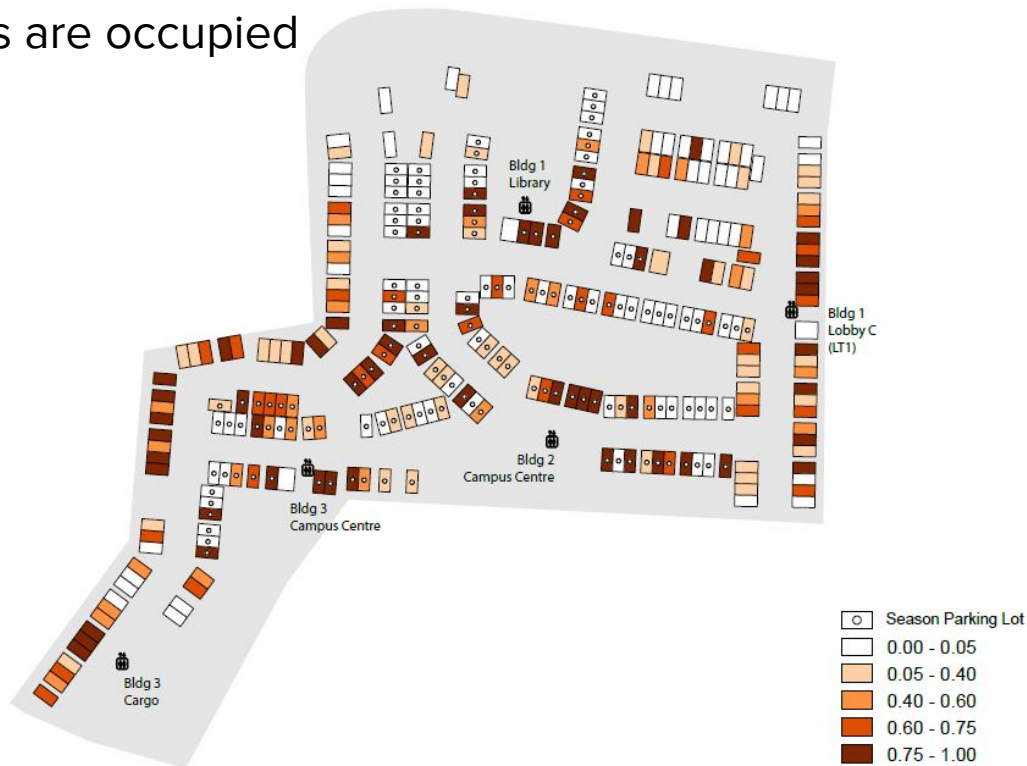


Visualizations



Proportion of time lots are occupied

5 Apr, 8am - 6pm

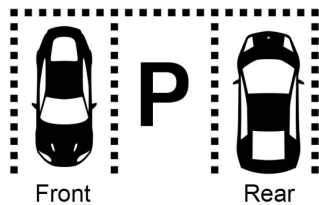




Visualizations



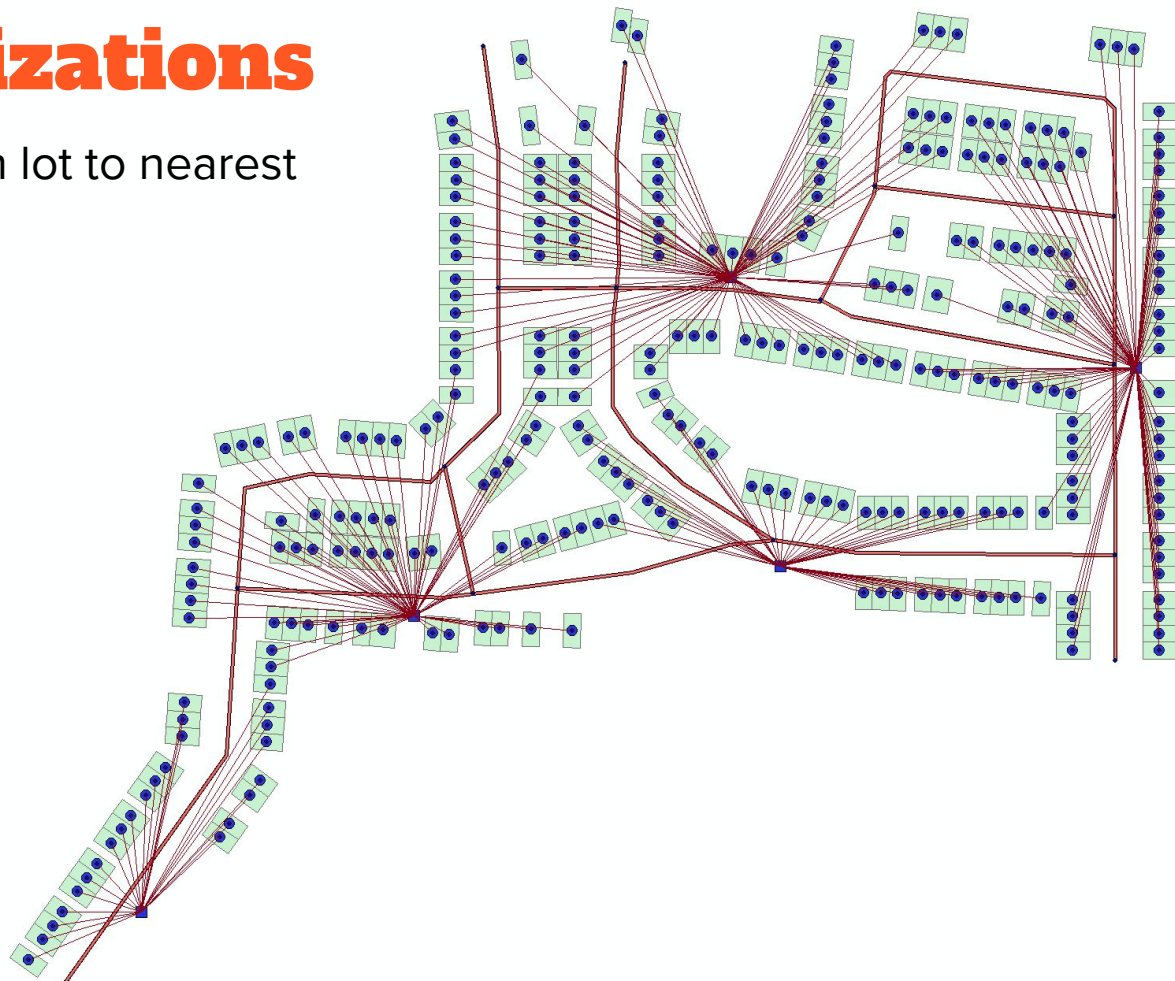
Front-Rear Parking Tendency





Visualizations

Distance from lot to nearest
lift lobby





Work-in-progress

- Average occupancy rates across all days
- Weighted overlay of indexes to determine “best parking lots”
 - Including distance to lift lobby, average occupancy rates

The end



We've come to the end of our presentation.
Any questions for us?

