

Satellite Imagery & Foot Traffic Analysis

Reomnify

Austin Ulfers

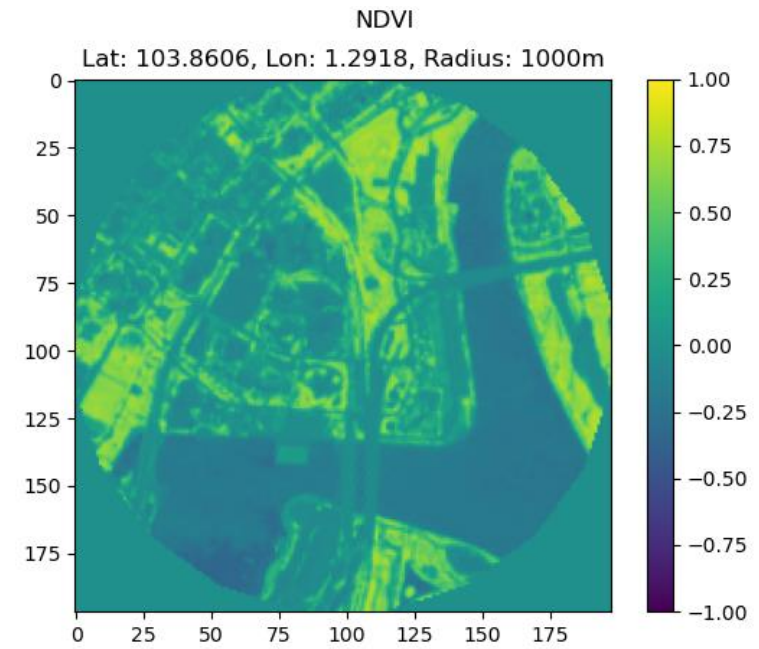
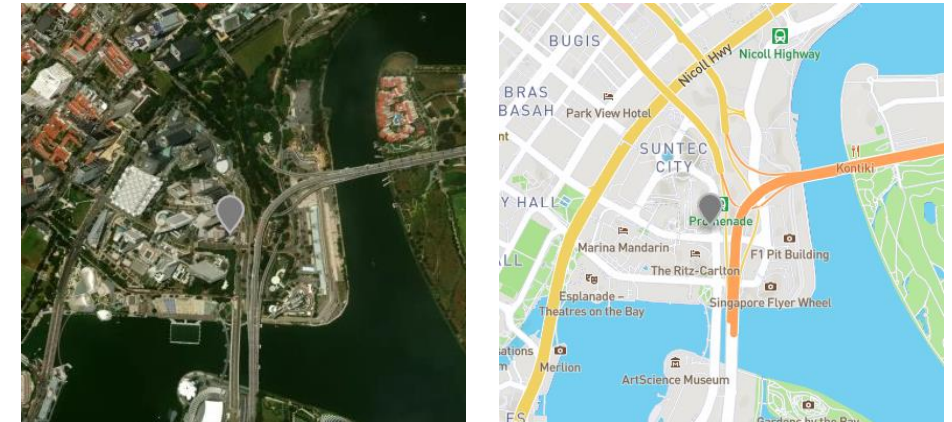
B.S. Informatics

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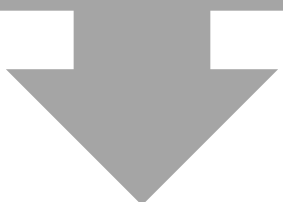
Geographic Feature Indexing

- **Problem:** Given a radial area anywhere in the world, can we develop an index for water & forested area within that area utilizing satellite imagery?
- **Procedure:**
 1. Retrieve satellite imagery from public API
 2. Extract information to calculate the NDVI (forestry index)
 3. Mask imagery to desired radial area.



Mall Popularity Using Consumer Device Tracking

Problem: Can we effectively determine the popularity of shopping malls by grouping cell phone pings from devices across Singapore?



Procedure:

Determine target's (shopping malls) building footprint polygons.

Remove any GPS spikes and outlying locations.

Cluster groups of GPS locations together to represent a single "visit" to a location.

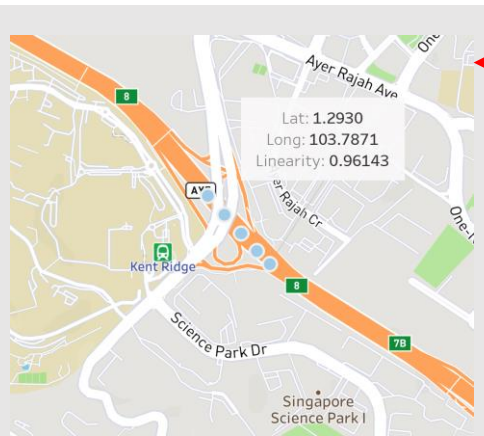
Remove clusters that are highly linearly related (driving in a straight line).

Match cluster visits to building footprints polygons.

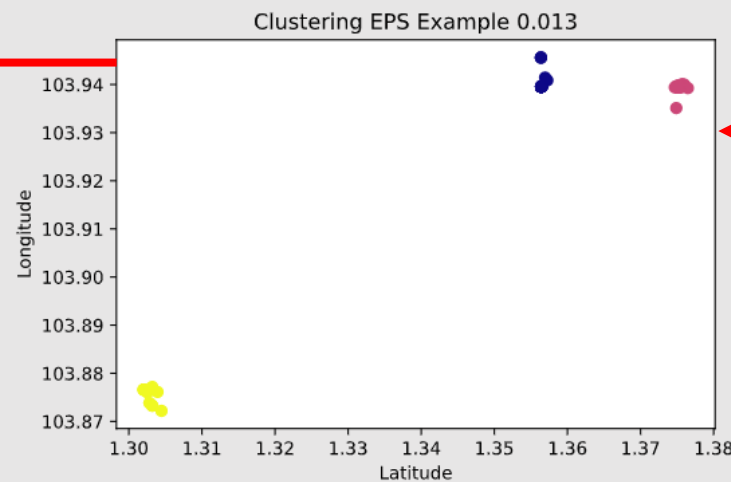
Visualize popular shopping malls.

Procedure Visualized

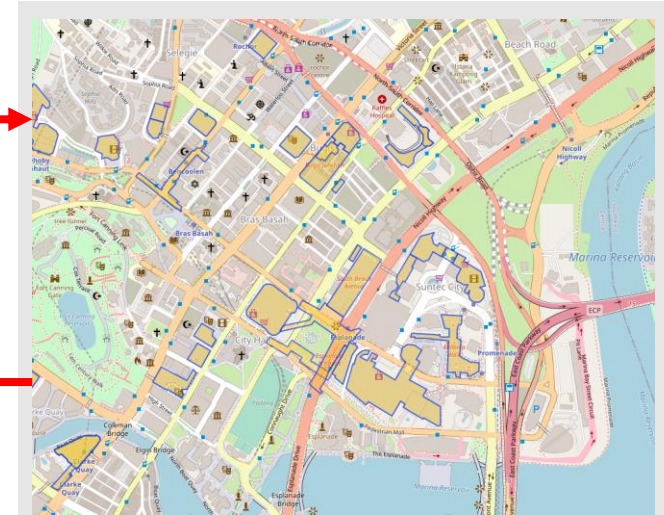
id	lat	long	height	unix	id_type	os
2 40f10b18-ee11-4714-90ae-1e8b7d2baddf	1.356431	103.9396	27.077	1569963058	aaaid	Android
3 42b2b739-6dfe-4a03-be1f-4fad0a336e28	1.308262	103.7732	30.279	1569893370	aaaid	Android
4 d6567dd4-2256-4a8b-a67f-49b76fb19e55	1.273783	103.8091	17.899	1569893691	aaaid	Android
5 820b58c5-3b09-45f2-8757-d52608f8a7b3	1.35294	103.7258	17.894	1569893378	aaaid	Android
6 42b2b739-6dfe-4a03-be1f-4fad0a336e28	1.308262	103.7732	30.279	1569893365	aaaid	Android



A cluster that gets filtered out due to driving/high linearity.



A single device visiting three different locations.



Building footprints of shopping centers in Singapore.

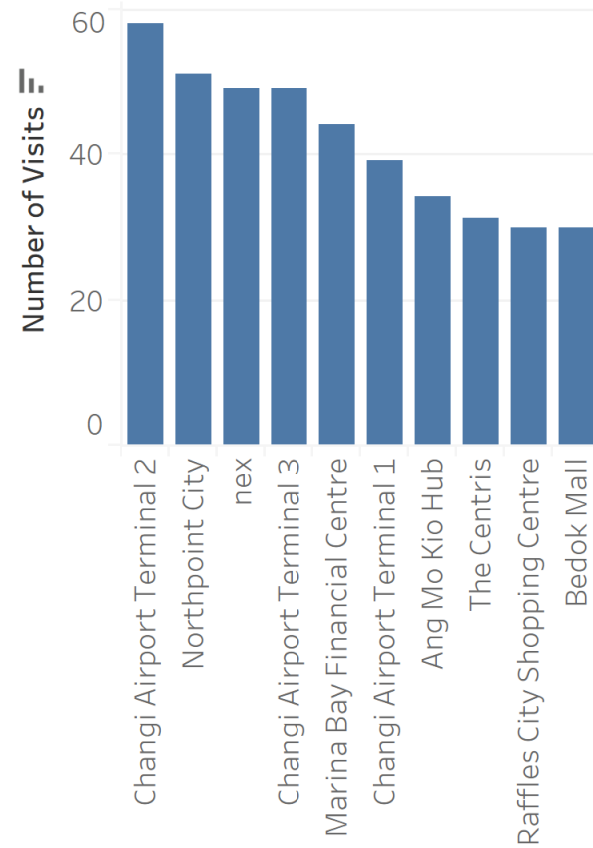
Count of Visits

Count of Building Name	1,511
Count of Id	27,207

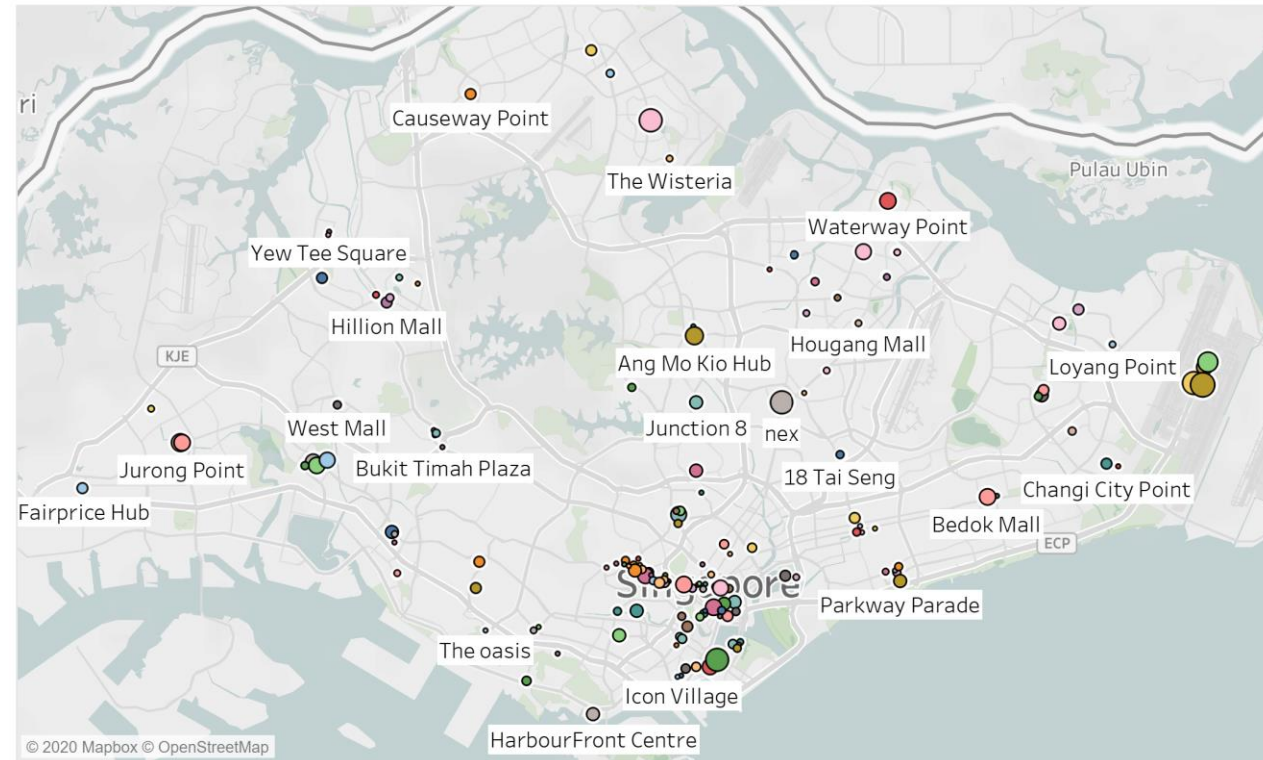
Roughly 5.55% of the visits within this dataset were in attendance of a shopping mall.

Findings

Most Popular Malls



Popular Malls Geo



CNT(y2019b1_export.csv)

- 1
- 20
- 40
- 58