



Semantic Signatures: Place Differentiation

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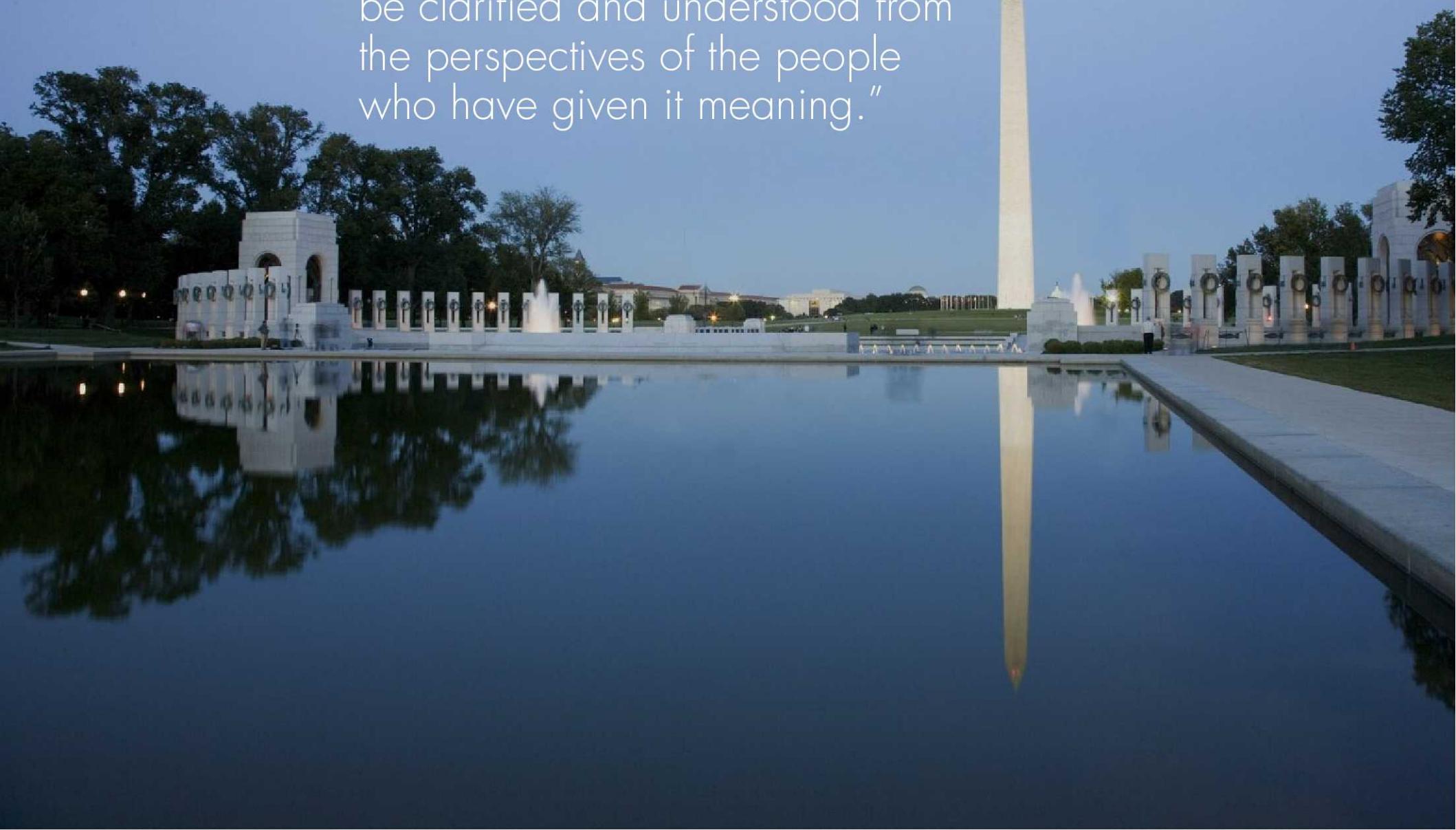
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A photograph of the Washington Monument and the National World War II Memorial at dusk. The sky is a clear, pale blue. In the foreground, a large, dark reflecting pool occupies the lower half of the frame, perfectly mirroring the structures above. On the left, the white stone arches and columns of the National World War II Memorial are visible, along with a series of small fountains. To the right stands the tall, slender Washington Monument. In the background, the U.S. Capitol building and the Jefferson Memorial are faintly visible across the grassy mall.

Place

"Place is a 'special ensemble'; it has a history and meaning. Place incarnates the experiences and aspirations of people. Place is not only a fact to be explained in the broader frame of space, but it is also a reality to be clarified and understood from the perspectives of the people who have given it meaning."



Representing Geographic Data

A *Geo-Atom* is defined as an association between a point location in space–time and a property.



Representing Geographic Data

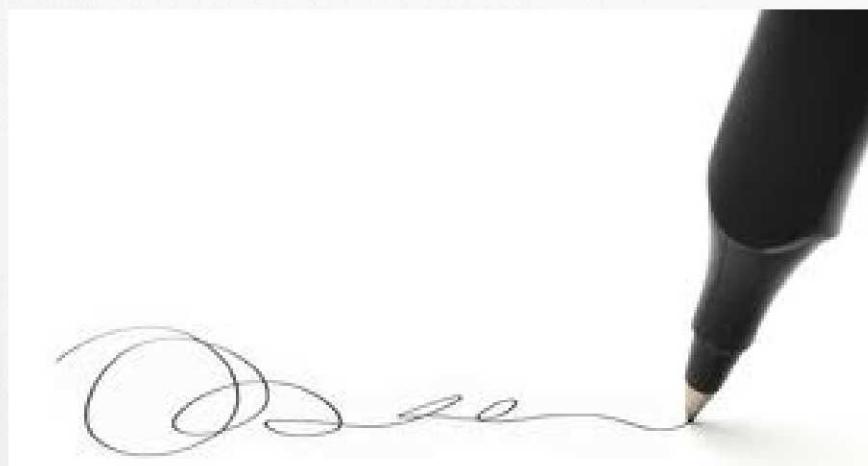
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< geographic space (x, y, z), time (t), theme (a) >

Signatures

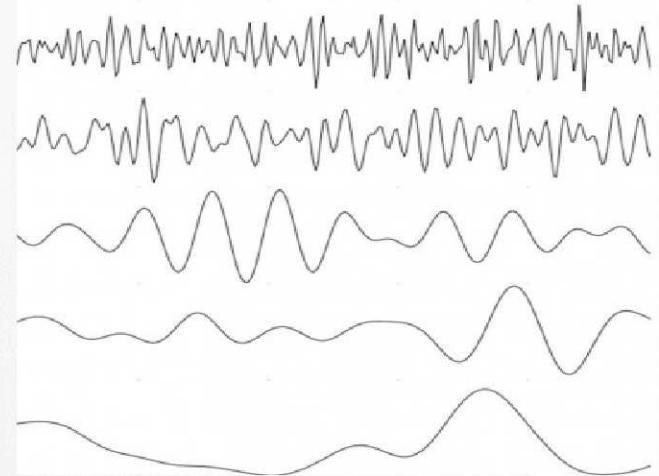
Autograph



Fingerprint



Brain Waves



Tree Rings

Spectral Signatures

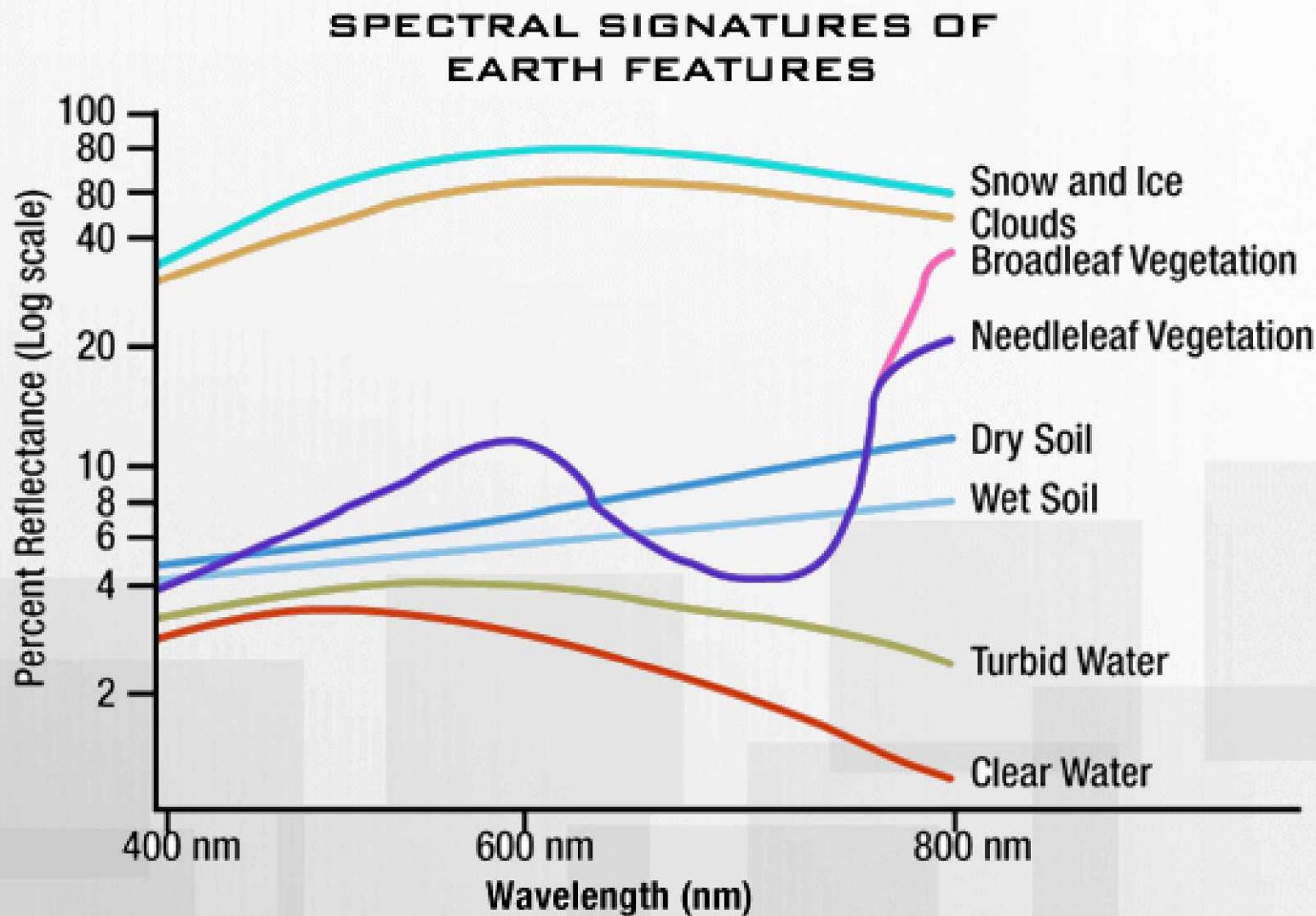
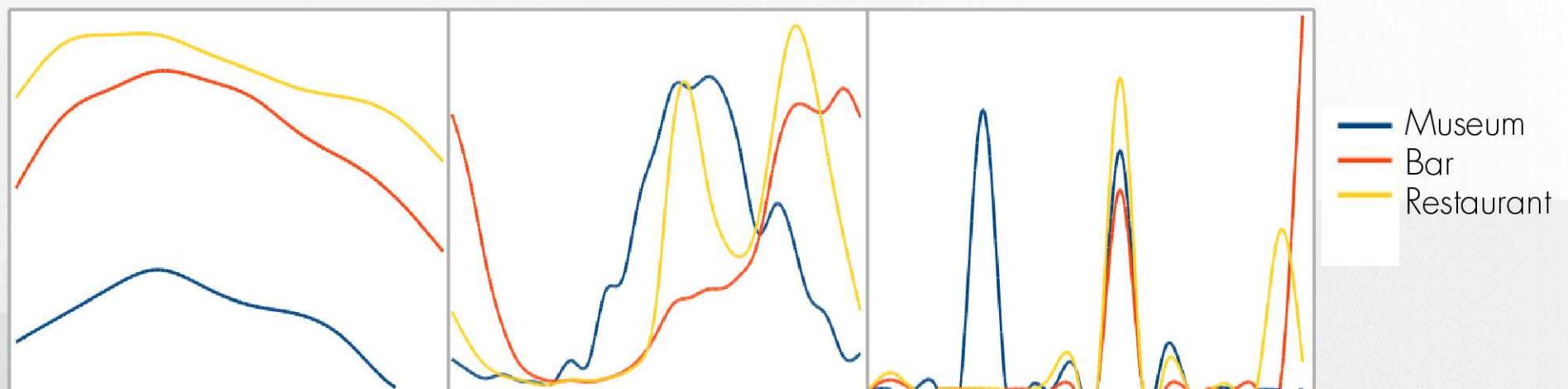


Figure: Jeannie Allen, NASA.gov

Signatures

Semantic Signatures



Spatial Bands



Temporal Bands



Thematic Bands



Spectral Signatures

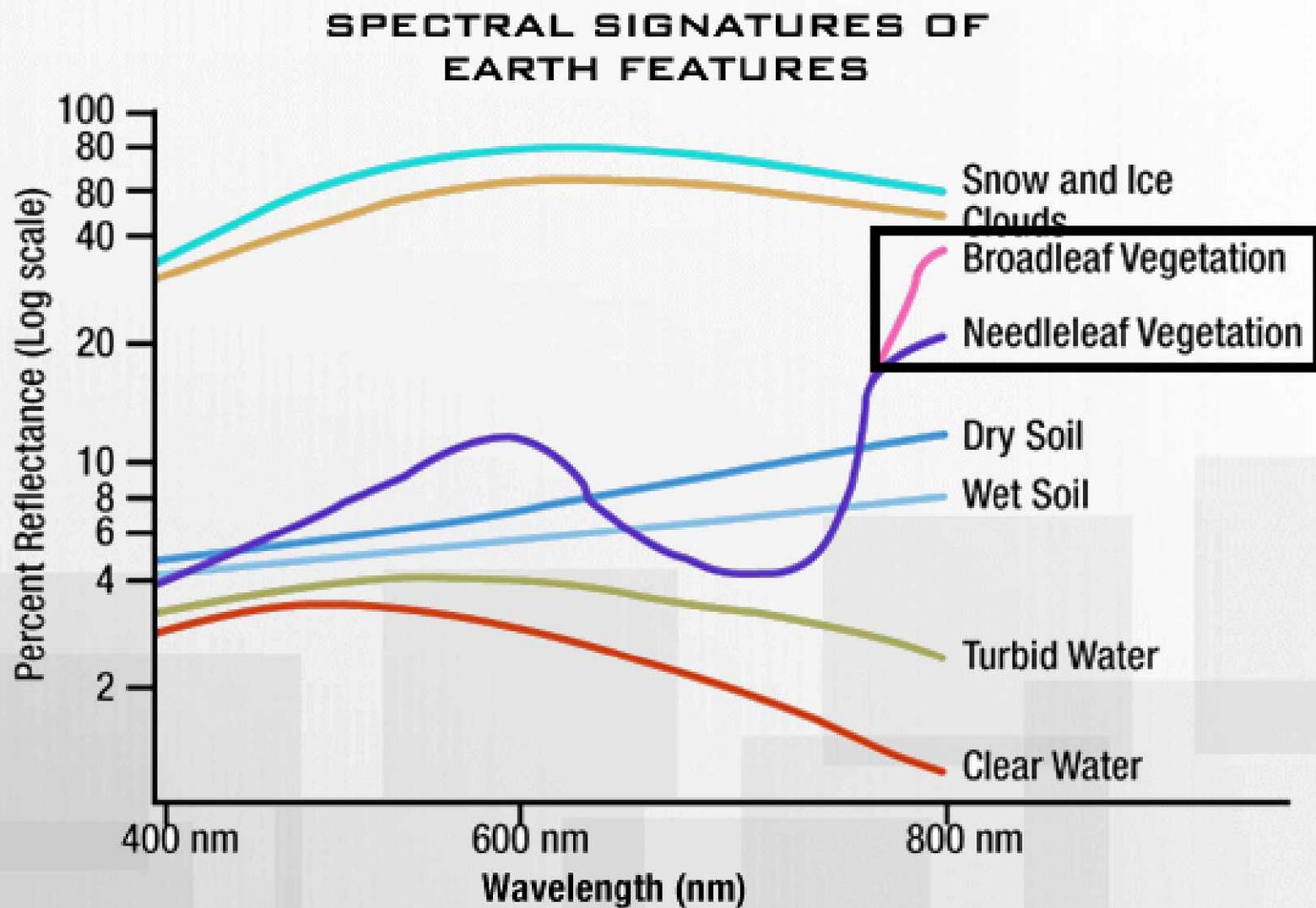
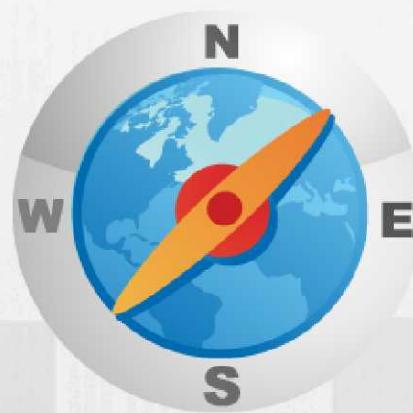
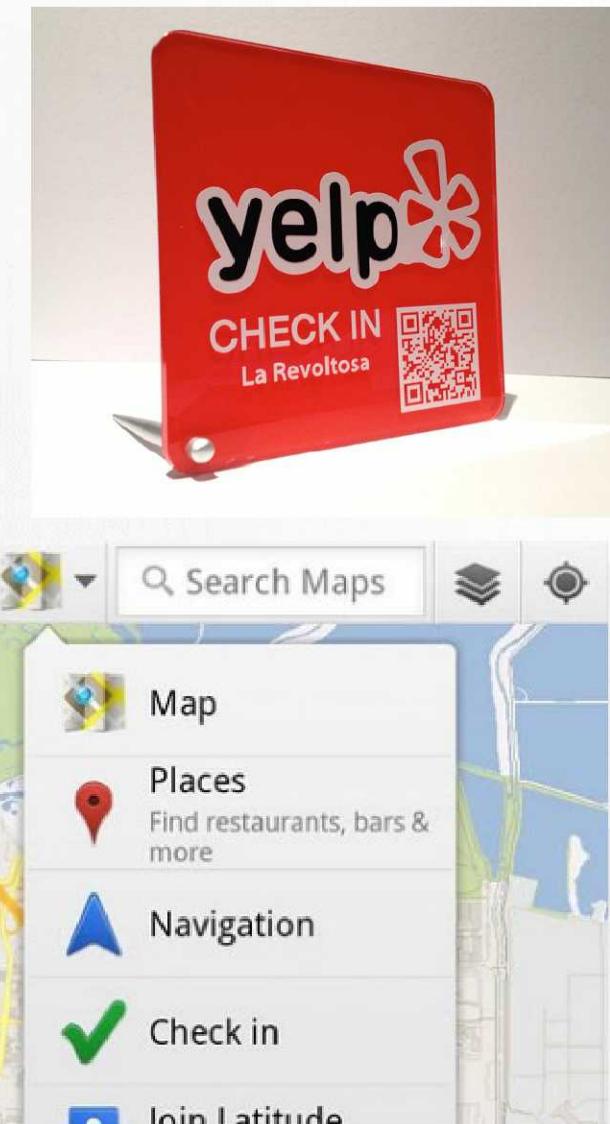
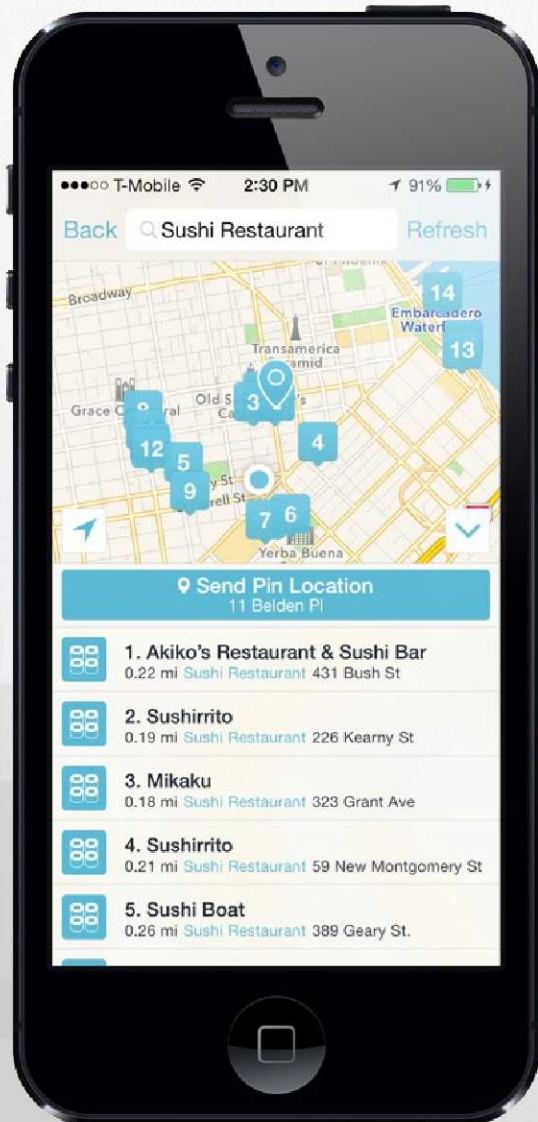


Figure: Jeannie Allen, NASA.gov



Check-Ins

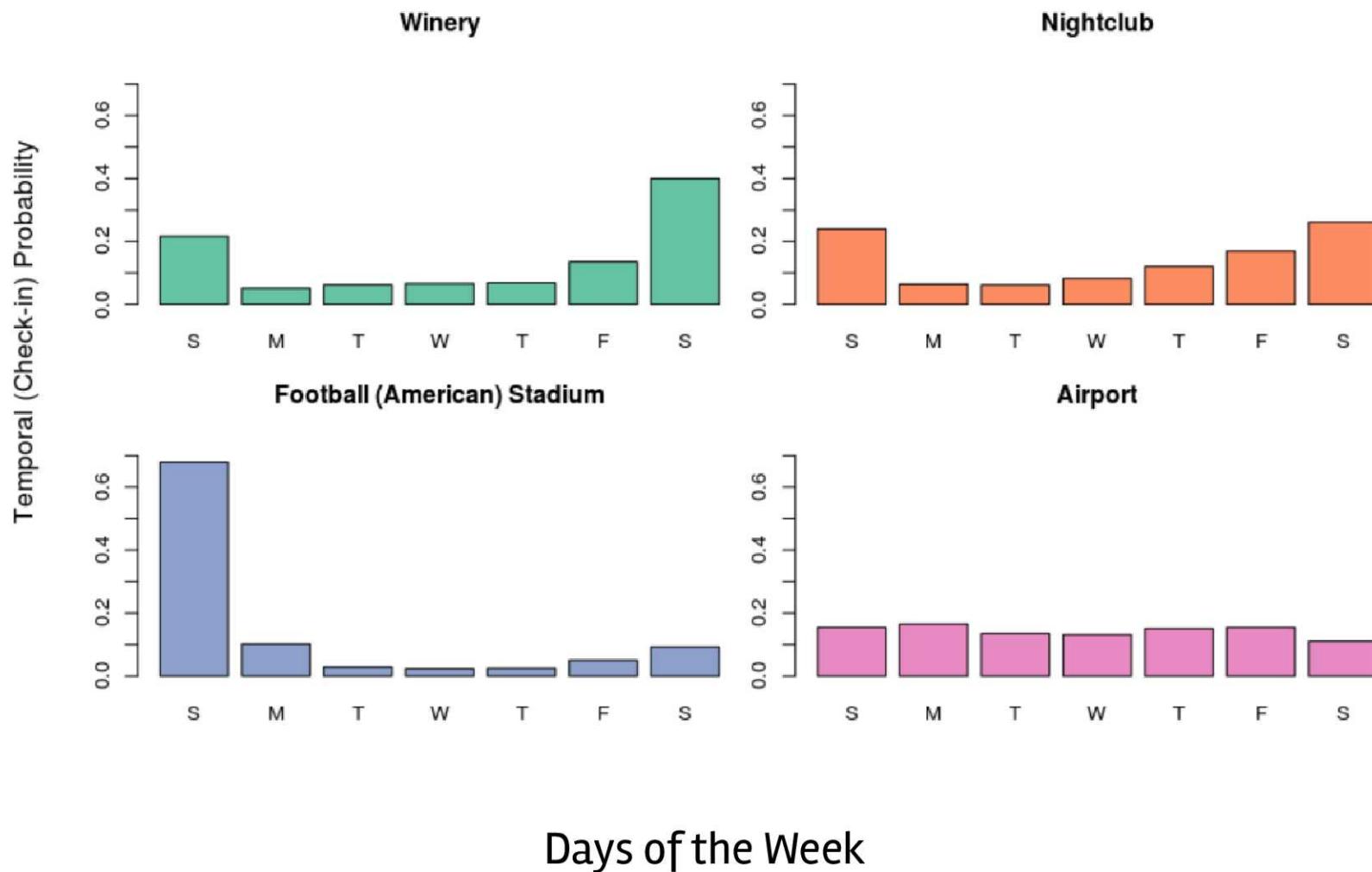


Check-Ins

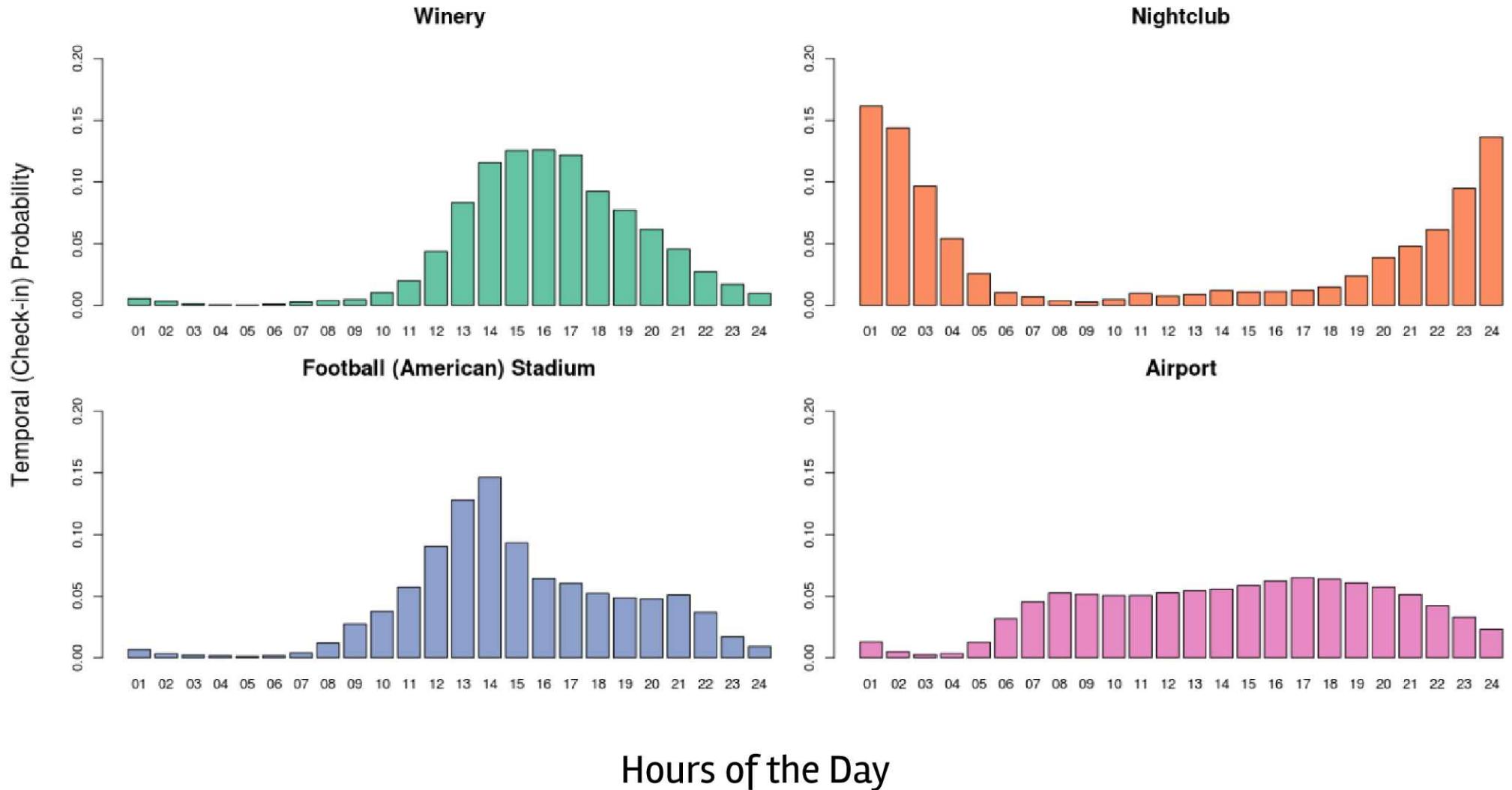


10 Billion Foursquare Check-ins

Temporal Bands

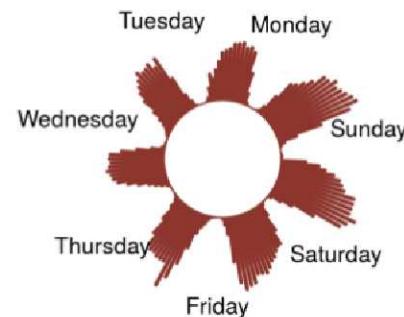


Temporal Bands

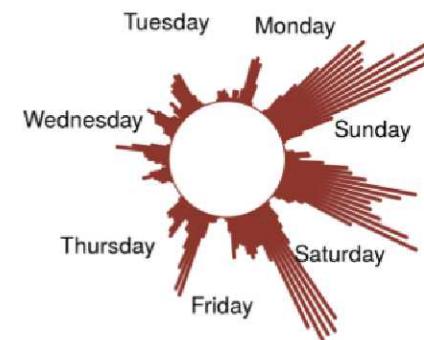


Temporally-Enhanced Reverse Geocoding

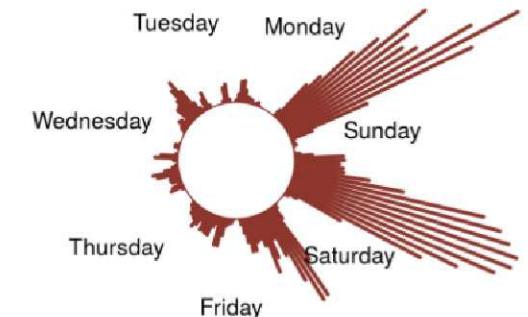
Theme
Parks



(a) Los Angeles

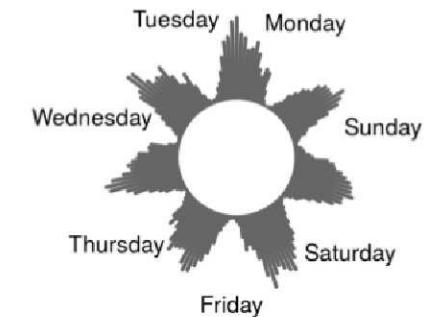
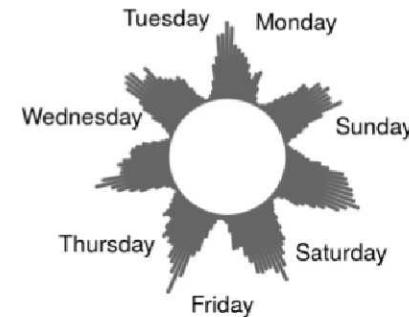
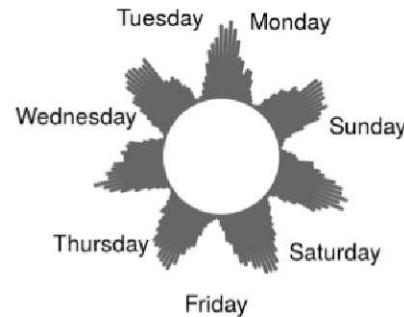


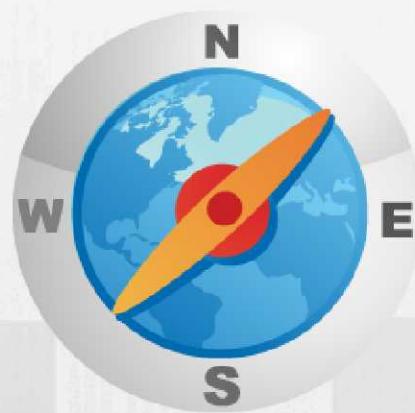
(b) Chicago



(c) New York

Drugstores





Thematic Bands



Redskins Rally location: \$2 Domesticos on Game Day
Washington Redskins - December 16, 2011

Save Like - 13 likes



Best drink deals around!!!
Allison Kuchar - October 30, 2011

Save Like - 7 likes



Power Hour! also Monday night is wing night! :)
Toni Rose - November 9, 2011

Save Like - 5 likes



Honey old bay wings are awesome
Andre J - December 7, 2011

Save Like - 4 likes



Honey old bay wings are amazingly delicious!!!!
Luis Escamilla - September 9, 2013

Save Like - 3 likes



Best bartender at the best bar in CP !!!!!
Reginald Louis - March 4, 2012

Save Like - 3 likes



Christina and Brooke own the joint
Christina Julie - January 10, 2012

Save Like - 3 likes



Happy hour 2-7 is the best!
Rachael Skalamera - October 2, 2011

Save Like - 3 likes



1/7/2016

8 check-ins

The word Looney normally has a negative stigma attached to it which makes me wonder why anyone would name their establishment "Looney's..lol Okay, let's get past that and on to the more important stuff. This place is located on the bottom level of a newer University of Maryland off campus housing mid-rise so you have to pick your times when coming here or you may be surrounded by a bunch of drunken college kids. I only come during lunch hours so I'm good in that department!

This is one of the few bars/pubs that I actually go to for the food and not to watch a game and eat wings. Looney's has an incredible menu and EVERYTHING I've eaten has been spot on. I have recently discovered their Seafood bowl which is nothing short of mind blowing. The bowl has jumbo scallops, jumbo shrimp, crab chunks and lobster in an amazing Old Bay seasoned broth (\$13.99)!!! You literally want to lick the bowl when you're done. I'm not ashamed to say, I actually did that once when nobody was looking.. Lol I normally sit at the bar to take advantage of the many TV's and to kick it with the super friendly bartenders who never let your drink get past half before you're getting a refill! Now that's service!!



Thematic Bands



Redskins Rally location: \$2 Domesticos on Game Day

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Power Hour! also Monday night is wing night! :)

Toni Rose - November 9, 2011

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Honey old bay wings are awesome



Trivia night is on Mondays and it is a good time! Make sure you get there early though because tables fill up. Trivia starts at 7:30

Jessica Elmore - April 30, 2013



Best bartender at the best bar in CP !!!!!

Reginald Louis - March 4, 2012

Save Like - 3 likes



Christina and Brooke own the joint

Christina Julie - January 10, 2012

Save Like - 3 likes



Happy hour 2-7 is the best!

Rachael Skalamera - October 2, 2011

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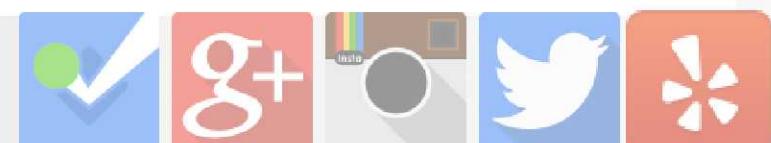


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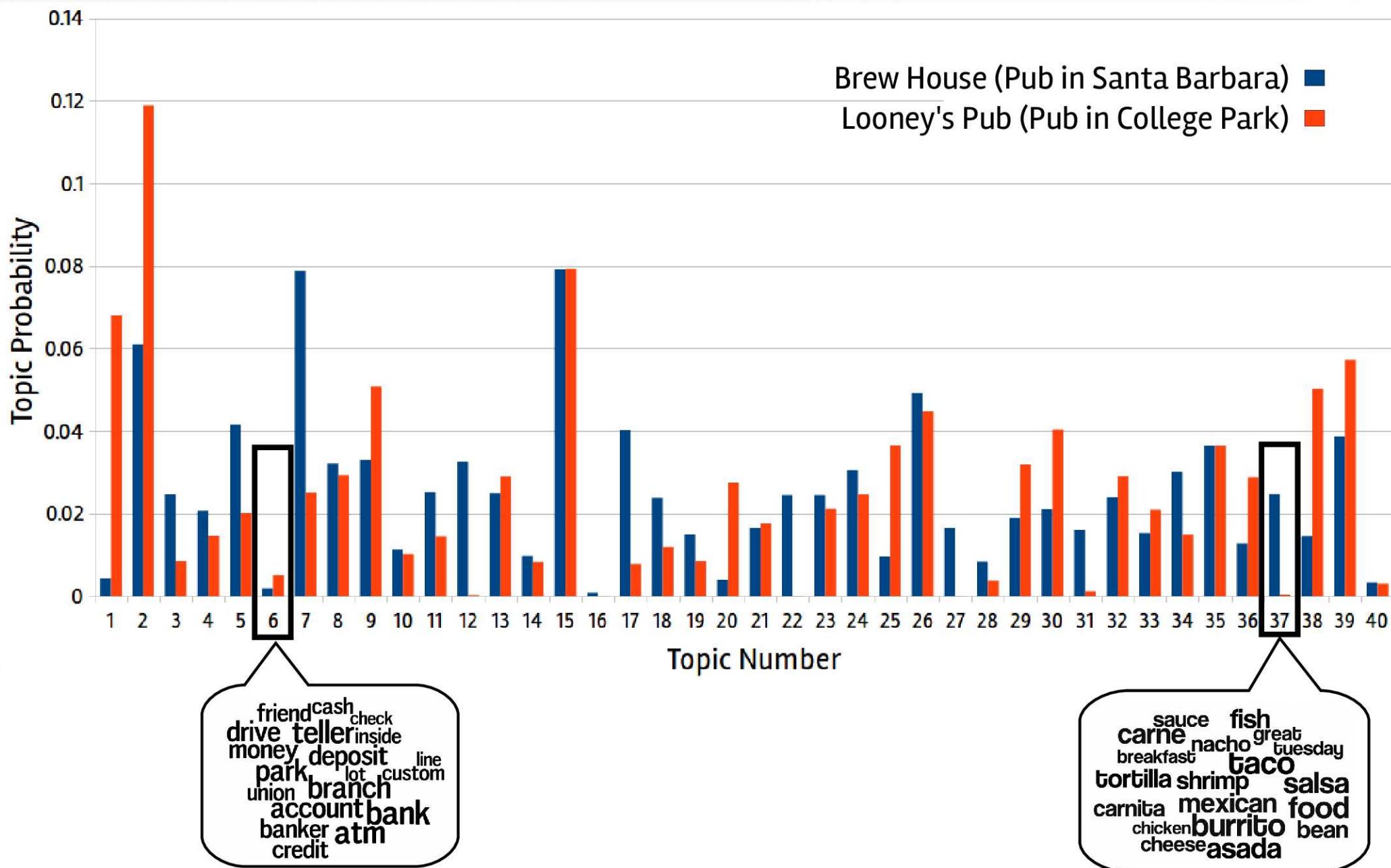
Example Topics

friend cash check
drive teller inside
money deposit line
park lot custom
union branch
account bank
banker atm
credit

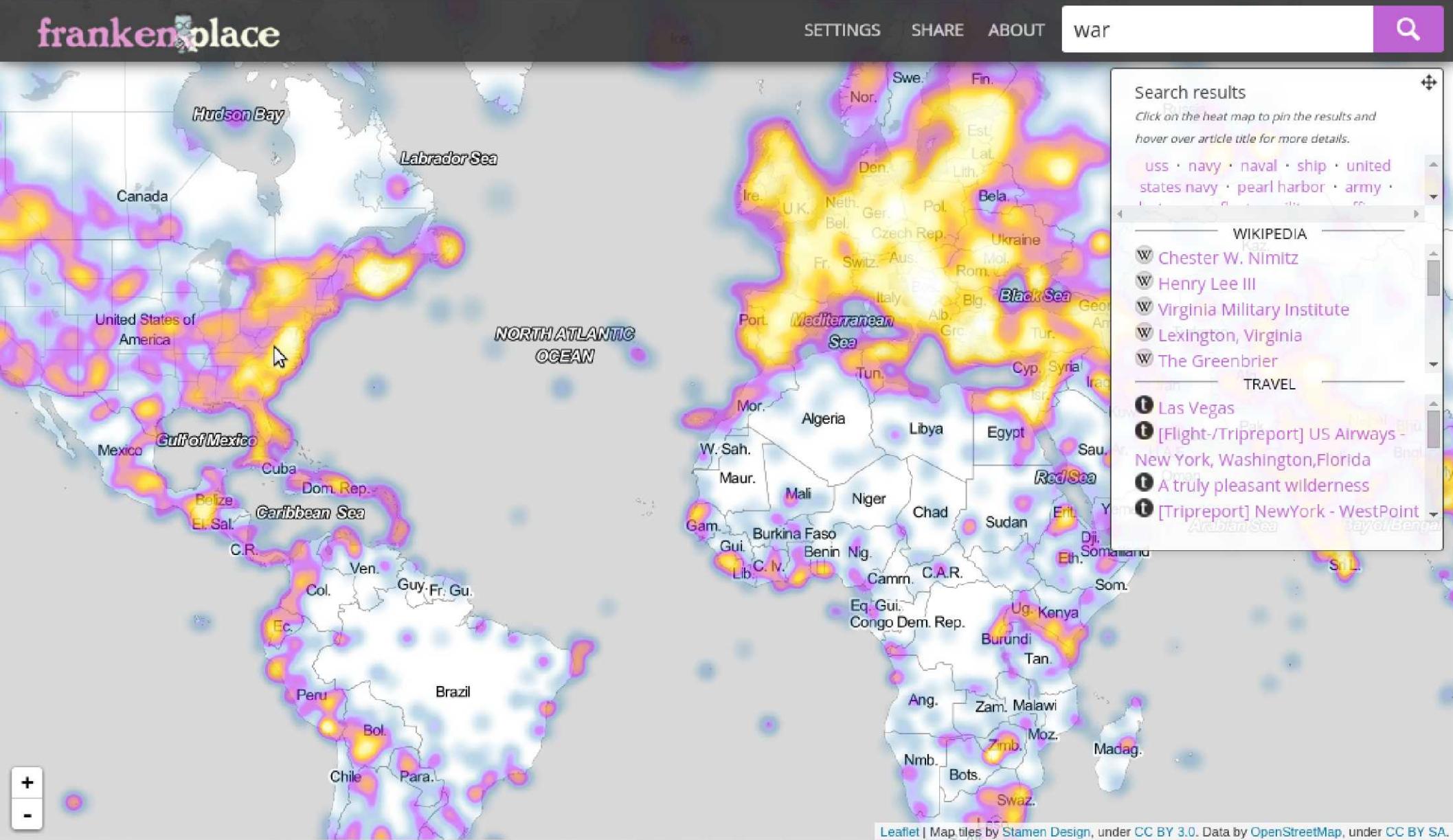
time great pretty
nice good don't work
love people really anyways
people always friend very
make super online place
back

sauce fish great
carne nacho tuesday
breakfast taco
tortilla shrimp salsa
carnita mexican food
chicken burrito bean
cheese asada

Place Similarity



Place Similarity - Search

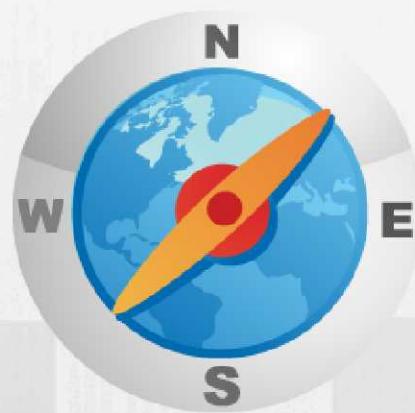


Introduction 000

Data Dimensions 000

The Urban Pulse 000

Next Steps 000

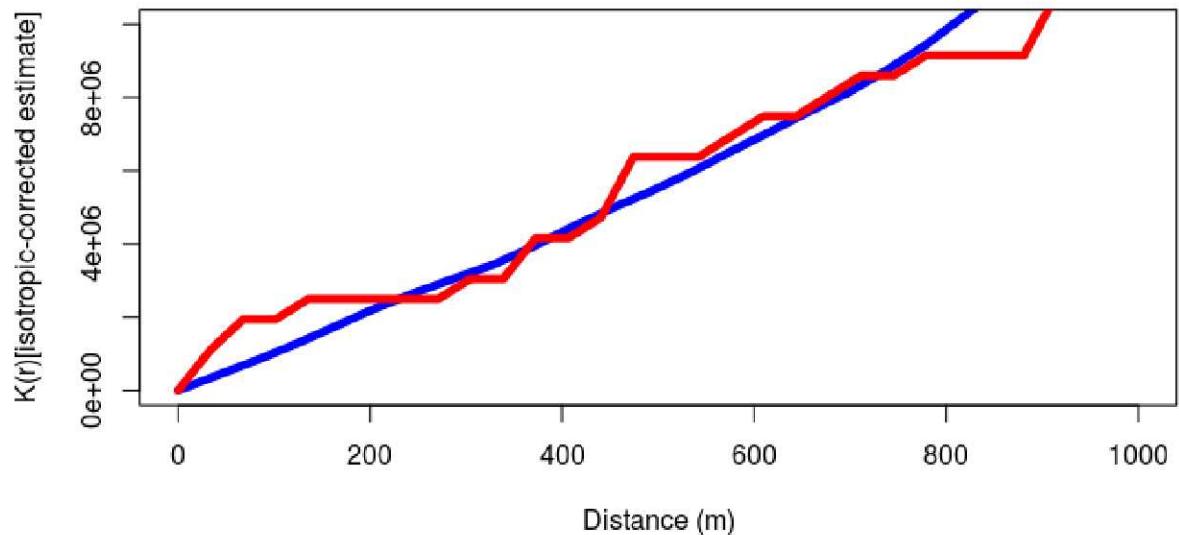


Spatial Signatures

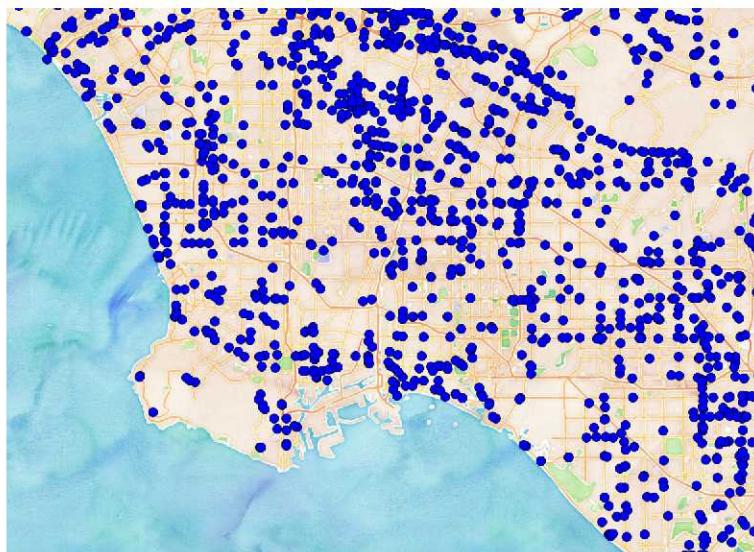
Farmers Markets



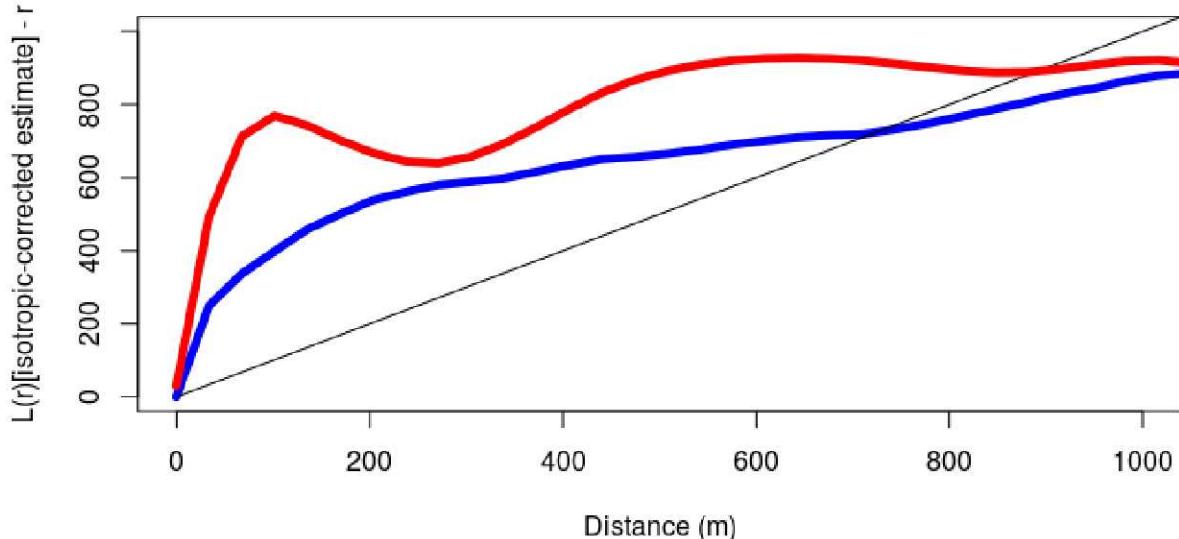
Ripley's K

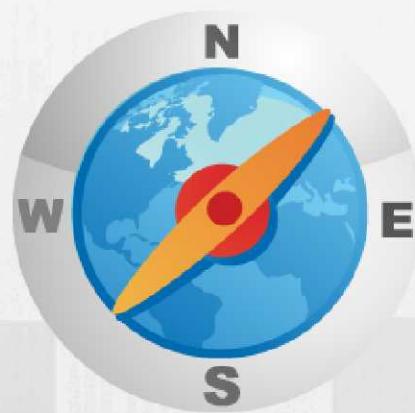


Mexican Restaurants



Ripley's L





A Behavior-driven Approach to *Place*

Goal

- Visualize the **Pulse** of a City
- Explore urban behavior through Points of Interest in the Greater Los Angeles Area every hour over the course of a week

Challenge

- Over 200,000 Points of Interest (POI)
- 421 POI Categories

How to meaningfully **visualize** so much data...
...while maintaining **interactivity**?

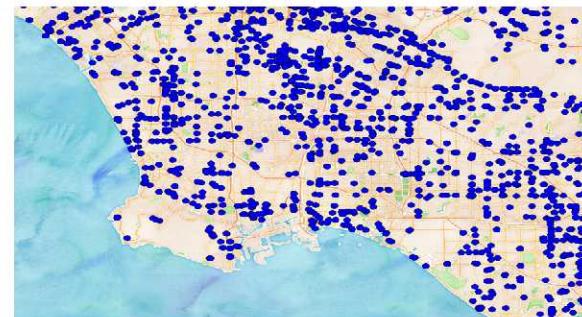
- Reduce number of categories (colors on map)
 - But How?

A Behavior-driven Approach to *Place*

Semantic Signature Extraction

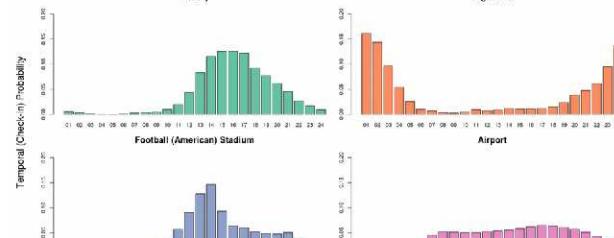
Geospatial

- 12 Bands
 - ANND (1)
 - Ripley's K Bins (10)
 - J Measure (1)
- *Based on Geographic Location*



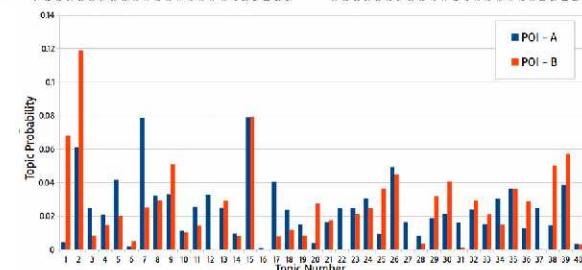
Temporal

- 168 Bands
 - 24 Hours \times 7 Days
- *Based on Check-Ins*



Thematic

- 60 Bands
 - LDA topics
- *Based on Tips*



A Behavior-driven Approach to *Place*

Band Reduction

- Reduce the number of bands to only those that contribute to classification
 - **Shannon Entropy → Information Gain**

Band Type	Rank	Information Gain
(Temp) F 11PM	1	0.772
(Temp) M 11AM	2	0.751
(Temp) Th 11AM	3	0.744
(Temp) M 12PM	4	0.725
(Temp) Su 11AM	5	0.712

Band Type	Rank	Information Gain
<i>Thematic</i>	56	0.519
<i>Spatial</i>	73	0.234
(Temp) M 5AM	240	0.034

A Behavior-driven Approach to *Place*

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A Behavior-driven Approach to *Place*



A Behavior-driven Approach to *Place*



Sports and Recreation
Football Player

A Behavior-driven Approach to *Place*



Sports and Recreation Football Player



A Behavior-driven Approach to *Place*



Attraction
Spectator

Sports and Recreation
Football Player



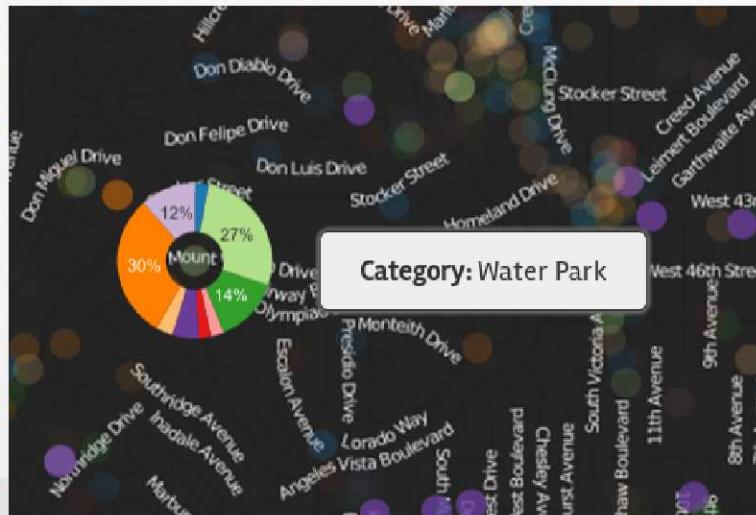
A Behavior-driven Approach to *Place*

Classification

- *Goal:* Classification of 421 categories in to 9 Parent classes
 - Existing Foursquare Classification
 - Reference Schema.org & Ordnance Survey in determining parent categories
 - Manually classify training set
- *Machine Learning (Support Vector Machine)* approach to predict Parent Level classes for remaining categories

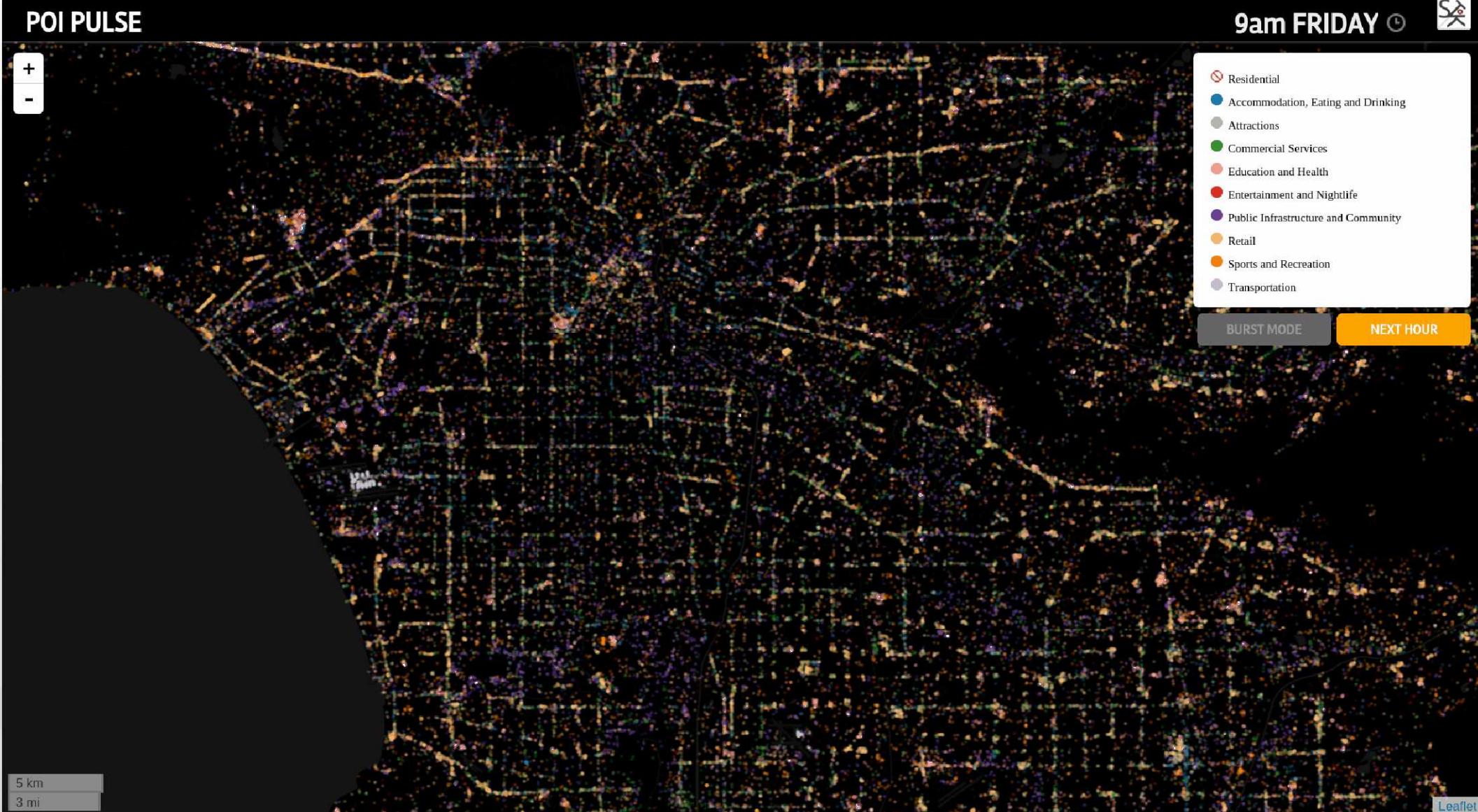
Parent Class	F Score
Accommodation, Eating & Drinking	0.83
Attractions	0.65
Commercial Services	0.59
Education & Health	0.78
Entertainment & Nightlife	0.82
Public Infrastructure & Community	0.59
Retail	0.86
Sports & Recreation	0.76
Transport	0.70

A Behavior-driven Approach to *Place*



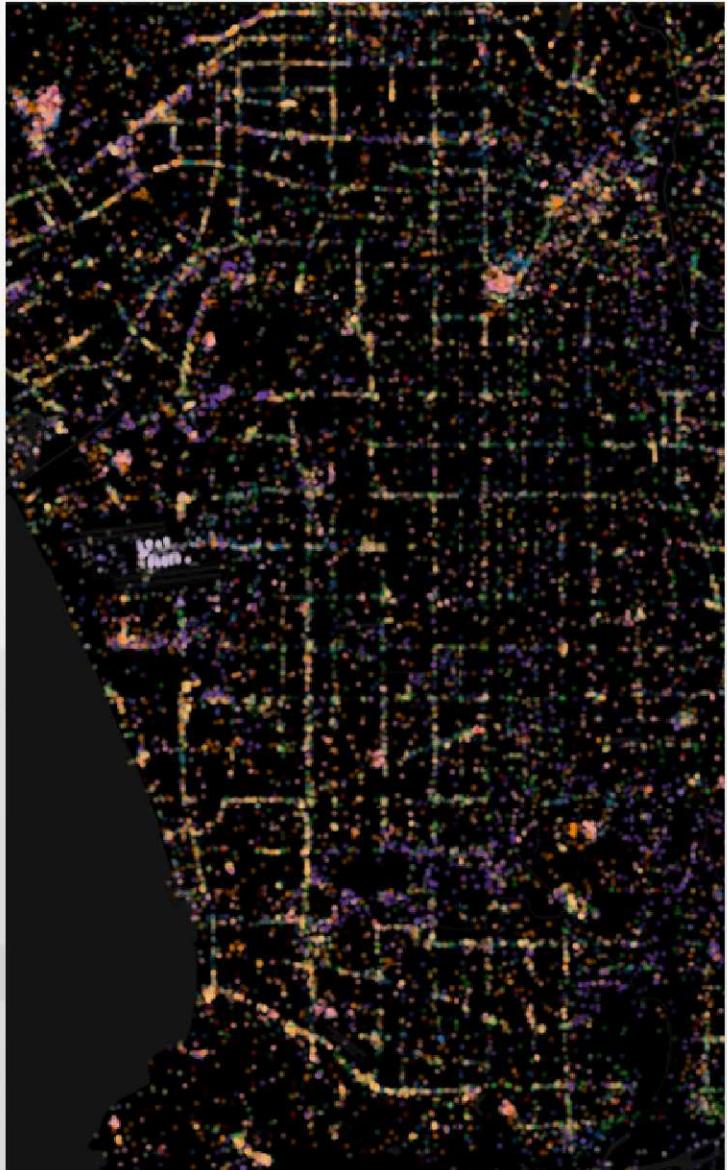
- Residential
- Accommodation, Eating and Drinking
- Attractions
- Commercial Services
- Education and Health
- Entertainment and Nightlife
- Public Infrastructure and Community
- Retail
- Sports and Recreation
- Transportation

The Urban Pulse

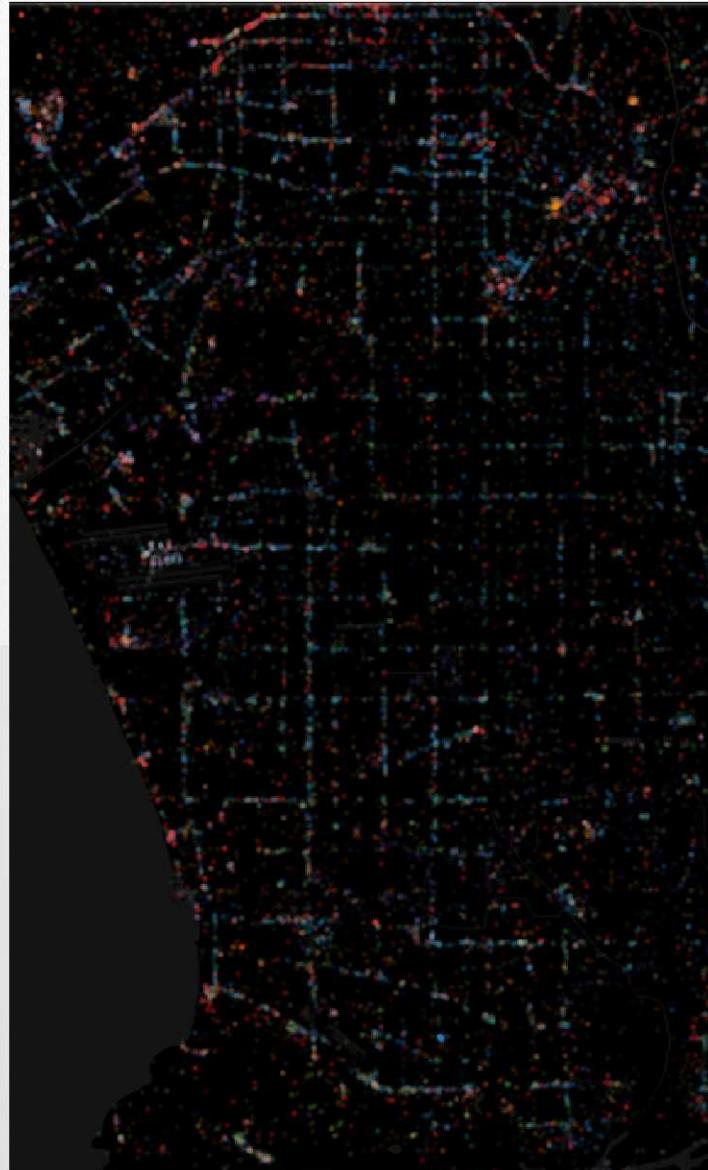


The Urban Pulse

9am Monday

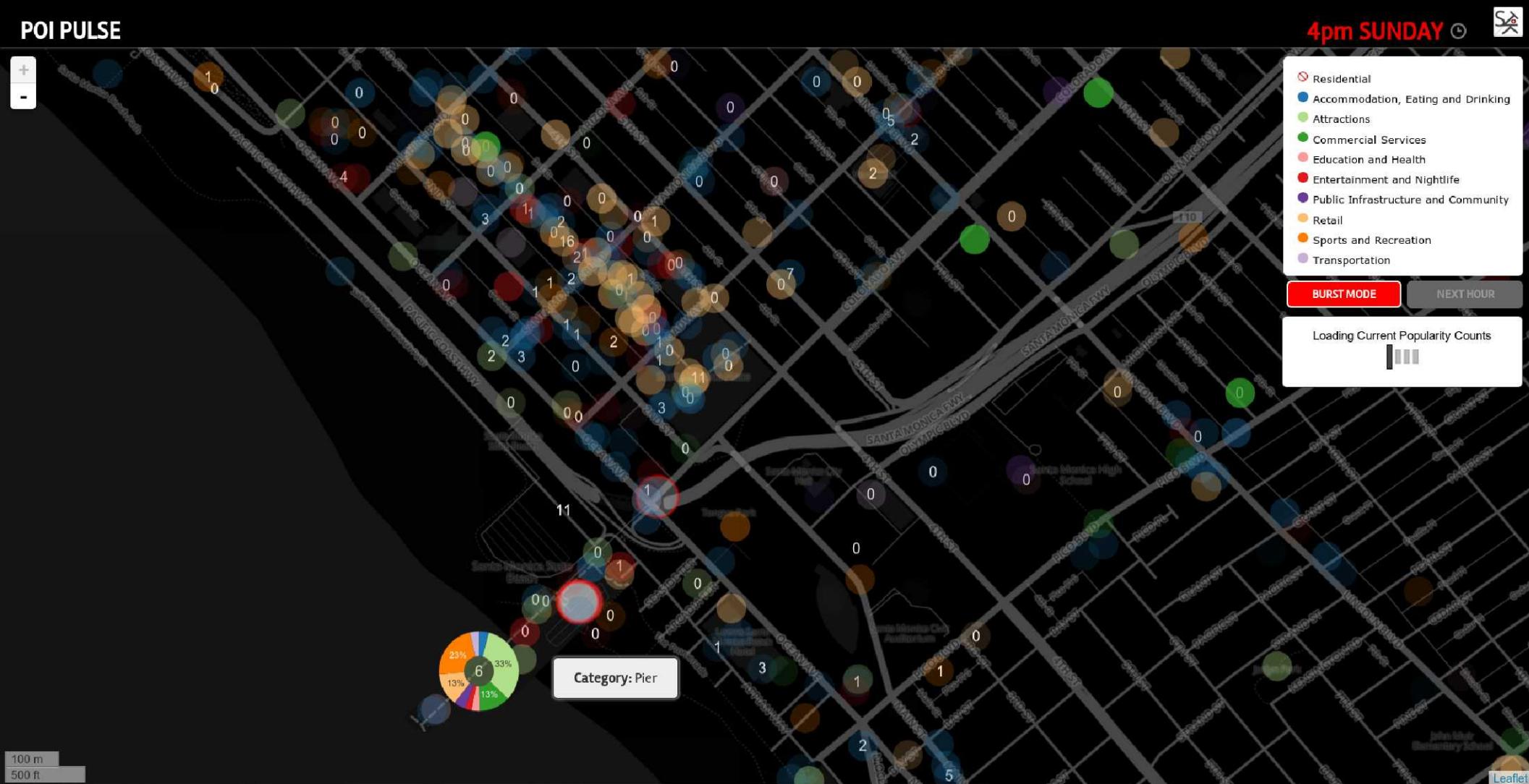


1am Saturday



- ✖ Residential
- Accommodation, Eating and Drinking
- Attractions
- Commercial Services
- Education and Health
- Entertainment and Nightlife
- Public Infrastructure and Community
- Retail
- Sports and Recreation
- Transportation

The Urban Pulse



Default Pattern Behavior vs. Real-time Dynamic Behavior



Exploring Dimensions of Place

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