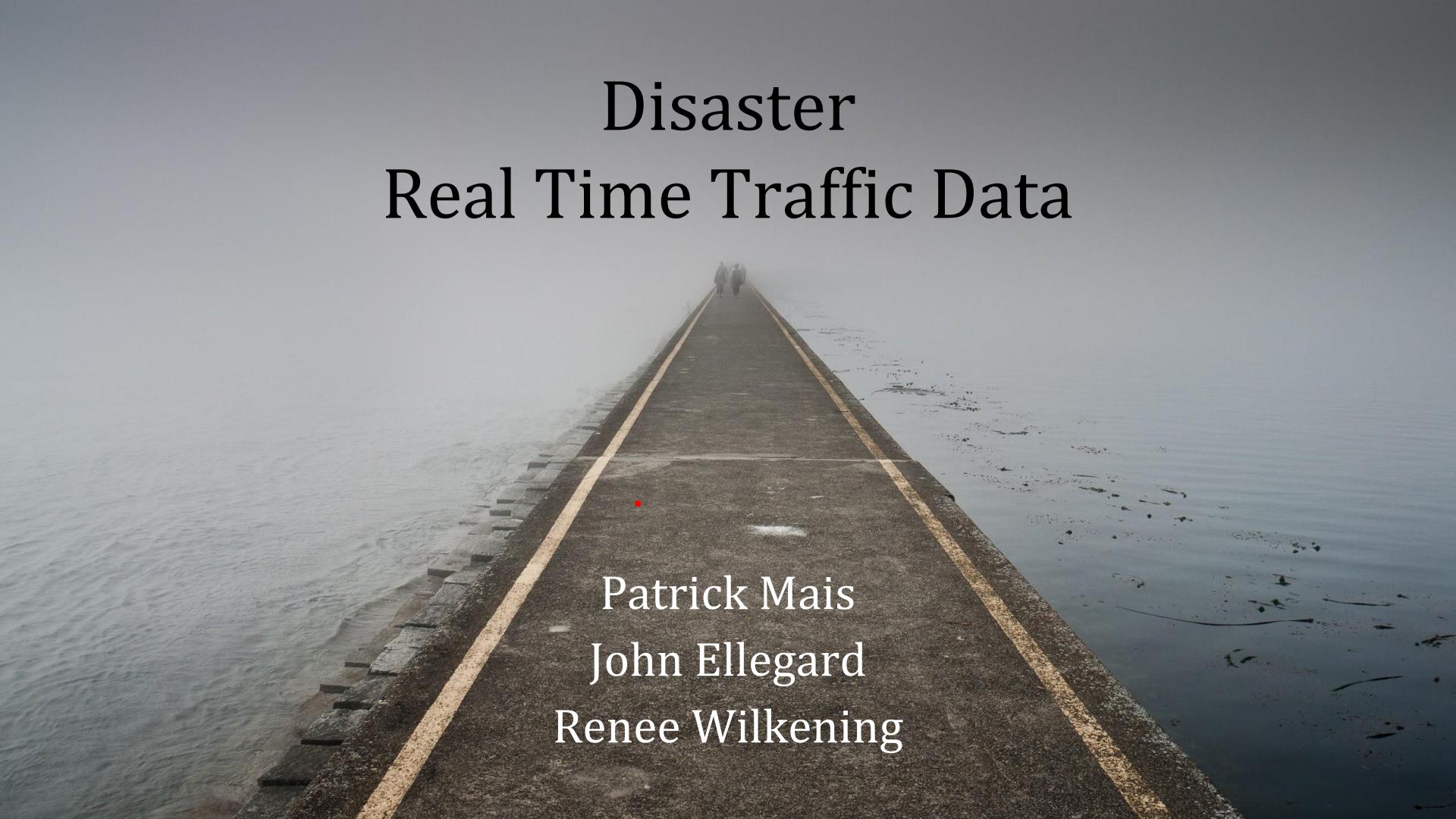


Disaster Real Time Traffic Data



Patrick Mais
John Ellegard
Renee Wilkening



Emergency Personnel
& Locals Need
Live Road Condition
Information



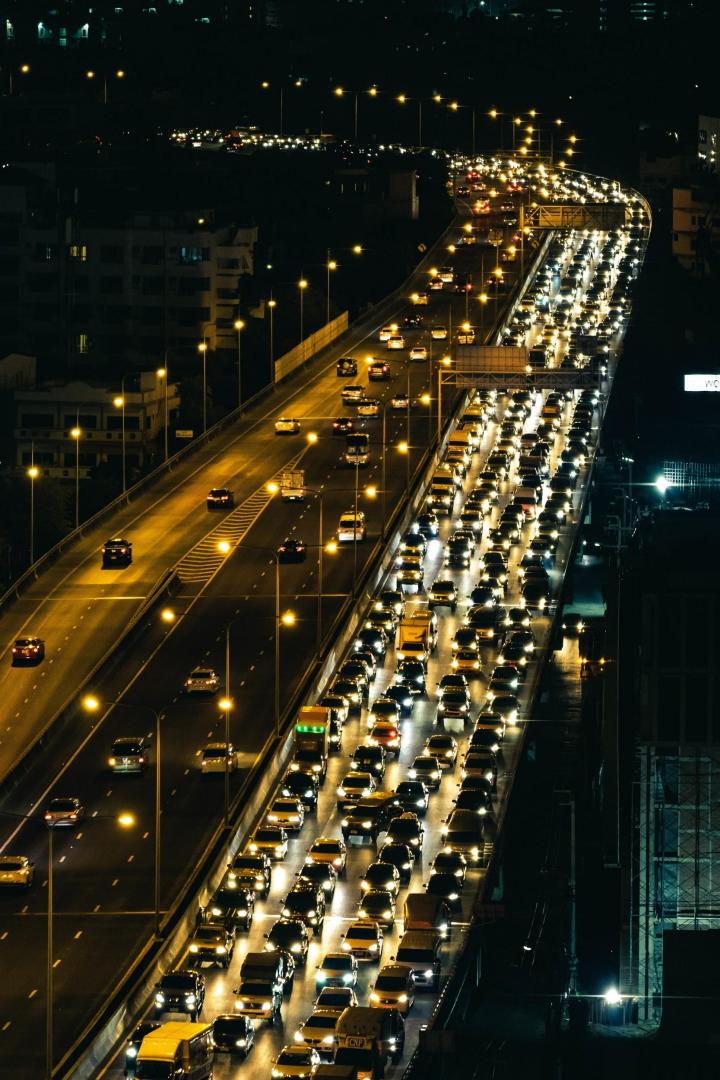
Alternatives to Traffic Apps

Twitter:

- Megasource for Live Data

Here.com

- Real Time Traffic Website



Model Training Data

Los Angeles area Wildfires of October and November of 2019.

- Saddleridge, Tick and Getty Fires:
 - Estimated Damages \$14.8 billion

- California Damages:
 - Estimated Damages \$25.4 billion

Getting the Twitter Data



Tweepy

Queries:

- Saddleridgefire
- Tickfire
- LACoFDPIO
- CaltransDist7
- SpecNews1SoCal
- LACoFD911
- tla_cla
- tla_ela
- tla_sla
- tla_wla
- tla_sdi
- TrafficNBCLA
- Go511
- KNX1070

10k
Tweets

A large, illuminated question mark sign made of wood or metal, mounted on a dark wall. The question mark is backlit with warm yellow lights, creating a glowing effect. The top curve of the question mark has five small lights, and the stem has one light at its base.

An Answer is Only as
Good as the Question

Twitter Query Suggester

- Takes in Query
- Searches Twitter
- Clean/CVEC
- Top 50 Hashtags
- Word2Vec
- Most Similar
- Then Requery

Query Suggester in Action

SaddleRidgeFire:

Containment, Hillsidefire, Porterranch, Simivalley, HillFire

Tickfire:

CanyonCountry, GranadaHills, SantacCaritaFire, Scence, WestCovinaCity

knxTraffic:

LATraffic, CaltransDist, OCTraffic, KNX, CalTransdist

LATraffic:

KNXTraffic, OCTraffic, FondoKNXTraffic, KNX, CalTransdist

GettyFire:

EasyFire, Construction, Oakfire, SandCanyon, HillSideFire

Modeling Road Closures



Determining Road Closures

Road Keywords:

road, st, rd, hwy, highway, ave, avenue, street, boulevard,
intersection, bridge, sr-, cr-, us-, i-, blvd



Closed Keywords:

closed, remains closed, shut down, backed up, no travel, delay,
blocked, delays, disabled, traffic, fire, closures, closure

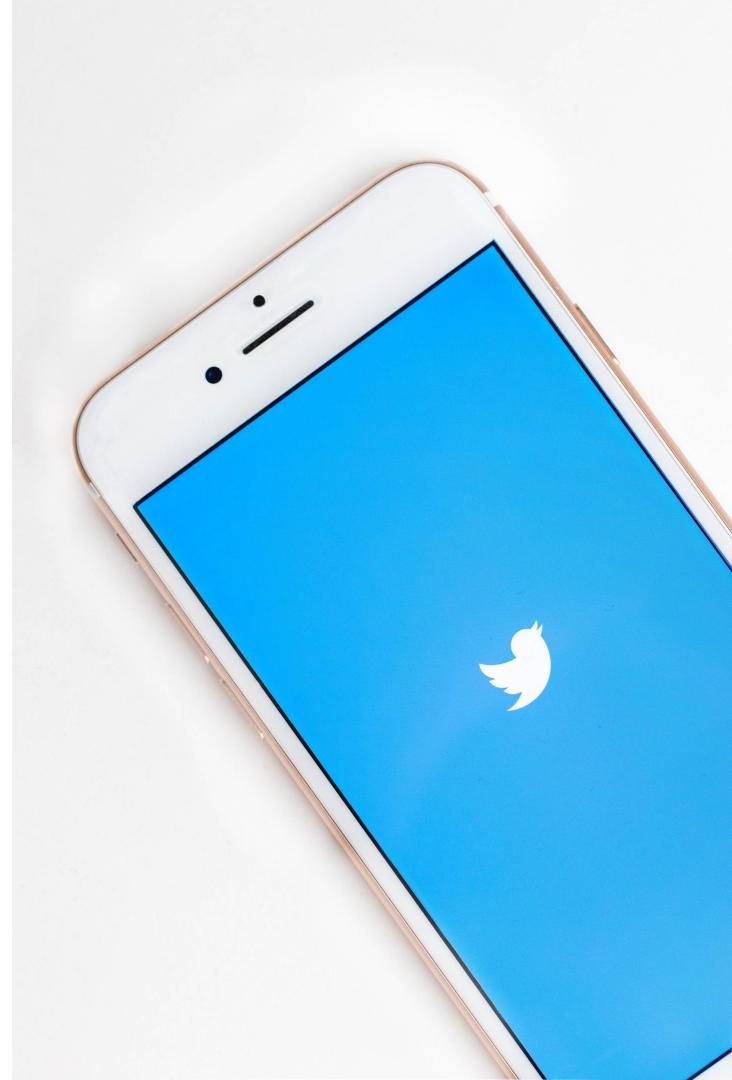


Reopened Keywords:

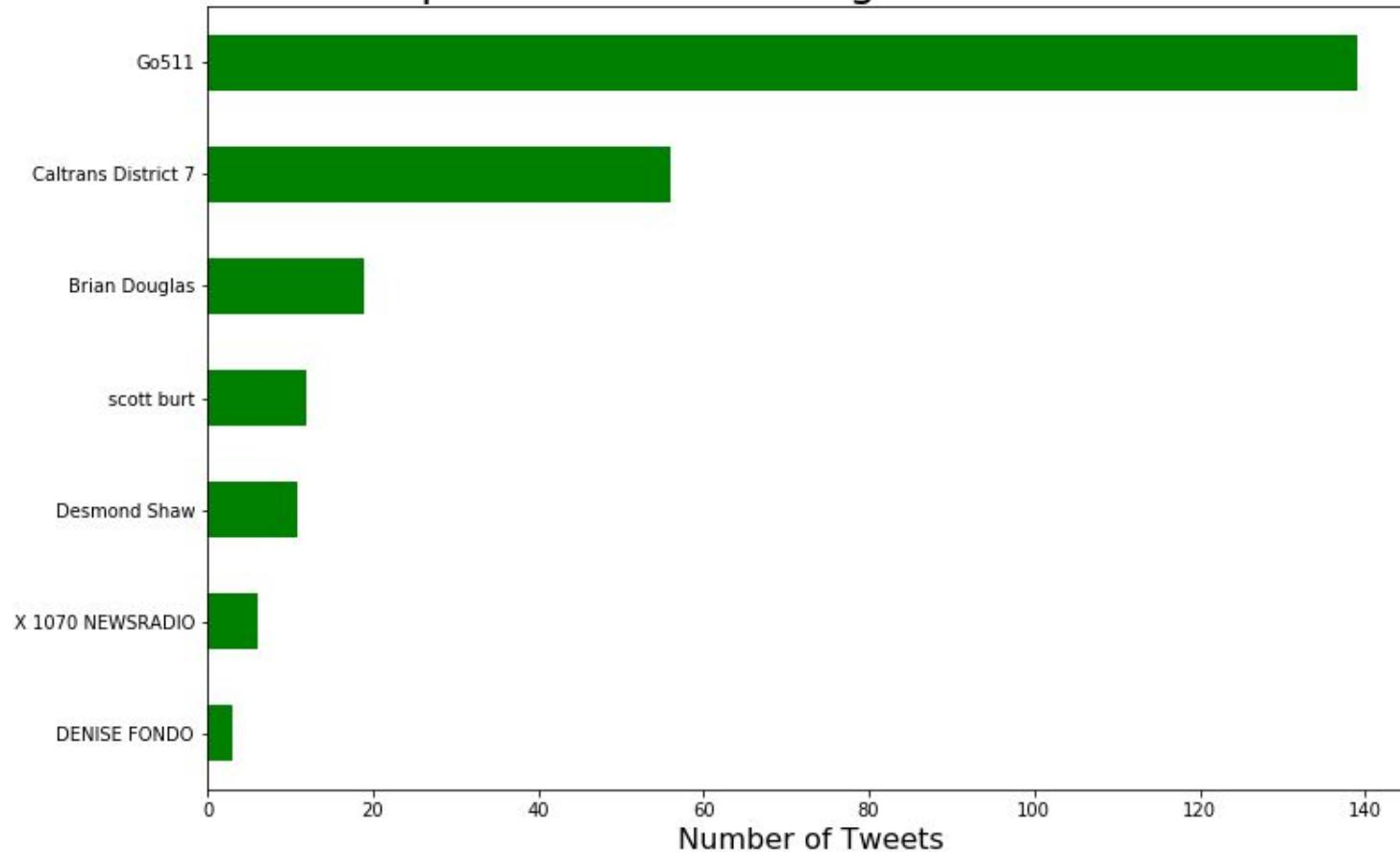
open, opened, lifted, reopened, clear, cleared

Tweet Example:

“ #mariafire road closures\nsanta paula \n\nlos angeles ave between santa clara ave and ca-34/somis rd\n\nsouth mountain rd between 12th st & balcom cyn\n\nberylwood rd at aggen rd\n\nwest la loma rd. between center rd & walnut ave\n\nprice rd at hwy 118\n\nclubhouse drive at hwy 118 ”



Top Accounts Providing Twitter Fire Data



A photograph showing a person's lower legs and feet. They are wearing white shorts and white sneakers with dark stripes. A skateboard is positioned diagonally across the frame, pointing from the bottom left towards the top right. The background is a dark, textured wall.

Unbalanced Classed:

8762 road open tweets

313 road closed tweets

Modeling

- CountVectorizer/Logistic Regression:
 - 99.9% on training data
 - 98.3% on testing data
- TFIDF/Logistic Regression:
 - 100% on training data
 - 98.5% on testing data
- Decision Trees
- Random Forest

Type I and Type II Errors:

Type I errors:

Incorrectly predicting the road was closed, when it is actually open.

In our example this would cause less cars/traffic/people using a safe escape route.

Type II errors:

Incorrectly predicting the road was open, when it is actually closed.

Model Evaluation

	Predicted Open	Predicted Closed
Actual Open	2874	18
Actual Closed	26	77

Accuracy: 98.53%

Specificity: 99.37%

Precision: 81.05%

Sensitivity: 74.75%

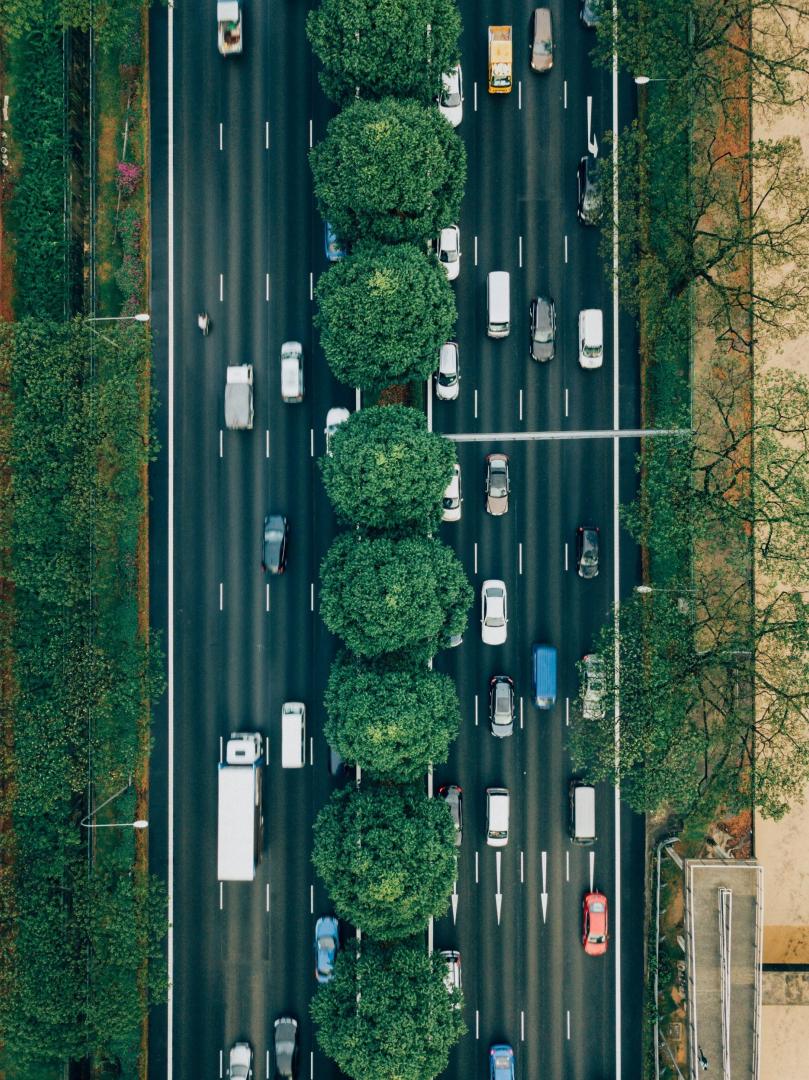
Here .com



Here.com

Real Time Traffic Info Site

- Extra precise for Autonomous Vehicles
- 10 - 20 cm accuracy
- ID New PotHoles
- ID Fast and Slow Lanes



Here.com Data

- JSON
- Nested Dictionaries
- Origin Incident:
 - Longitude
 - Latitude
- Mapped onto Google API

KEY

False Negatives - Twitter



True Positive - Twitter



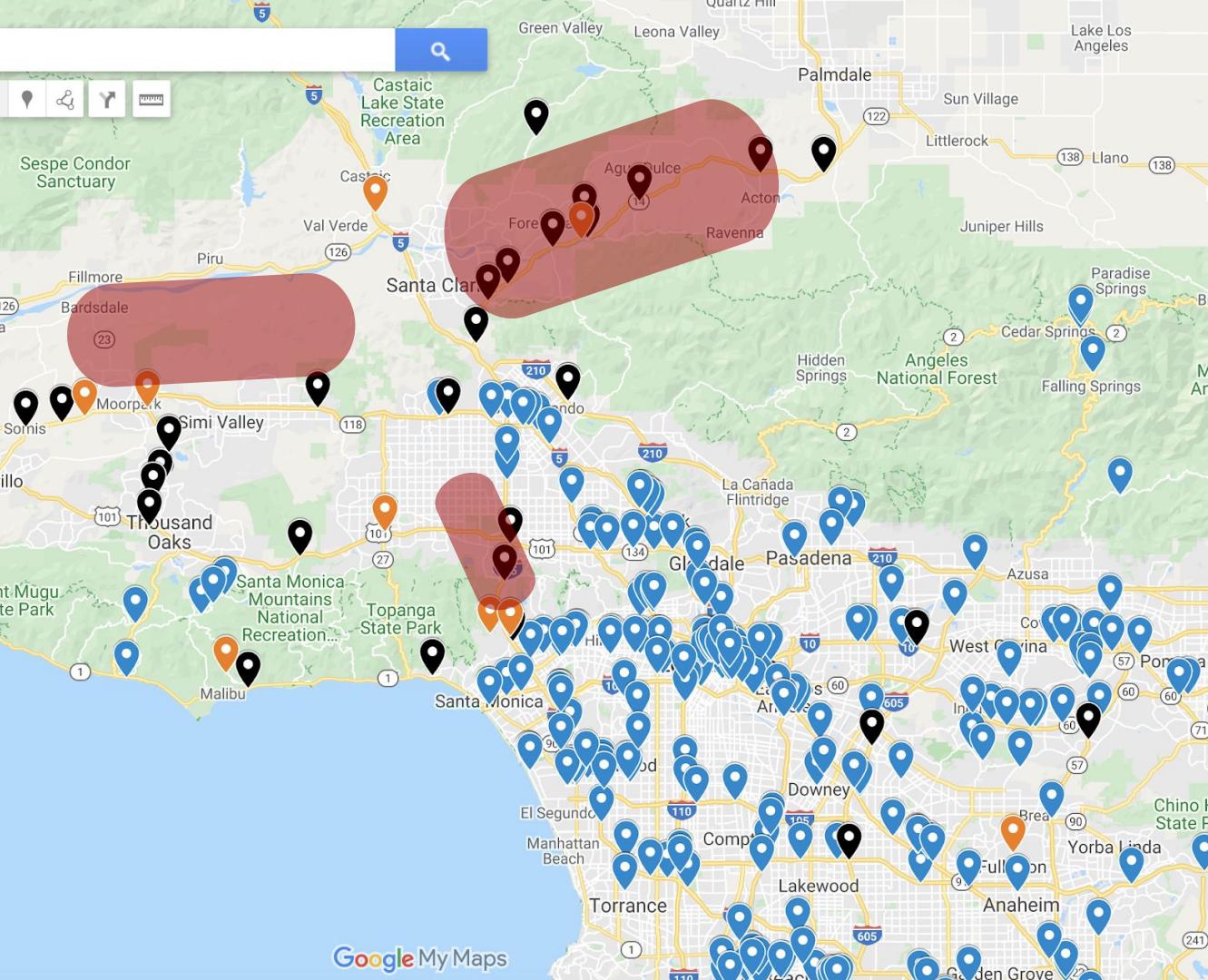
Traffic Incidents Here.com



Fires



Santa Barbara
and Anacapa
Islands ASBS
State Water...



Limitations of Here.com:

Learning Curve



Limitations of Model:

- Unbalanced Classes
- Limited Models



Limitations of Query Suggester:

- Test on more basic words
- Speed
- User implementation



Limitations of Twitter:

- Opt in geo info
- Geo info hard to get
- Accurately mapping location
- Limited natural disaster data



Next Steps & Recommendations

- Explore Here More
- Use Google Maps in Case of Emergency
- Use Twitter for Peripheral Disaster Info
- @Go511

KEY

False Negatives - Twitter



True Positive - Twitter



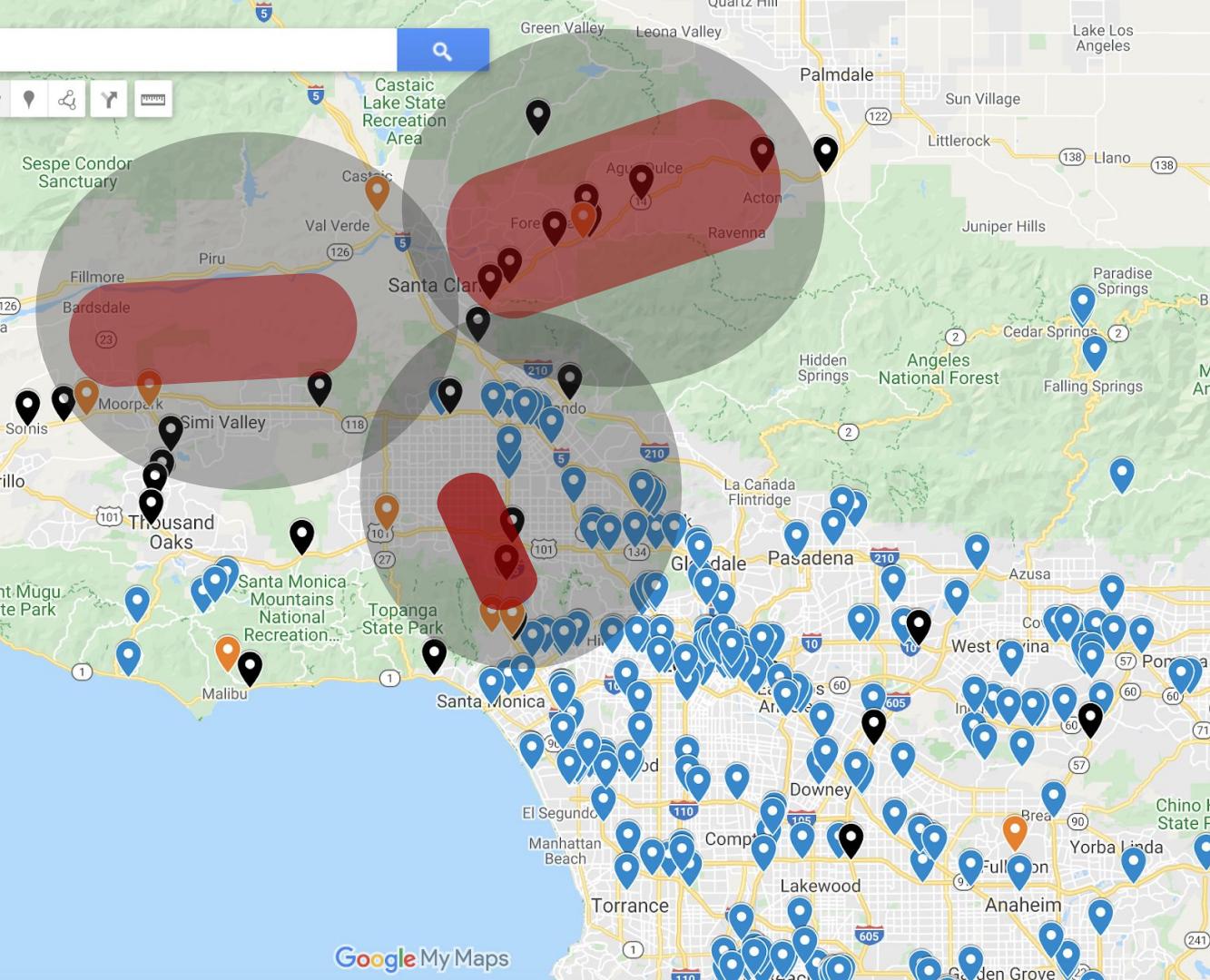
Traffic Incidents Here.com



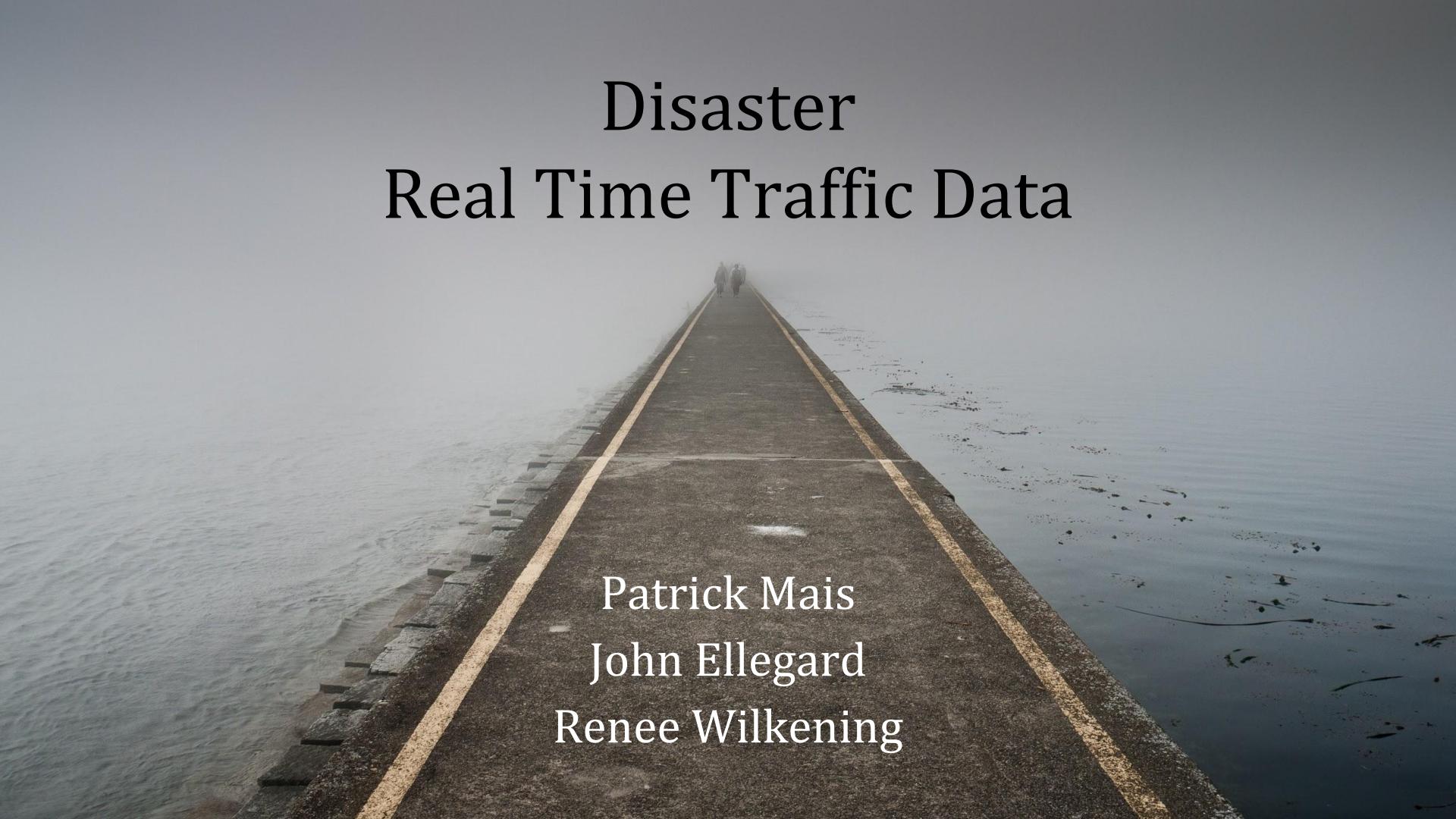
Fires



Recommended
To Avoid



Disaster Real Time Traffic Data



Patrick Mais
John Ellegard
Renee Wilkening



#UNSPLASH

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A Website for Free Photos

