Auto Log

Insight Data Engineering Fellowship, Silicon Valley

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Motivation

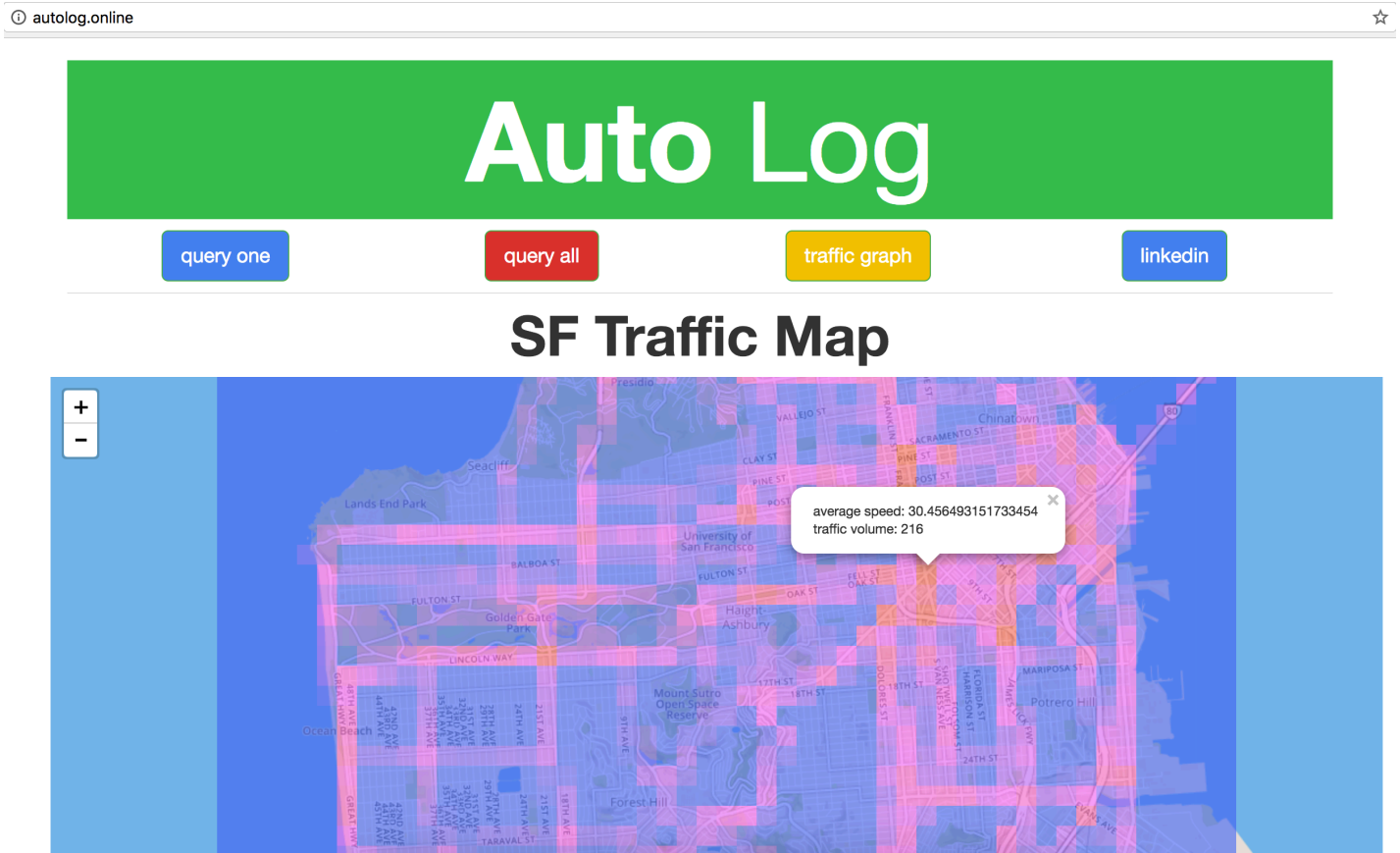
- Traffic in the Bay Area is a headache

- This framework can be used in to avoid traffic dense areas and for companies to re-route their customers/ vehicles
- Can also help companies monitor their fleets

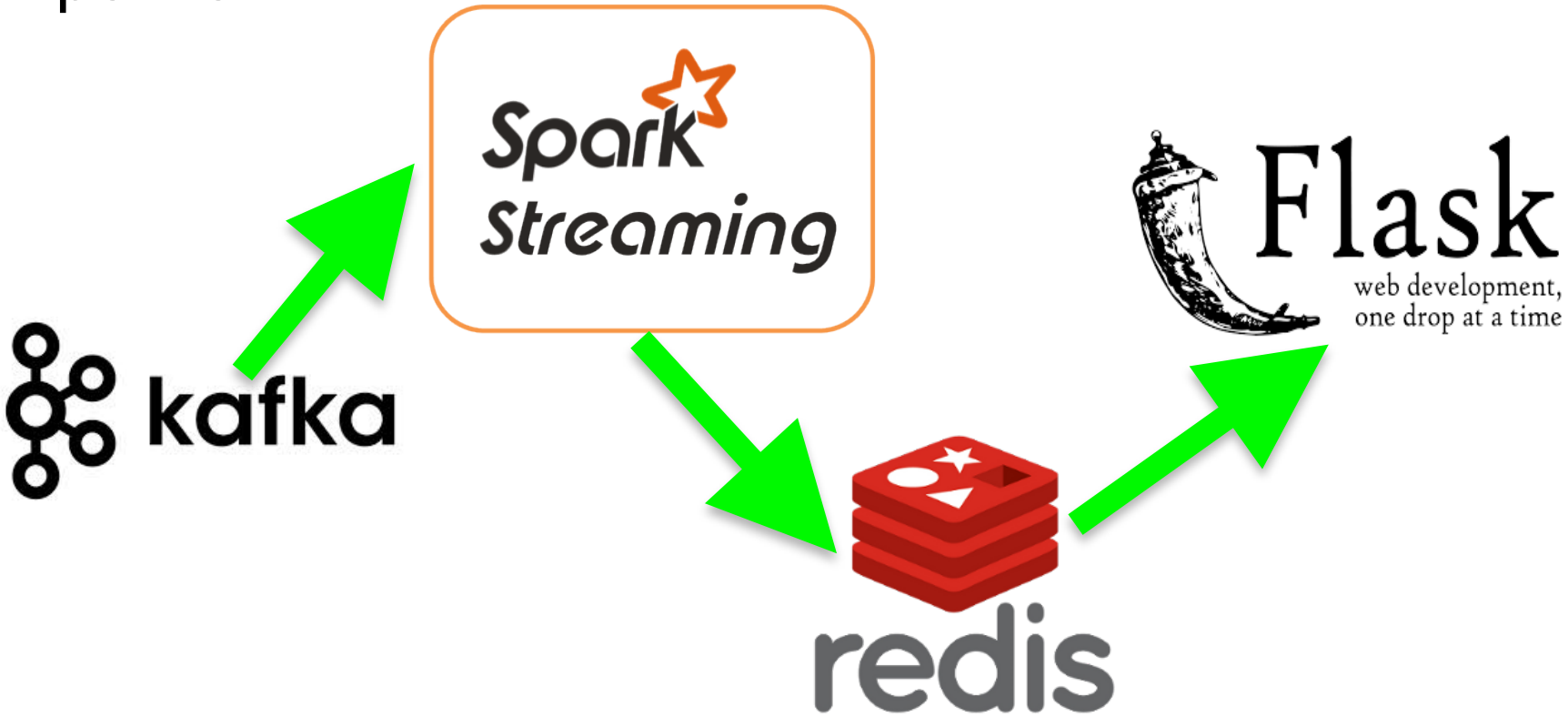
Product

http://autolog.online/

https://youtu.be/DCf3mRKyO_8

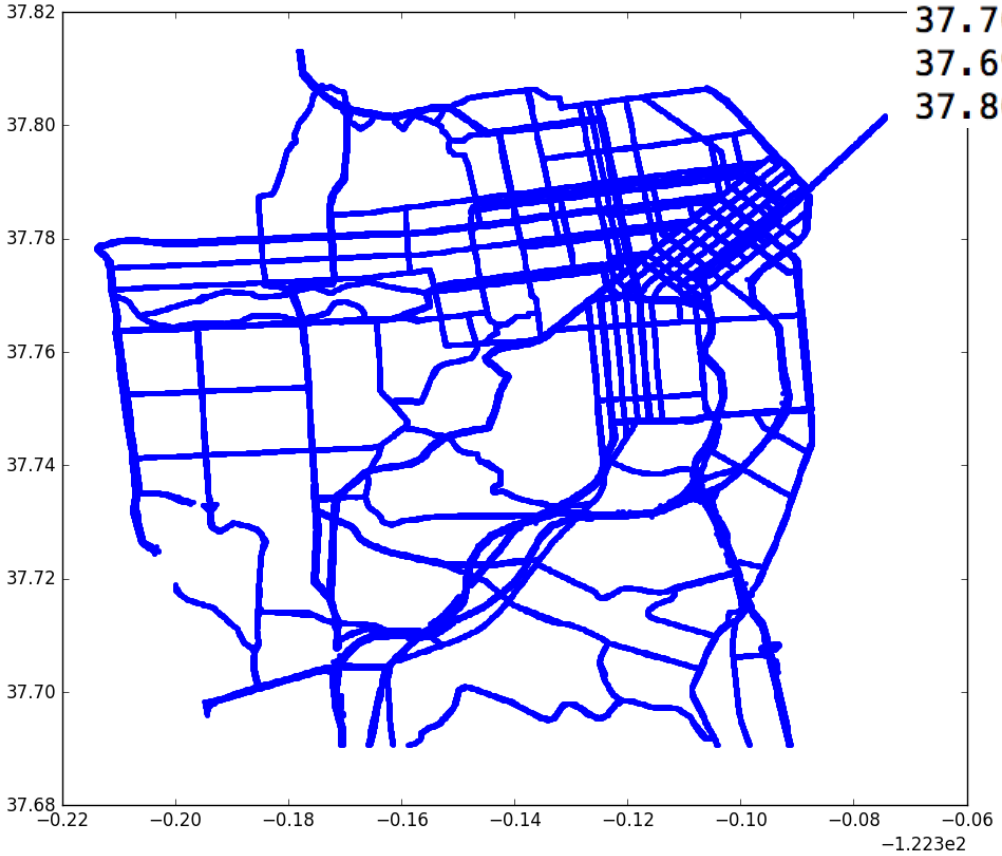


Pipeline


Spark
Streaming
kafka
Flask
web development,
one drop at a time
redis

Data

(lat, long, car id, time, speed)

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37.6982598733;-122.393299805;3;3;15.3936264874
37.8096423911;-122.477586013;4;3;6.2898761708
```

- Simulated on the simplified San Francisco map
- Simulate data is challenging

Queries

- The map is divided into 50 by 50 grids
- For each grid, the car density and the average speed is calculated and updated with the past 20 seconds data
- Since each grid is independent, all of them can be run in parallel on multiple nodes
- Compute and update data in real time is challenging

Other considerations

- Simulated data can behave **different** than real world
- The simulator can generate **280MB/minute** or **0.4 TB/day** on one t2.micro with1 million cars
- The pipeline uses 10 m4.large. It costs around $790.6 per month or **$26.35 per day** in a 30 day month

About me

- Machine Learning Engineer at GoFind.ai

  Worked on object detection and recommendation

- MS in Computer Science from UC Davis

  Studied and implemented classification algorithms

- BS in Applied Math from UC Merced

- Love badminton and cycling

Miscellaneous

- The grid is 790 ft. by 790 ft. square (around 2 city blocks covered by each side)
- Maximum processing: 19s @ 7000 messages/sec
- Data can be filtered by timestamp so data transfer delay won’t be a big issue
- Mapping of city block to an id can be done for showing specific traffic volume on each street
- Data skew is a good thing (reduce the complexity of computing the graph)