Traffic Monitoring with Machine Learning

Javier Hernandez, Russell Carter, Daniel Caceres, Vrezh Khalatyan, Grecia Zamora, Hue Ngo
# Table of Contents

1. Purpose [Javier]
2. Requirements [Russell]
3. Data Analytics [Daniel]
4. Data Visualization [Vrezh]
5. Demo [Gracie]
6. Upcoming Plans [Hue]
What is traffic?

- Moving vehicles on a road
  a. Estimated Time of Arrival
  b. Speed on a road segment
  c. The ratio of cars coming in and out of a road segment
Why Monitor Traffic?

<table>
<thead>
<tr>
<th>CITY</th>
<th>2017 ALL CITIES RANK (2016)</th>
<th>2017 INRIX TRAFFIC SCORECARD RANK (2016)</th>
<th>HOURS SPENT IN CONGESTION</th>
<th>ICI</th>
<th>PEAK</th>
<th>DAYTIME</th>
<th>OVERALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles, CA</td>
<td>1 (1)</td>
<td>1 (1)</td>
<td>![image] 102</td>
<td>18.3</td>
<td>21%</td>
<td>11%</td>
<td>12%</td>
</tr>
<tr>
<td>Moscow</td>
<td>2 (2)</td>
<td>2 (2)</td>
<td>![image] 91</td>
<td>20.1</td>
<td>32%</td>
<td>30%</td>
<td>26%</td>
</tr>
<tr>
<td>New York City, NY</td>
<td>3 (3)</td>
<td>3 (3)</td>
<td>![image] 91</td>
<td>17.4</td>
<td>19%</td>
<td>11%</td>
<td>13%</td>
</tr>
<tr>
<td>Sao Paulo</td>
<td>4 (6)</td>
<td>4 (6)</td>
<td>![image] 86</td>
<td>16.9</td>
<td>30%</td>
<td>23%</td>
<td>22%</td>
</tr>
<tr>
<td>San Francisco, CA</td>
<td>5 (4)</td>
<td>5 (4)</td>
<td>![image] 79</td>
<td>13.7</td>
<td>21%</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Bogota</td>
<td>6 (5)</td>
<td>6 (5)</td>
<td>![image] 75</td>
<td>16.2</td>
<td>36%</td>
<td>30%</td>
<td>30%</td>
</tr>
</tbody>
</table>

102 Hours Spent In Traffic

That's a lot of Time
200 Death on average a year

245 Death in 2017
Requirements

- Predict
  - Daily Traffic
  - Special Event Traffic
- Visualize Results
  - Traffic alerts
  - Alternative routes
Data Analytics

What is Data Science?
- Used to extract knowledge from large scale data
- Utilizing data from the Waze App

- Long Short Term Memory Recurrent Neural Network (LSTM RNN)
Why visualize?

- Gives us visual access to huge amounts of data in easily digestible visuals.
- State-of-the-art-platform to create and deliver beautiful maps that emphasize what is important to us.
Upcoming Plans

- Improve our predictive model
- Visualize the results in real time
- Implement the alert and alternative route features
We hope to improve the traffic conditions for everyone.
THANKS!

Any questions?