

An aerial night photograph of London, showing the River Thames winding through the city. The city is illuminated with warm yellow and orange lights, contrasting with the deep blue twilight sky. The River Thames is visible on the left, with several bridges crossing it. The city's dense urban landscape is filled with buildings of various heights, and a major railway line runs diagonally across the right side of the image. The overall scene captures the vibrant energy of the city at night.

Predicting traffic accidents in London

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June 2019

PROBLEM



- ❖ Each year about 1.25 million people die in traffic accidents
- ❖ Hard to predict where these will occur, to take necessary action (e.g. avoiding these routes in routing software or for driverless cars)
- ❖ Also relevant for insurance companies and government

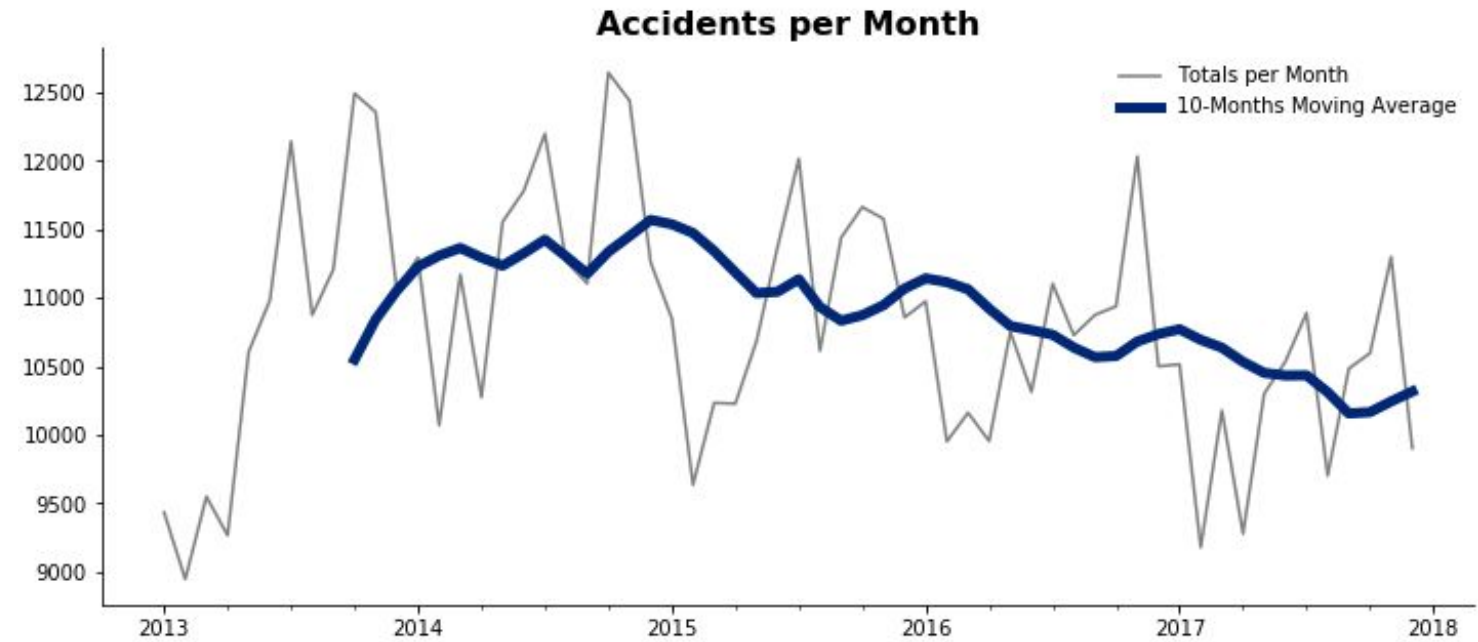
THE SOLUTION

Using satellite imagery combined with traffic accident and local area data to predict the location of traffic accidents



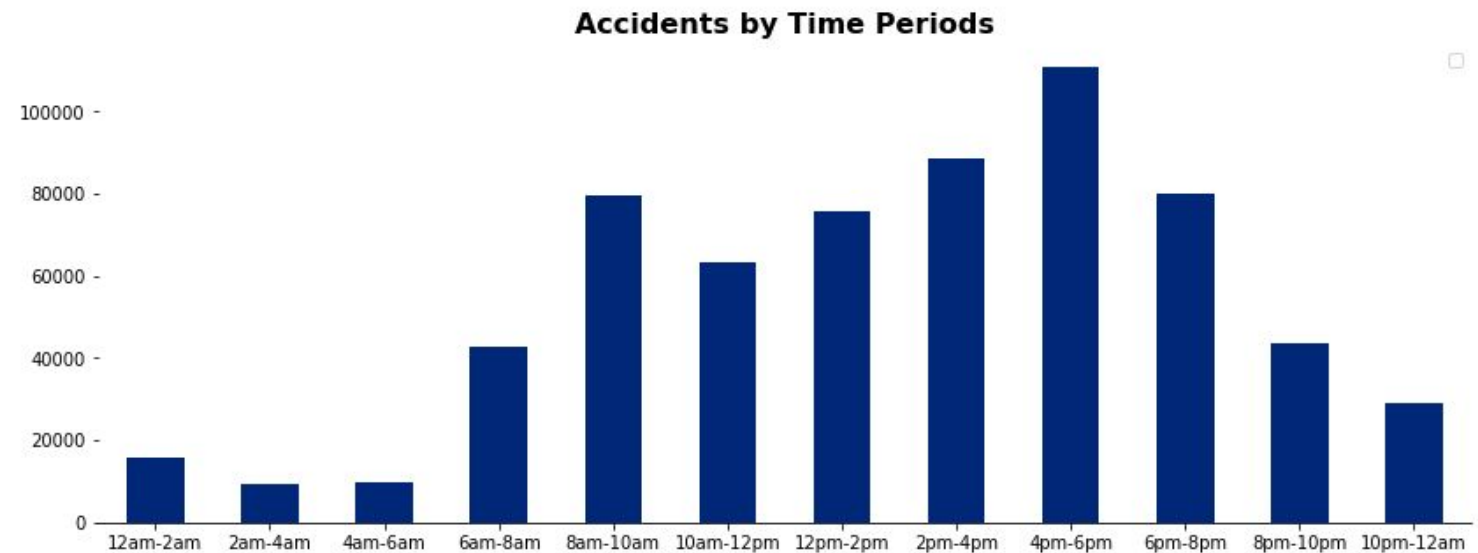
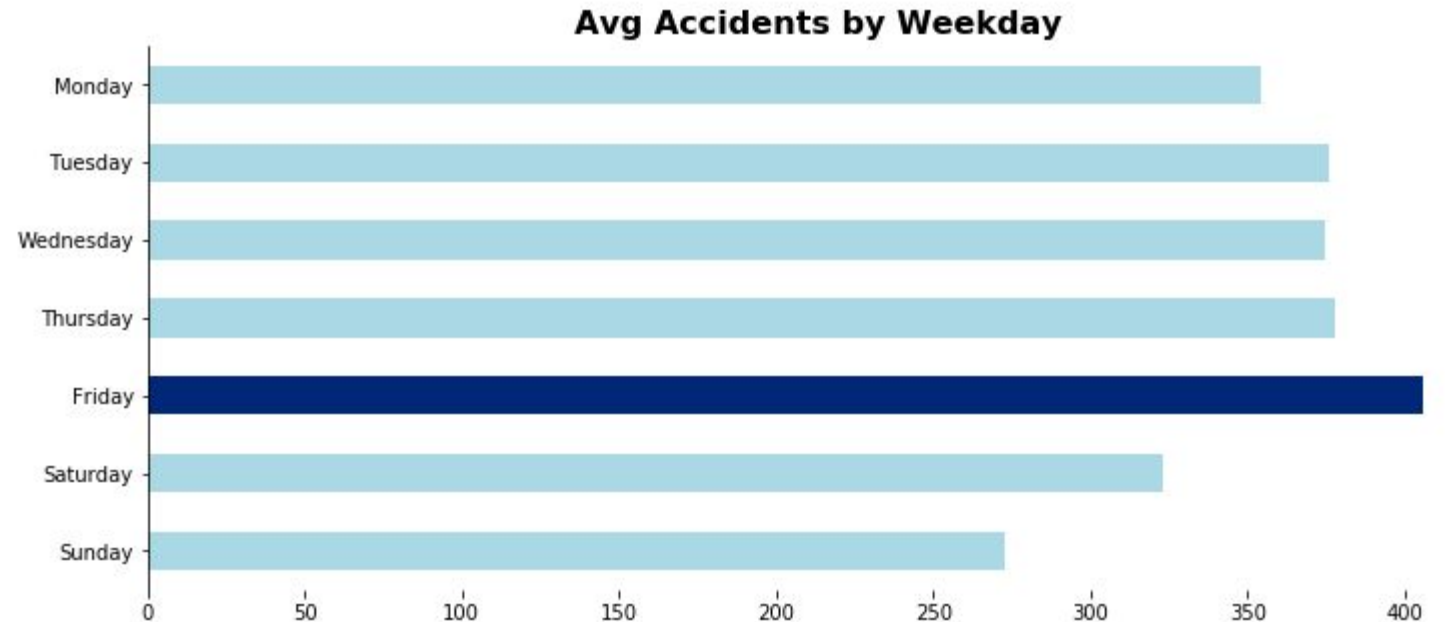
Accident trends

- ❖ Month: November & July
- ❖ Day: Friday
- ❖ Time: 4PM-6PM
- ❖ Age: 26-35 years old



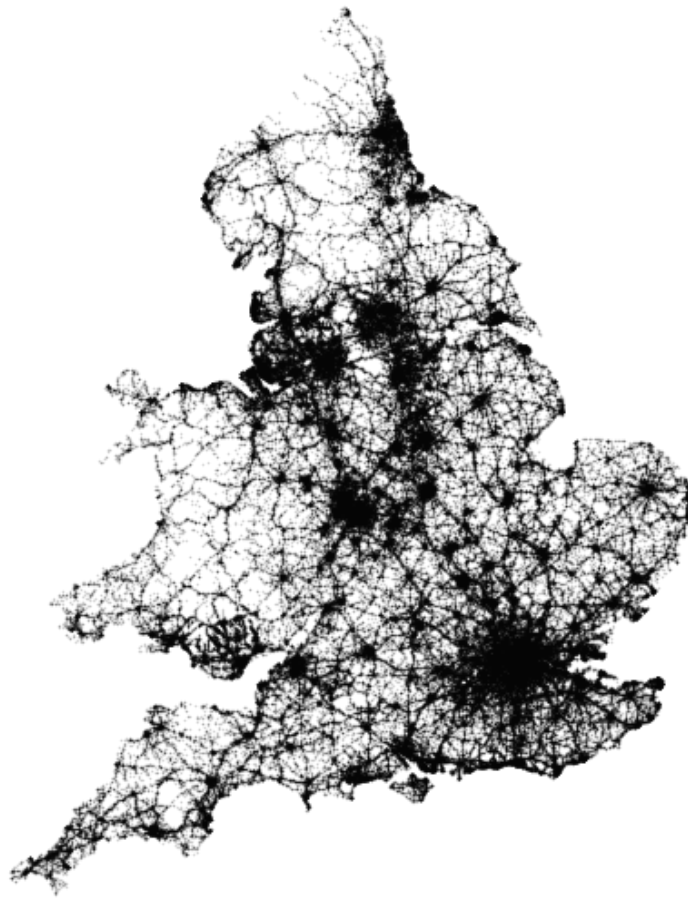
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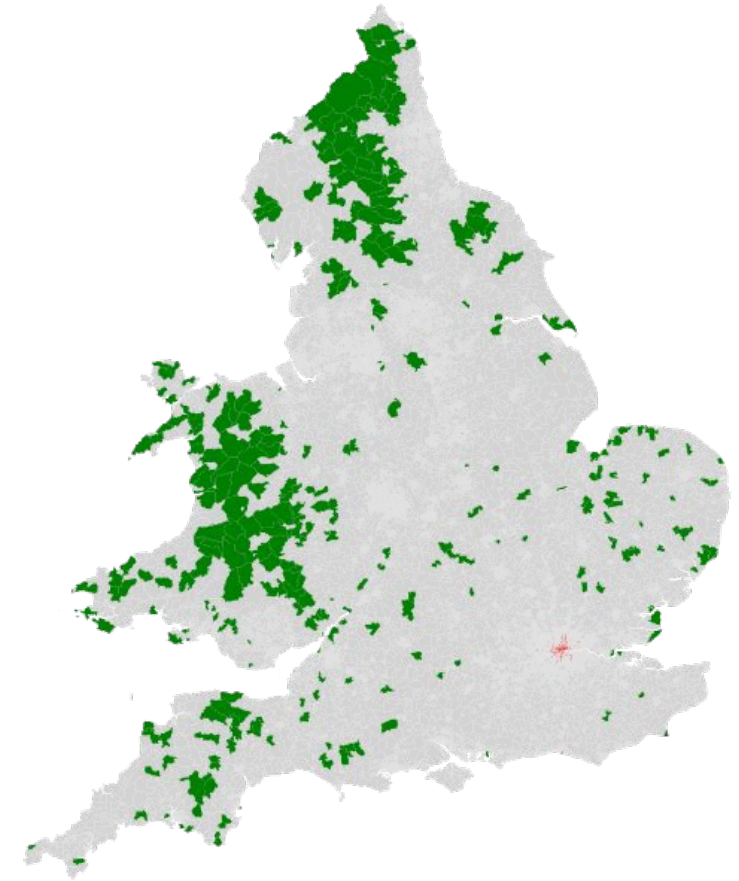


Accident hot-spots

Road traffic accidents in England and Wales, 2013-2017



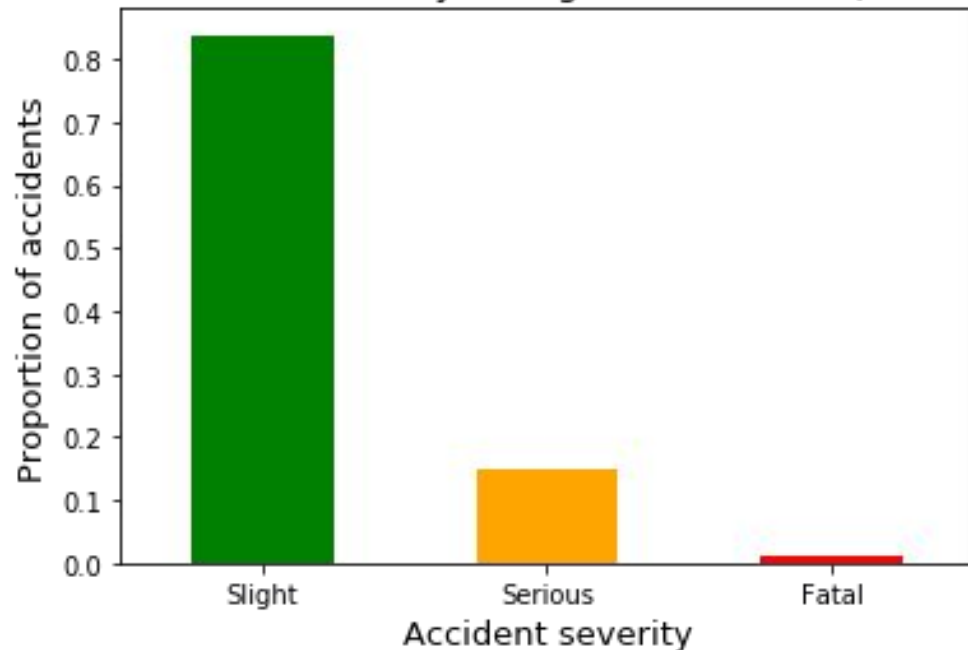
LSOAs in England and Wales with the highest (red) and lowest (green) density of traffic accidents 2013-2017



- ❖ Big cities have the most traffic accidents
- ❖ London contains 95% of the 300 worst areas of traffic accident density

Accident severity

Traffic accident severity in England and Wales, 2013-2017



Fatal accidents are more likely to be:

- ❖ On larger roads with higher speed limits
- ❖ On straight sections of road (not junctions)
- ❖ At night
- ❖ In rural areas

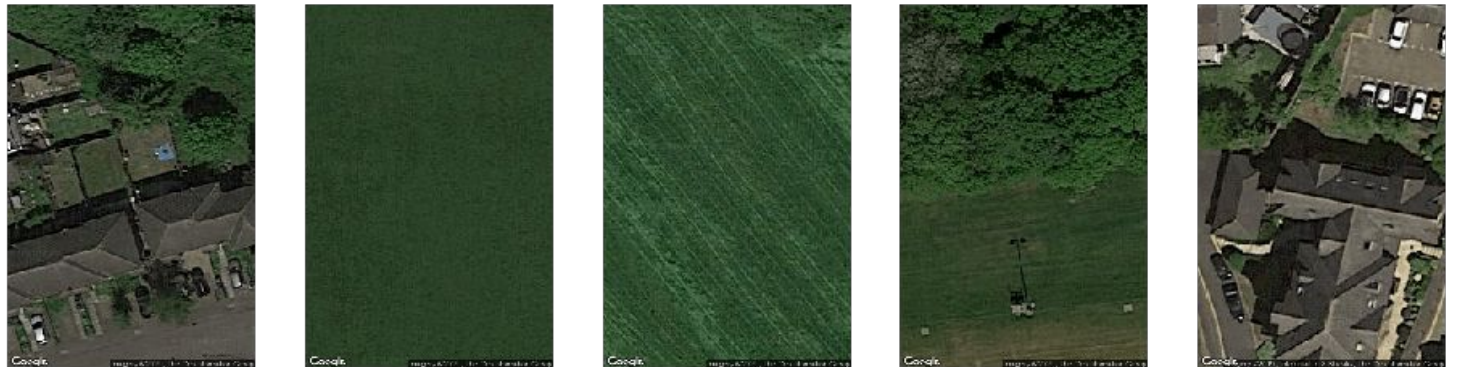
Methodology

- ❖ Three models - only satellite images, only other data, and combined
- ❖ Combined model performed the best (80% accuracy), with opportunities for further improvement

Examples of traffic accident areas



Examples of areas without traffic accidents



Predicting the location of traffic accidents

- ❖ Predicting locations of serious or fatal accidents
- ❖ Able to predict the worst locations for traffic accidents with 82% accuracy

safe

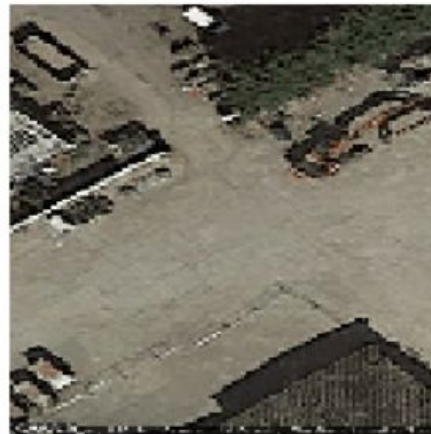


Rural

fatal/serious



safe

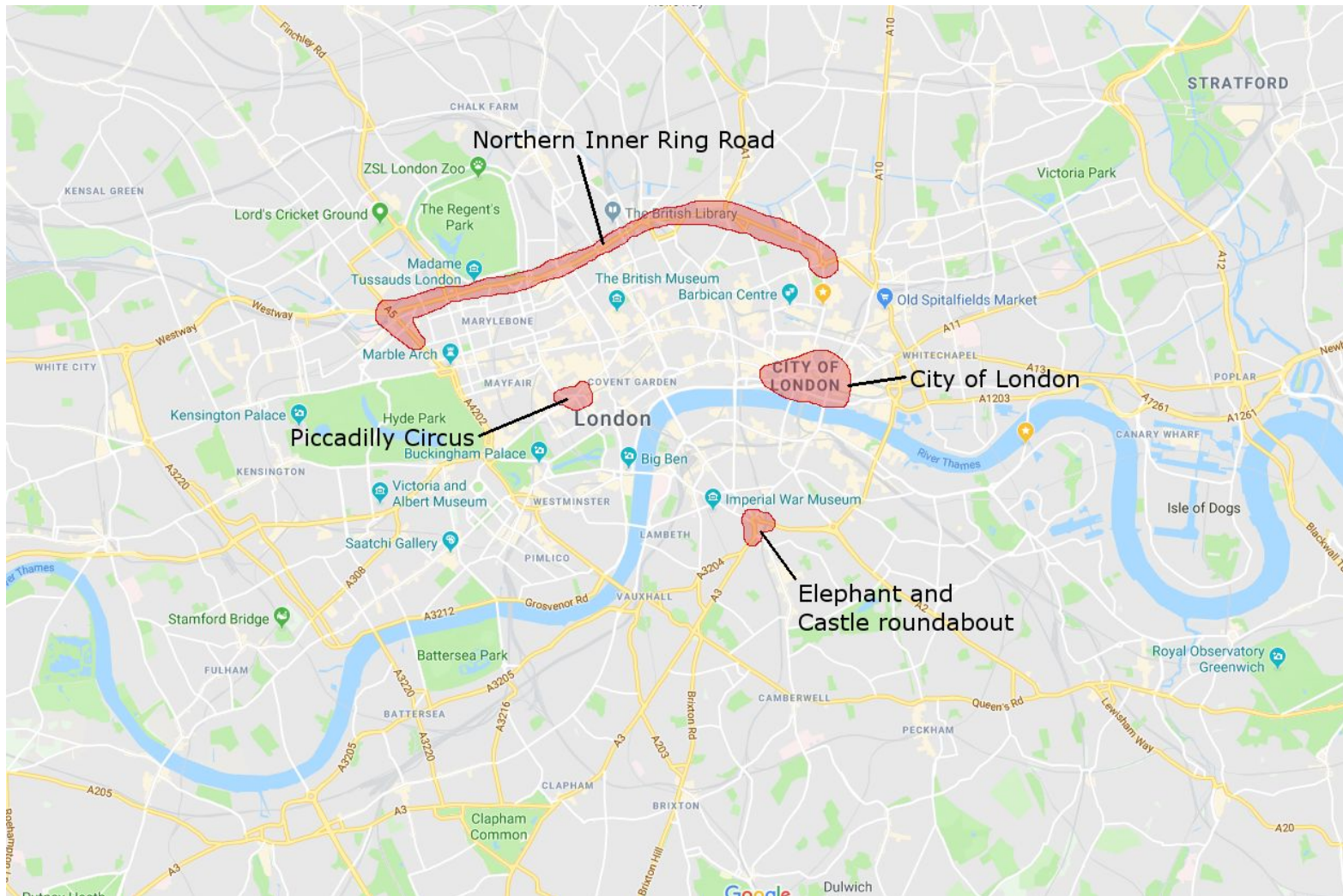


Urban

fatal/serious



Rural and urban danger zones



Conclusions & future work

- ❖ Being able to predict the location of road traffic accidents could have many beneficial uses
- ❖ Promising results from combining satellite images and other data
- ❖ Future work could include:
 - Expanding to other cities and countries
 - Adding other data sources
 - Adding more images to learn from

An aerial night photograph of London, showing the River Thames winding through the city. The Tower Bridge is illuminated on the left, and the city lights create a warm glow against the dark sky. A large railway viaduct runs diagonally across the right side of the image. The text "Any questions?" is overlaid in the center in a white, sans-serif font.

Any questions?