

A Highway Vehicle Routing Dataset During the 2019 Kincade Fire Evacuation

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Project Description

As wildfires become increasingly more prevalent and severe in California, it is imperative to study how people respond to wildfire events. To support the development of more accurate wildfire evacuation simulations, this project publishes the first dataset to capture highway vehicle routing behavior during the 2019 Kincade Fire, Sonoma County, California. The 2019 Kincade Fire started at 9:27 p.m. on October 23, 2019 and was fully contained at 7:00 p.m. on November 6, 2019.

The highway vehicle routing dataset provided in this work was derived from GPS data. The GPS data¹ was provided by Gravy Analytics and built on privacy-friendly mobile location data. Gravy's location data platform processes raw location signals from multiple data providers representing over 150 million U.S. mobile devices. To capture the entire evacuation process, we extracted highway vehicle routing behavior from one week before the fire (October 16, 2019) to one week after the fire (November 13, 2019). The new dataset is completely anonymous and includes a total of 22,215 highway trips. Fields of the dataset include anonymous user ID, latitude of a vehicle's entrance of a highway, longitude of a vehicle's entrance of a highway, timestamp of a vehicle's entrance of a highway, entrance highway, latitude of a vehicle's exit of a highway, longitude of a vehicle's exit of a highway, timestamp of a vehicle's exit of a highway, exit highway.

The highway vehicle routing dataset is presented in comma-separated values (CSV) format. We also provide a shapefile of the highways included in the dataset (i.e., U.S. Highway 101, State Highways 1, 12, 37, 116, 121, and 128).

This new dataset can be used to better analyze a householder's evacuation departure time and route choice and to validate the existing evacuation simulation models. This dataset can also serve as an educational instrument to train the next-generation disaster scientists and engineers who can leverage big data analytics for weather-ready research.

¹ The GPS data underwent Gravy's cleansing processes and was optimized with Gravy Location Data Forensics--filtering and categorizing inaccurate and even fraudulent location signals. This enabled us to identify and use only the cleansed location signals relevant to this project.

Description of Variables

Variable	Description
ID	Anonymous identifier for mobile devices
Entrance_LAT	Latitude of vehicle's entrance of highway
Entrance_LON	Longitude of vehicle's entrance of highway
Entrance_TIMESTAMP	Timestamp of vehicle's entrance of highway as epoch time in milliseconds
Entrance_HWY	Entrance highway
Exit_LAT	Latitude of vehicle's exit of highway
Exit_LON	Longitude of vehicle's exit of highway
Exit_TIMESTAMP	Timestamp of vehicle's exit of highway as epoch time in milliseconds
Exit_HWY	Exit highway

Contact Information

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