Data Illuminators: Scalable Data Analysis for Nighttime Crosswalk Lighting

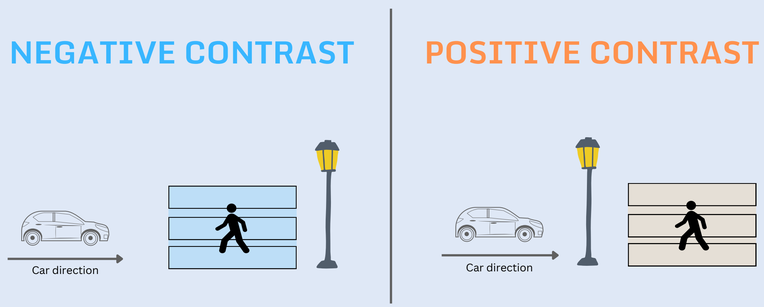
Scan here for full map

Problem: 76% of pedestrian fatalities occur at night. Nighttime crashes at rural and urban intersections can be **reduced by 33-38%** with well-designed lighting. However, there is no scalable way to identify which crosswalk intersections are in need of redesign.

Solution: Use existing geospatial (GIS) data to create an interactive map that **classifies contrast and brightness** at each crosswalk.

Ideal Crosswalk

A well lit crosswalk will have high brightness and the pedestrian will be in positive contrast.



Spatial Datasets

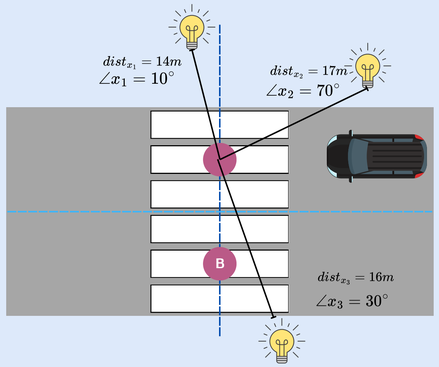
Crosswalks
(spatial type: Polygon)

Streetlights
(spatial type: Point)

Street Segments
(spatial type: LineString)

Calculate Brightness and Contrast

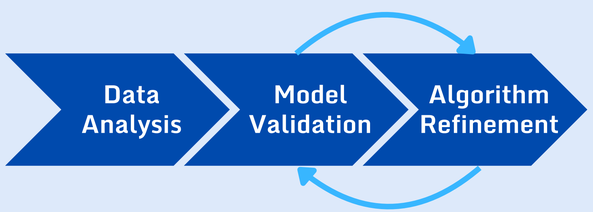
Calculated based on every streetlights' distance, angle, and relative position to the crosswalk.



Postive Contrast

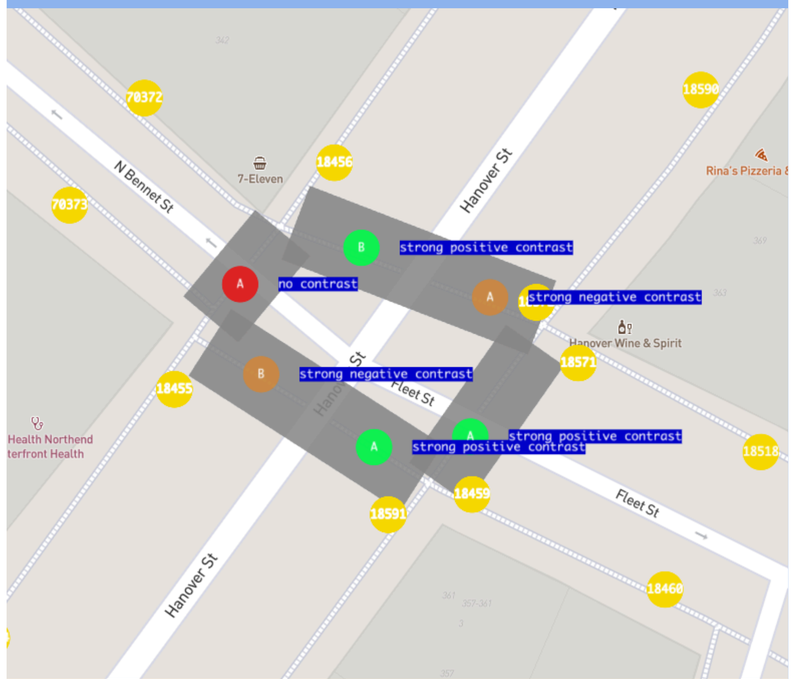
High Brightness

Model Validation



Validation data compared real life values to the models predictions.

Interactive Map - Data Visualization



Making Impact

Work and documentation will be made open source and publicly available.

Volpe Center can share our project with other local governments, enabling them to identify focus crosswalks.

Team


Allyson Hur


Daeyoung Kim


Maya Cranor


Natsuki Sacks


Rucha Dave

Advisor

Lawrence Neeley

U.S. Department of Transportation Volpe Center

SANTOS FAMILY FOUNDATION

Olin College of Engineering