

**Research** → **The Social Distancing Project**

### Objectives

This research gather data on outdoor pedestrian and light vehicle to form a **map of urban mobility and space occupancy** under social distancing policy. This data will enable researchers to infer the activities, contexts, origins and destinations of the people in public spaces.

- Where and why
- Small scale human interaction
- Analysis of infection patterns in relation to social distancing compliance

Times Square before and after lockdown

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### Data Collection

Creating a multi scale – multi perspectives data set

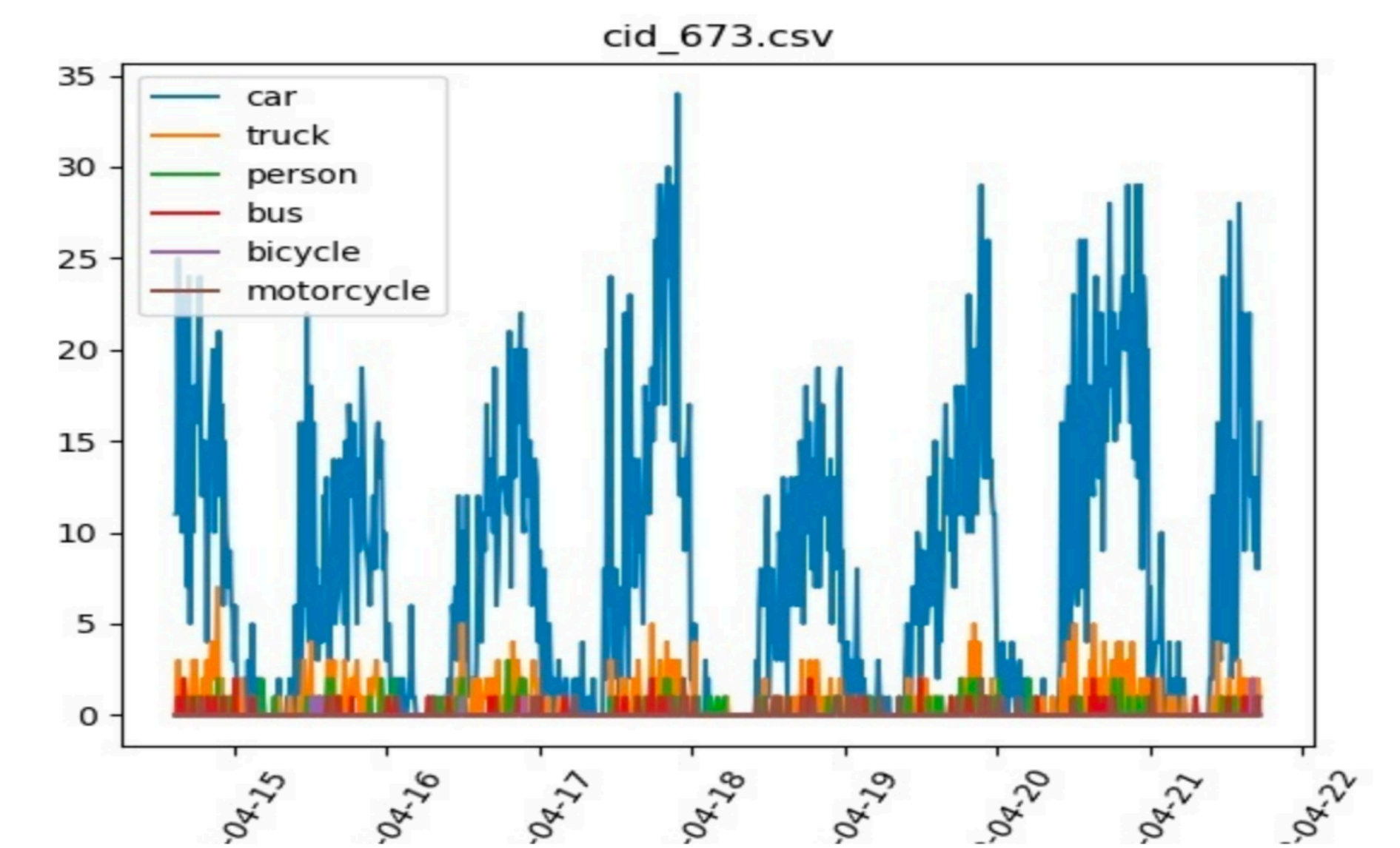
- The City Top-down**: NYC DOT Web Cams. Video streams captured from approximately 650 public traffic cameras throughout NYC.
- The Public Street level**: NeXar + Mapillary. Video footage taken from instrumented vehicles driving through city streets.
- The Individual Bottom-up**: Google takeout + Qualtrics. Mobile phone location data volunteered by local citizens supported with a questionnaire.

### System Implementation

- Using Yolo as a framework for object detection
- Yolo applies a single neural network to the full image and then divides the image into regions and predicts bounding boxes and probabilities for each region
- Thousands of images from the Department of Transportation in New York were run through the Yolo framework to produce a result.
- Pedestrian images were analyzed and a count of every object in the image was recorded

### Results

- Generated graphs that depict object counts on different days of the week
- Images that depict mask detection, distance, and human recognition



### Future Work

- Analyze how social distancing affects infection rates in Urban areas
- Understand if enough people are complying to social distancing standards and if so, in what areas is this occurring in?

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1st analysis: Geolocation data: Street corner, upper east side, mixed use + residential + commercial

2nd analysis: Socioeconomics: Demographics, Pandemic statistics

PERSON Gender - Male Age - Under 50 Activity - walking

PERSON Gender - Female Age - Over 50 Activity - walking

MASK

SHOPPING BAG

Street Signs Function and reason to go out/in

Width of a sidewalk Dictates distance between people

Skyline Indicates density + land use

Place

People

Distance

Activity

Posture

Equipment