

Pedestrian counts using archived webcam imagery: a validation study

Active Living Research 2017

Promoting Active Travel

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ALR Connections

Center for
Geospatial Analytics



SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON



AMOS

1,072,958,613 images and counting

Welcome to AMOS, the Archive of Many Outdoor Scenes!

AMOS is a collection of long-term timelapse imagery from publicly accessible outdoor webcams around the world. We explore how to use these images to learn about the world around us, with a focus on understanding changes in natural environments and understanding how people use public spaces.

To support these applications, we work on fundamental research in camera geolocation, camera calibration, camera registration to GIS data, and the automatic annotation of events and objects in a scene.

The AMOS project began in March 2006 and is currently maintained at Washington University in St. Louis by [Robert Pless](#) and at the University of Kentucky by [Nathan Jacobs](#).

We encourage you to learn more about the [AMOS dataset](#), [project participants](#), and [publications](#). Options for browsing the dataset and contributing webcams to the archive are available through the links on the right.

Acknowledgements [+]



the archive of many outdoor scenes

AMOS

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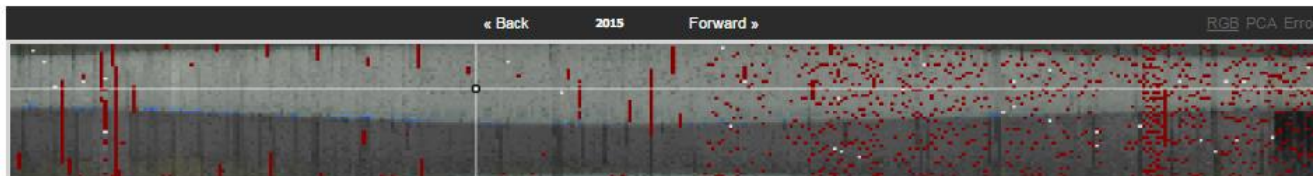
Qns Blvd @ QnCnt Mall

Next »



Sun May 10 2015 12:04:13 GMT-0400 (Eastern Daylight Time)

[Compare this image to an image from a previous day.](#)
[Analyze GCC score!](#)



Day of Year: Time of Day:
<http://nyctmc.org/>

Geolocation Map

Search for Location



Camera Information

Name: Qns Blvd @ QnCnt Mall
 Date Added: Nov 10, 2012 at 01:09:06 UTC
 Last Captured: Feb 28, 2017 at 13:04:16 UTC
 Next Scheduled Capture Time: 4 minutes 58 seconds.
 Active: ✓
 Tags: geoValid geoX google_plaza google_suburb
 google_town google_traffic google_vehicle unstable
 Dimensions: 352 × 240 pixels

tags, to, add

☆☆☆☆☆ (Current Rating: None)

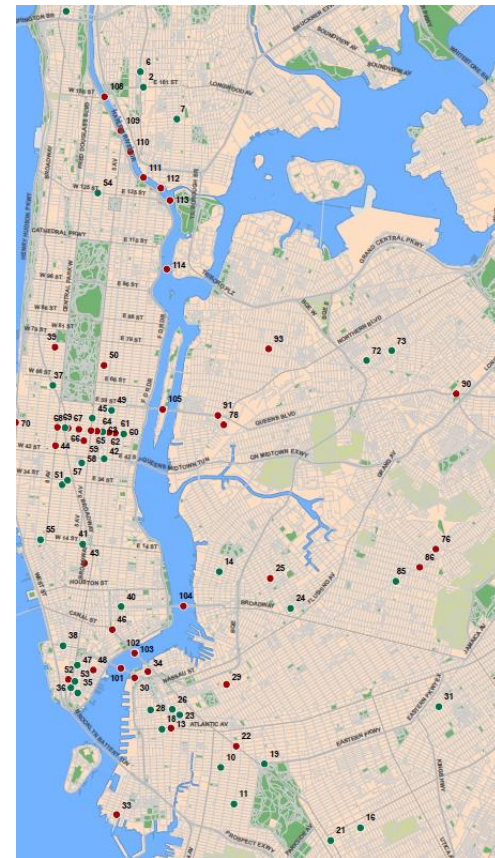
- Project Overview
- Dataset Info
- Browse Cameras
- Browse Tagged Images
- Browse Map
- AMOS Visualizations
- Submit Camera
- Random Camera
- Docs

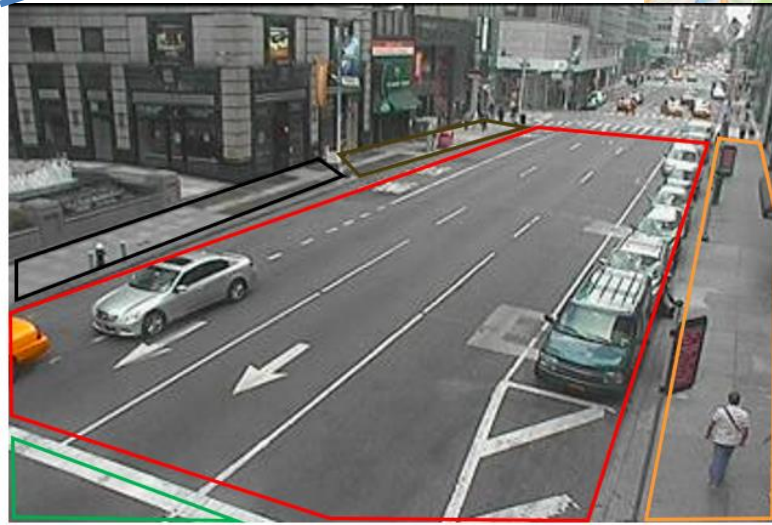
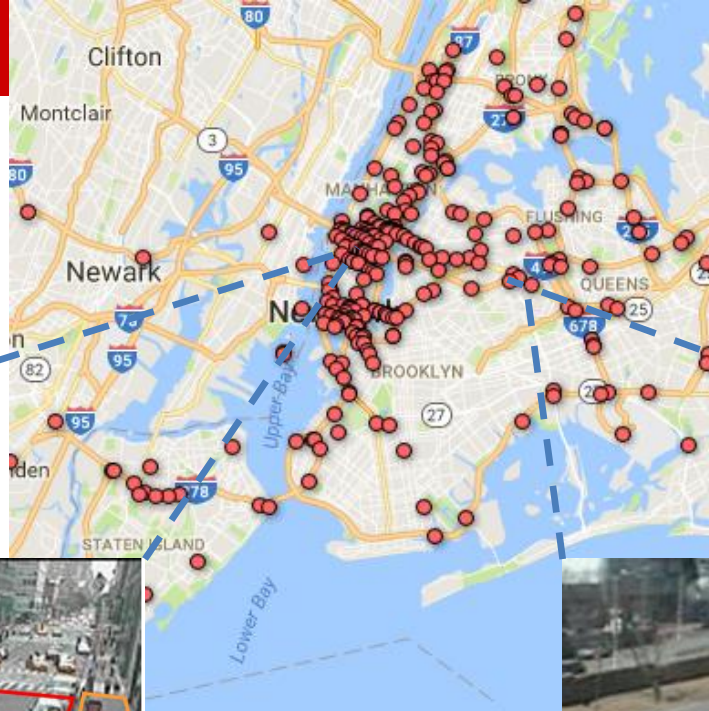
[Download Camera Data](#)
[Geocalibrate this Camera](#)

Log in

Methods

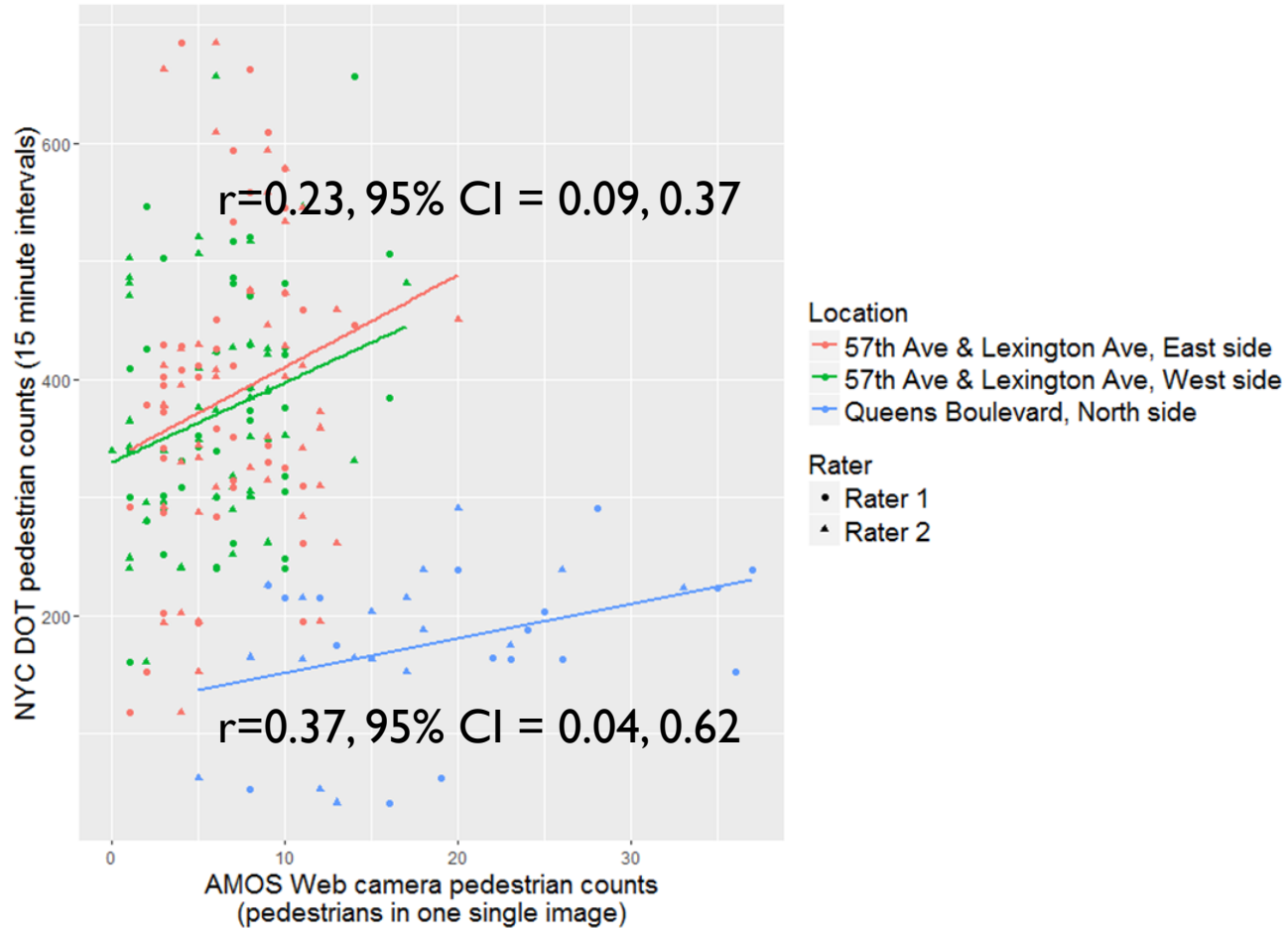
- New York City's Department of Transportation (NYCDOT) collects pedestrian counts in 114 locations twice each year
 - May and September
 - Weekday 7-9a and 4-7p
 - Adjacent Saturday 12-2p



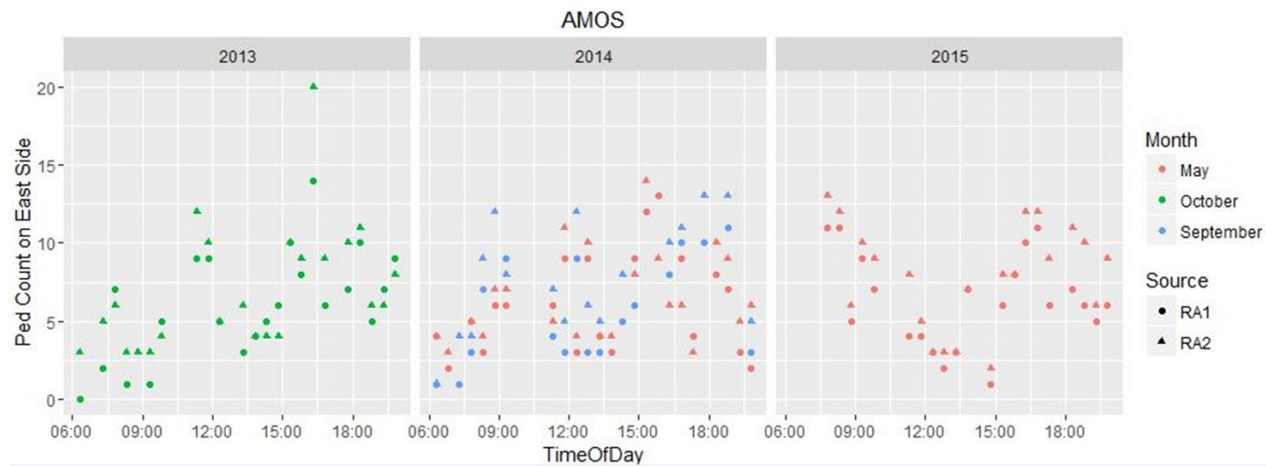
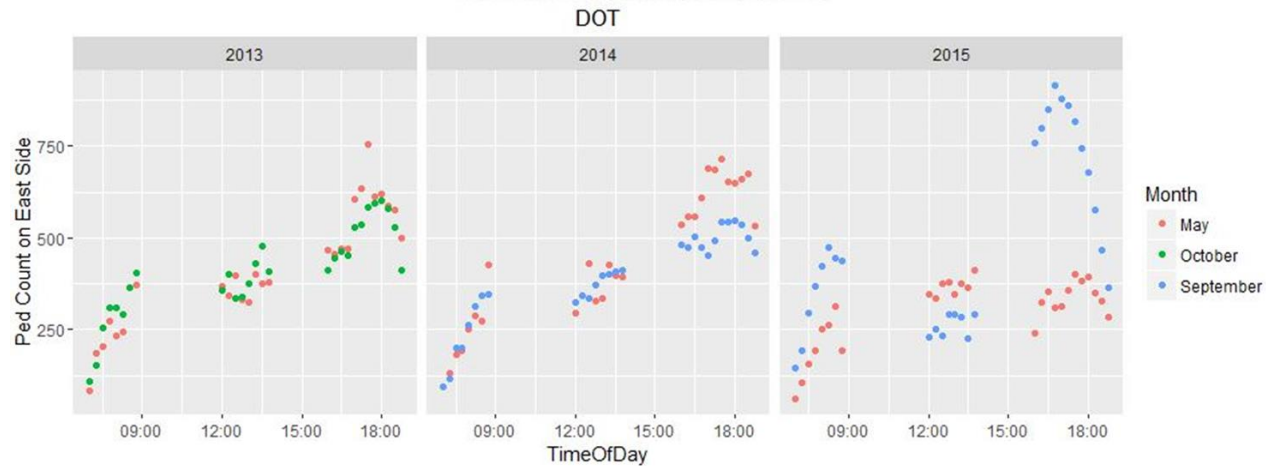


Methods

- Overlapping camera and in-person locations
- 2013, 2014, 2015
 - 84 hours per site of in-person counts
- 108 archived images matched per site
- Image counts by trained research assistants



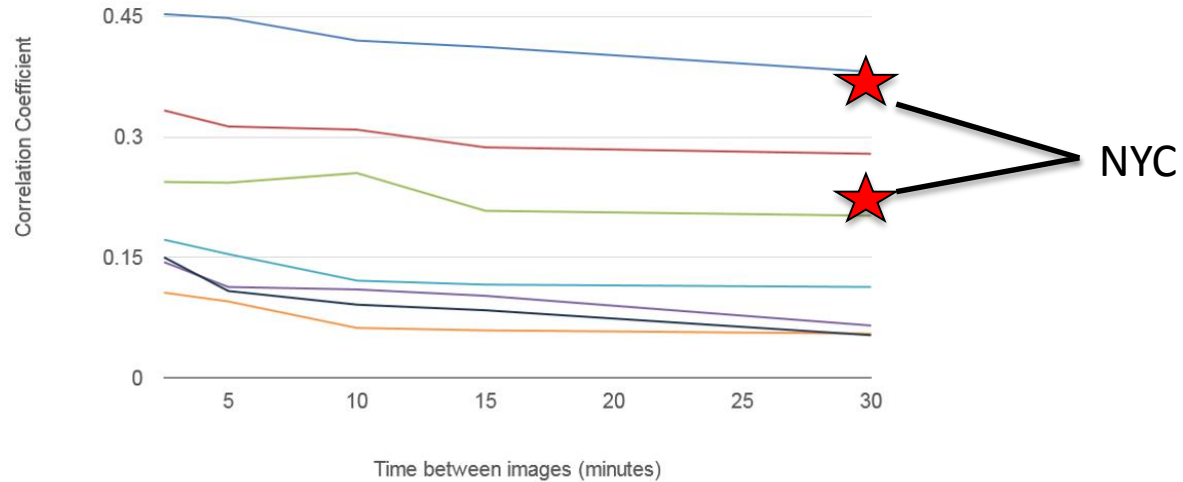
East Side of Lexington b/t 57th and 58th



AMOS predicted NYCDOT count within +/- 19%



Correlation between observed pedestrian counts and pedestrian annotation in webcam images



Conclusions

- Camera imagery to count pedestrians holds promise.
- Further model calibration, including accounting for angle differences between webcams, may be needed.
- More frequent image capture intervals decreases prediction error.
- Municipal departments improving pedestrian environments might experiment with using webcams to efficiently and rigorously evaluate the improvements' effectiveness.
- Webcams also able to capture environmental attributes and changes.

Thank you

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