

# Machine Learning Research

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Assistant Professor

Public Administration and Policy

Political Science

# Background



**University of Georgia**

Assistant Professor

Public Administration and  
Policy

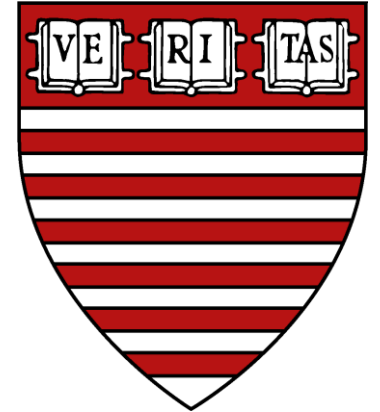
Political Science



**UC Berkeley**

Data Science Fellow, School of  
Information, 2015-2016

PhD Political Science, 2013



**Harvard Kennedy School**

Democracy Fellow, 2013-2015

# Research Interests

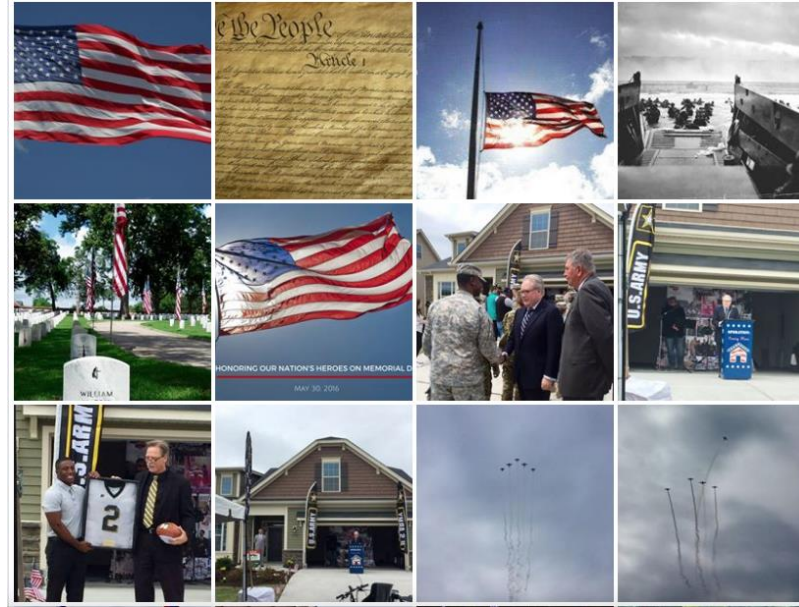
- Applied image analysis – computer vision/deep learning
- Applied text analysis – topic models, supervised machine learning.
- Experiments and causal inference.

# Image as Data: A Computer Vision Framework for the Analysis of Political Images

- Development of a framework for political image analysis.
- Exploration of House of Representatives photographic “homestyles” – how they convey information to their constituents.

# Image as Data: A Computer Vision Framework for the Analysis of Political Images

- Image features which communicate partisanship/ideology.
- Image features which communicate qualification, identification and empathy.



Facebook Photos – Rep. George Holding (R-NC)

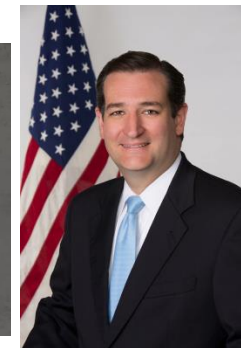


Facebook Photos – Rep. Steve Cohen (D-TN)



# Data

300,000+  
**Facebook**  
images with  
text posts for  
accounts of  
356 members  
of the House  
and Senate.



# Image Experiment: Does who politicians pose with affect opinions about them?

Alone



Man



Woman

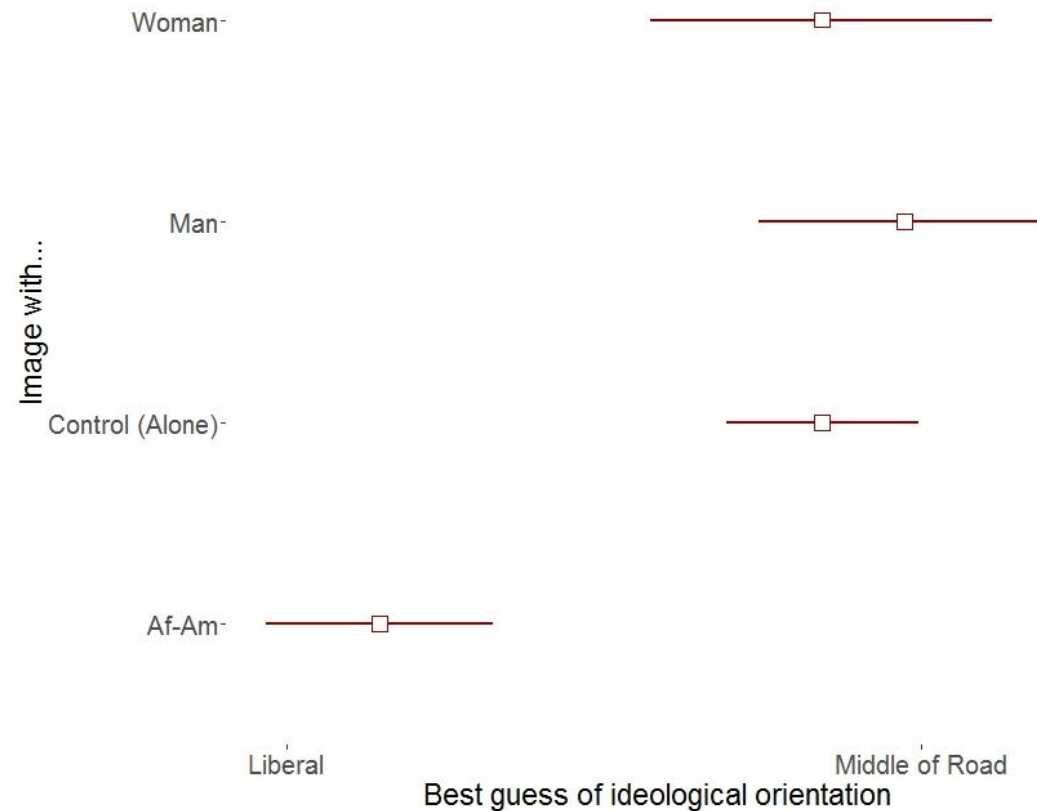


Af. American



# Image Experiment: Does who politicians pose with affect opinions about them? **YES!**

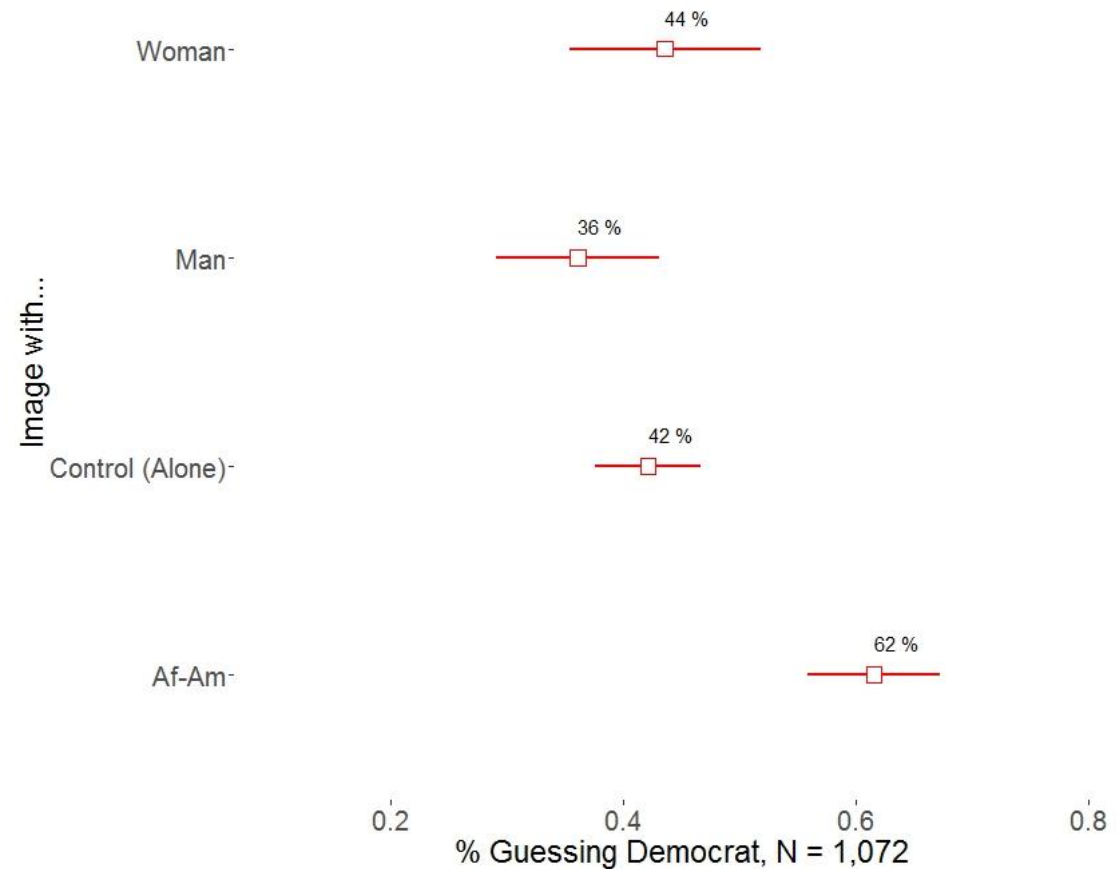
Affects guess  
about  
ideology.





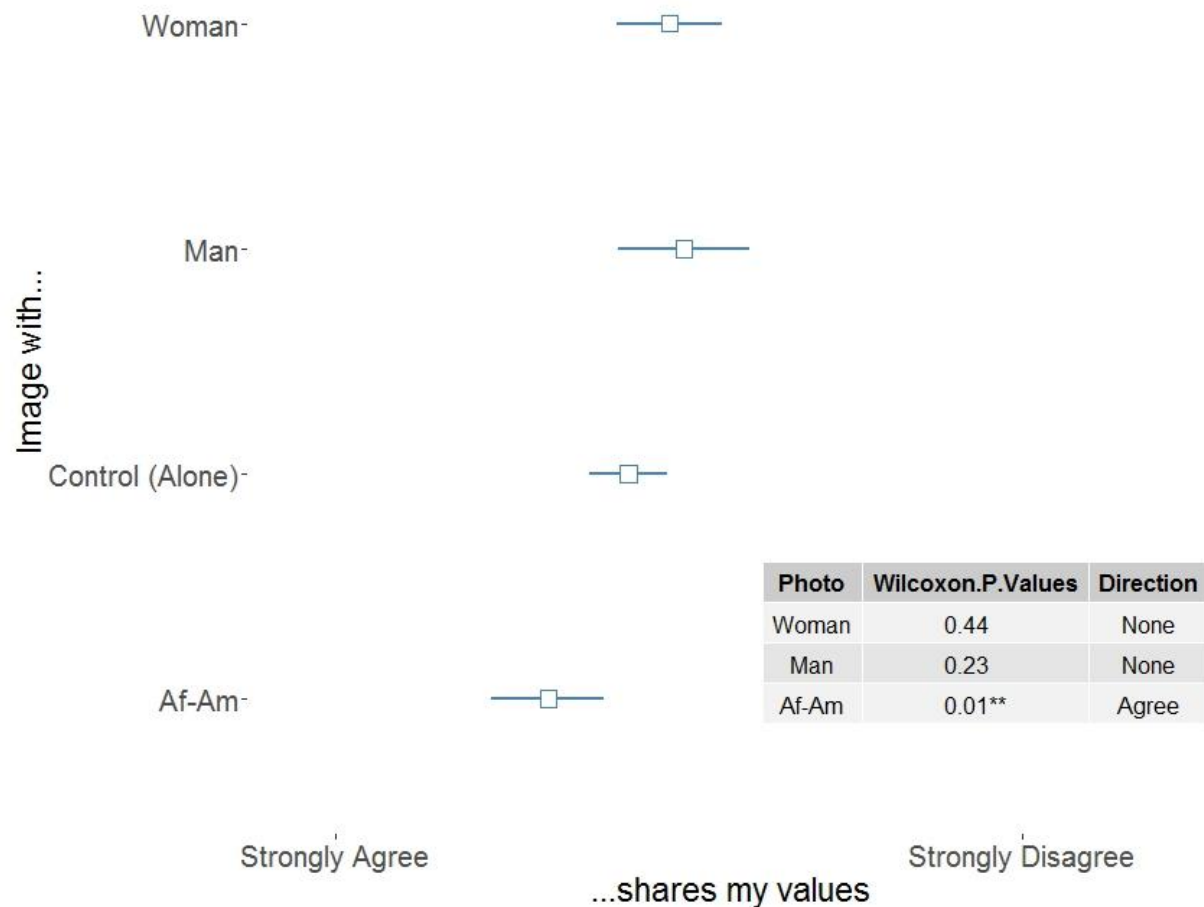
# Image Experiment: Does who politicians pose with affect opinions about them? **YES!**

Affects guess about party.



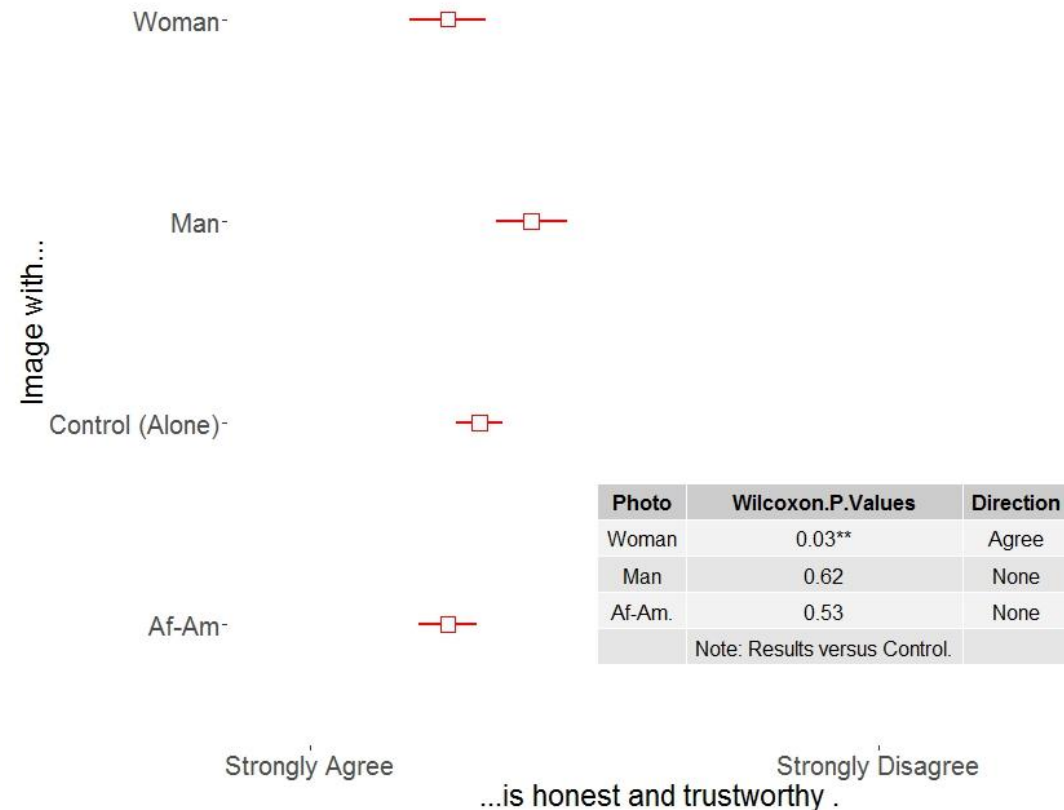
# Image Experiment: Does who politicians pose with affect opinions about them? **YES!**

Affects whether respondents believe that politicians share their values.



# Image Experiment: Does who politicians pose with affect opinions about them? **YES!**

Affects  
perceptions  
about honesty  
and trust.

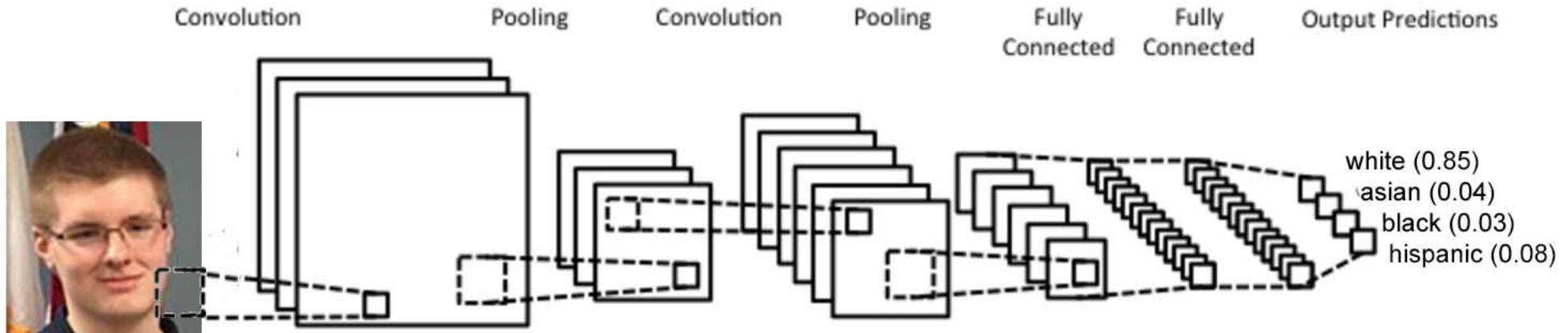


# Do politicians use the people that they pose with in photos differently?

- Specifically, do Democrats and Republicans use race in photos differently?

# Build convolutional neural network classifier to identify race in Congressional images

- Avg. cross-validated accuracy rates of **90%** for whites, **85%** for African-American, **75%** for Asian, **65%** for Hispanic.



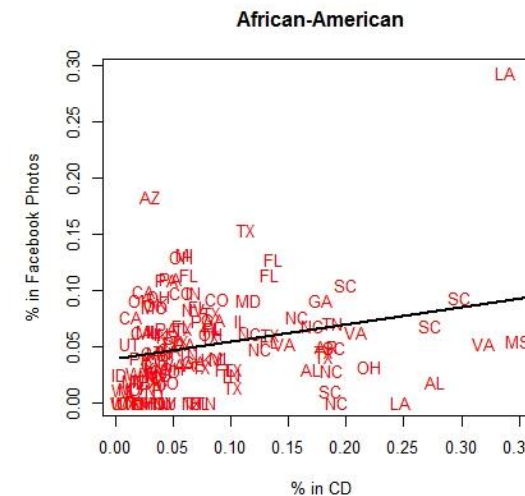
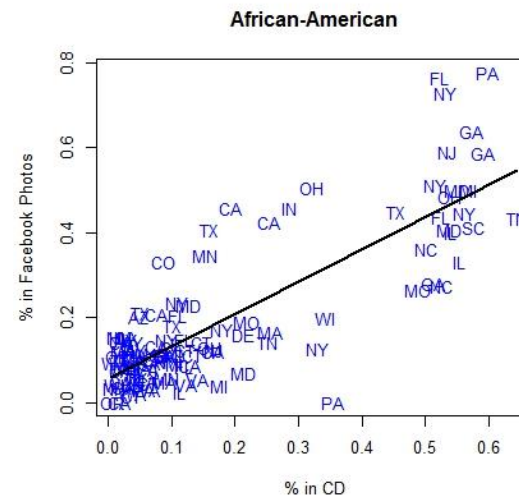
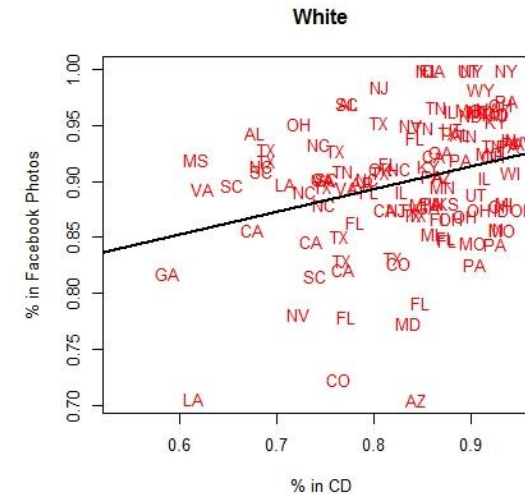
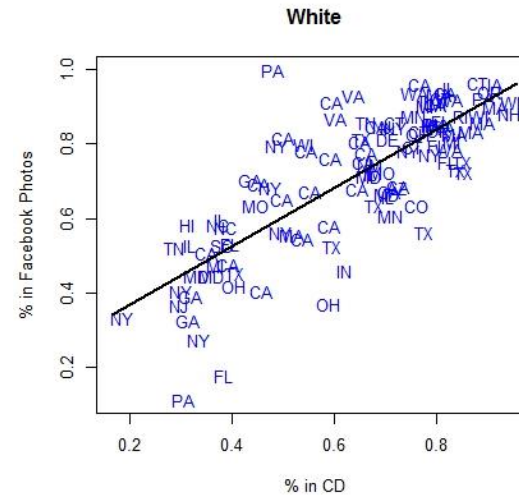


# Explore strategic use of race in photographs posted by Democrats and Republicans

House  
members:  
Congressional  
District  
Demographics

Vs

Facebook  
profile  
“demographics”

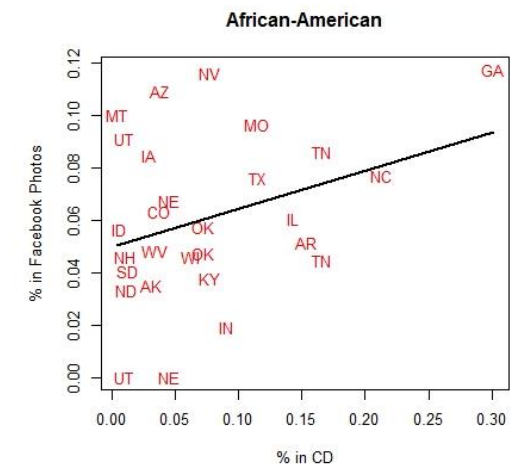
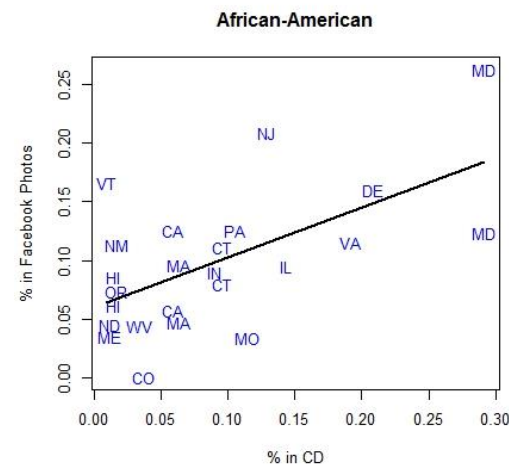
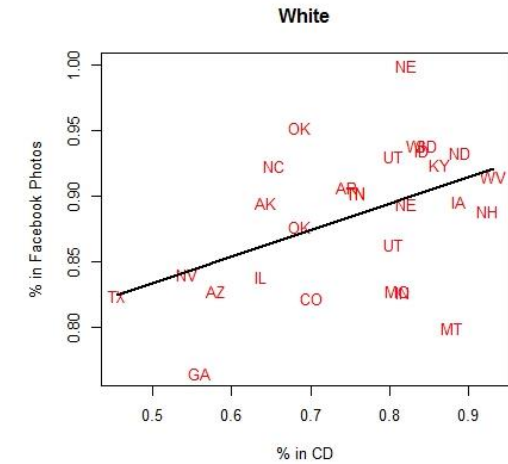
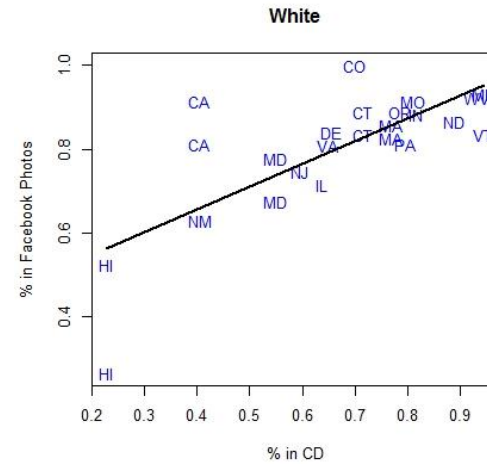


# Explore strategic use of race in photographs posted by Democrats and Republicans

Senate  
members:  
State  
Demographics

Vs

Facebook profile  
“demographics”



# Text Analysis Projects

- Understanding political events through scalable, multi-mode, social action identification. (supervised machine learning, naïve Bayes)
- Putting your money where your statements are: using topic models to explore how changes in stated priorities reflect actual budgetary changes.

# Understanding political events through scalable, multi-mode, social action identification.

- Construct a framework for identifying four types of social/political action.

	PEACEFUL	FORCEFUL
SINGULAR	Individual actions/expressions of actions indicating peaceful intent. (e.g., expressions of empathy or support)	Individual actions/expressions of actions indicating peaceful or forceful intent. (e.g., violence between individuals)
COLLECTIVE	Collective actions/expressions of actions indicating peaceful intent. (e.g. peaceful activity among and between groups)	Collective actions/expressions of actions indicating peaceful or forceful intent. (e.g., violence among and between groups)

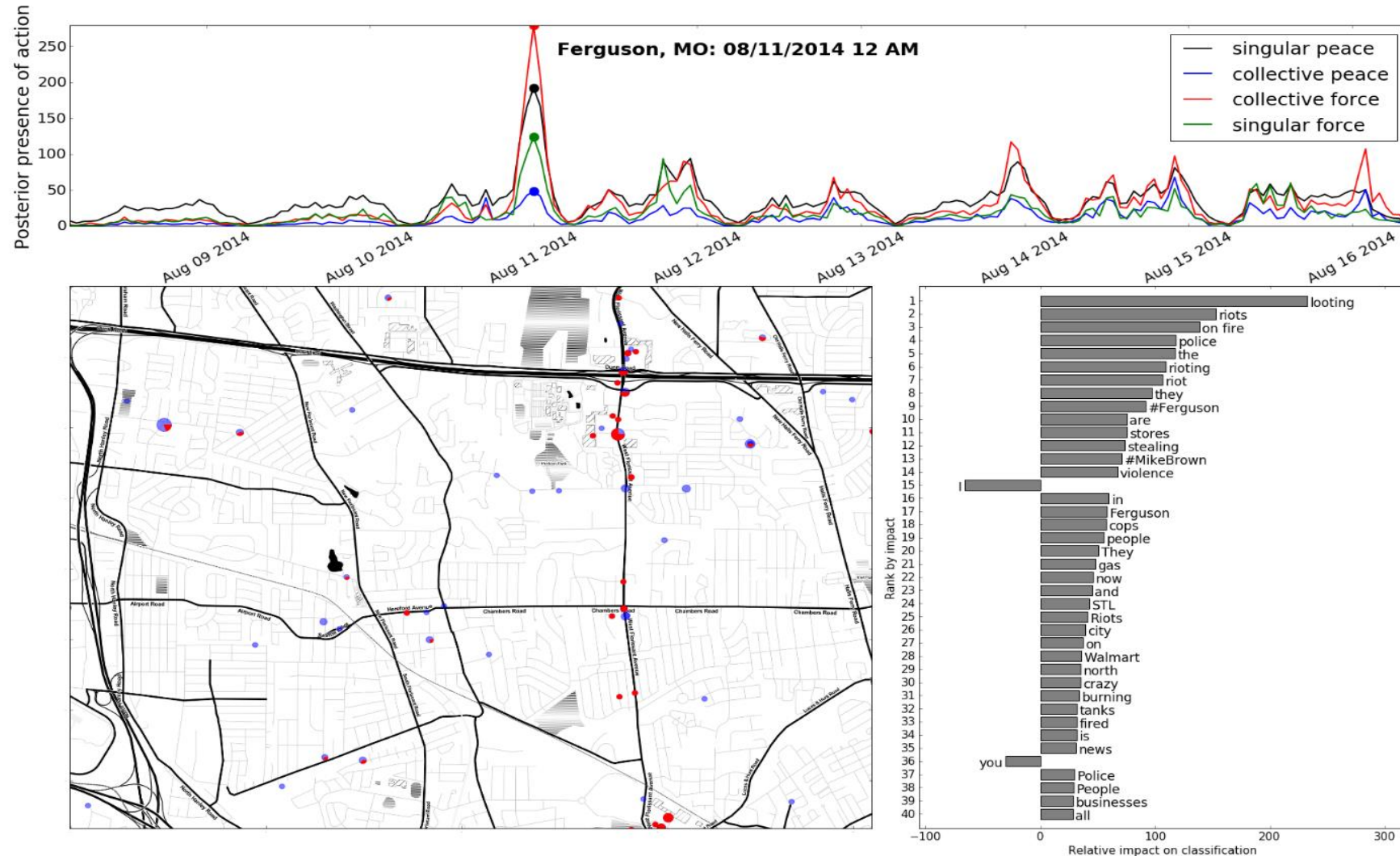
# Understanding political events through scalable, multi-mode, social action identification.

- Using 600 million + geocoded Tweets collected between April 1<sup>st</sup>, 2014 and April 30<sup>th</sup>, 2015.
- Use Associated Press image metadata to “filter” protest related Tweets.
- Train “adept” Bayes classifier to identify different types of social/political actions.

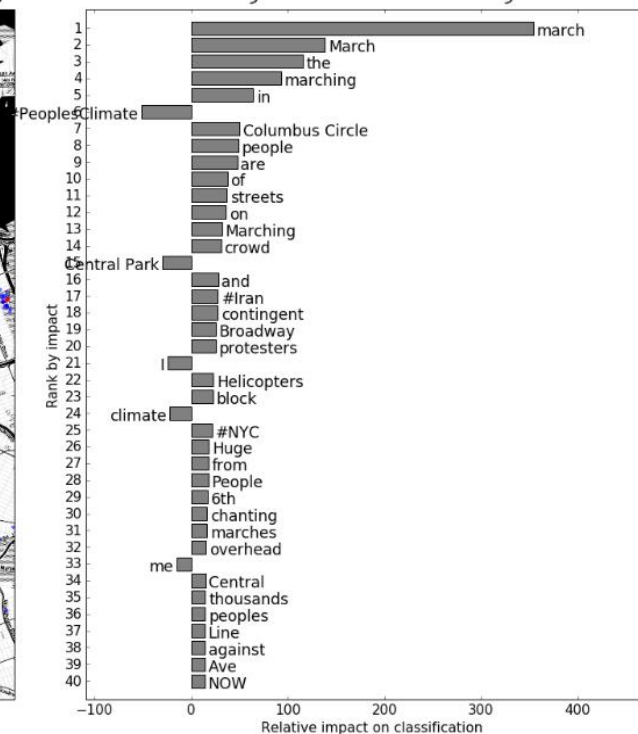
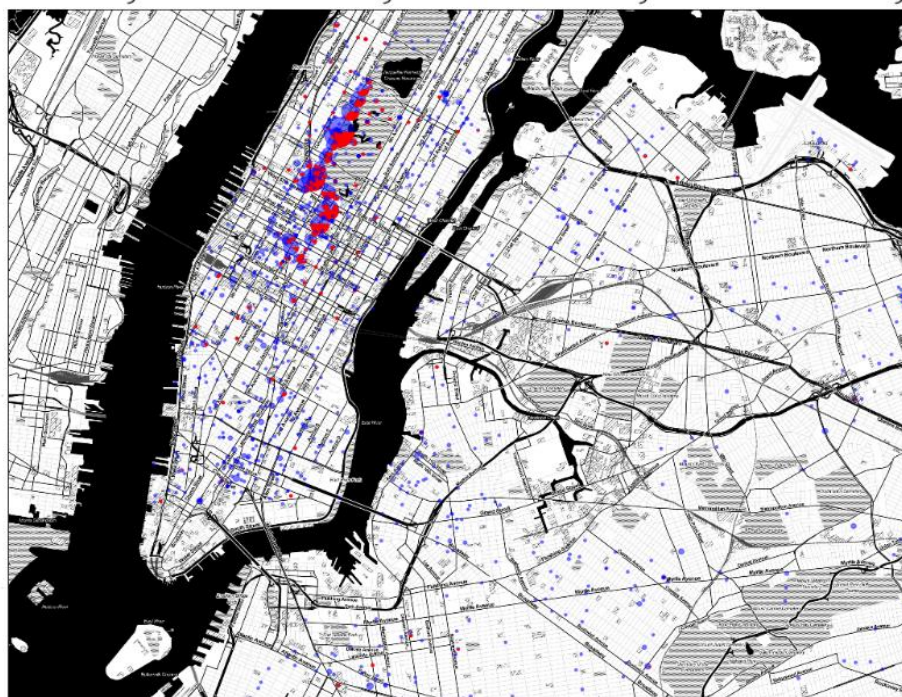
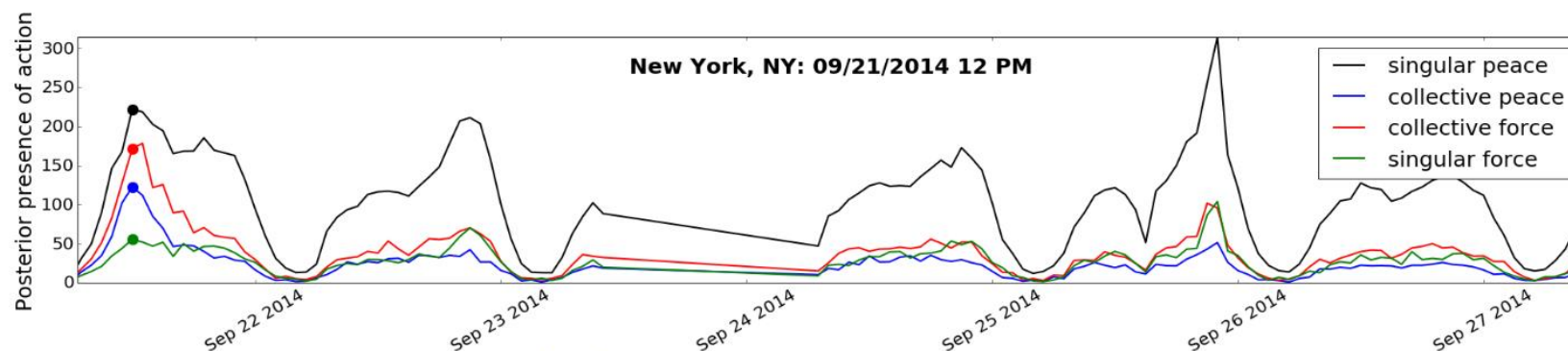




# Ferguson protests, 08/11/2014

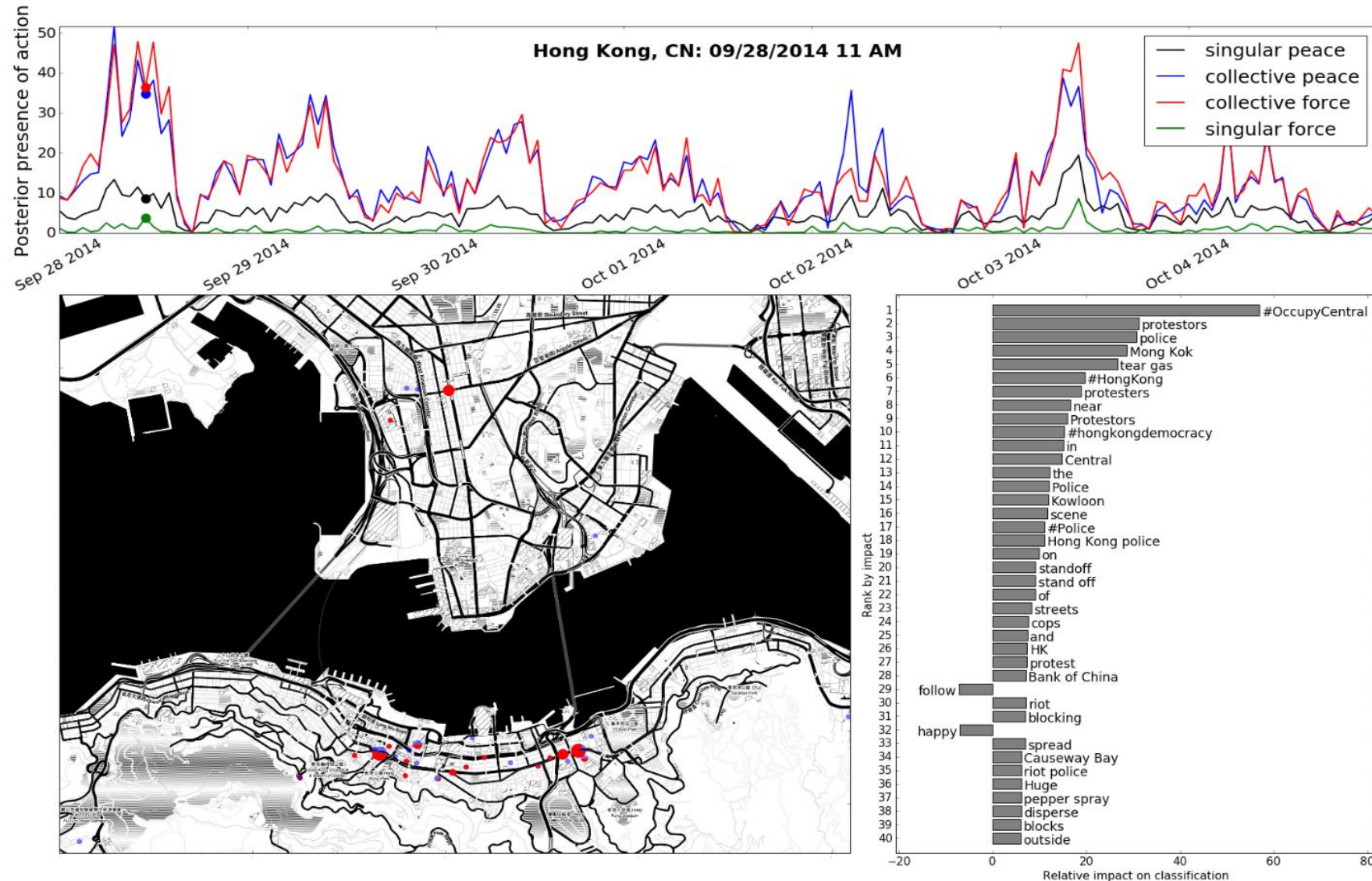


# NYC climate change protests 05/21/2014





# Hong Kong “occupy” protests 09/28/2014



# NYC climate change protests...

