

Metaknowledge Network Spring 2016

Introduction

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About Me

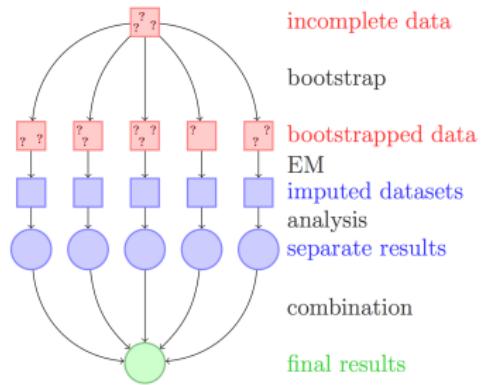
- ▶ Postdoc at Knowledge Lab
- ▶ Econometrics PhD
- ▶ Research Focus:
 - ▶ Quantitative Methods
 - ▶ Public Policy Applications

Projects at Knowledge Lab

- ▶ **Focus:** Matrix Completion and Active Learning
- ▶ **Paper 1: A Matrix Factorization Approach to Multiple Imputation**
(with Madeleine Udell, Nati Srebro, James Evans)
- ▶ **Paper 2: Active Learning applied to Online Social Surveys**
(with Robert Nowak, Sumeet Kataria, James Evans)
- ▶ **Paper 3: Ratings, Rankings or Pairwise Comparisons?**
(with James Evans and Nati Srebro)

Paper 1

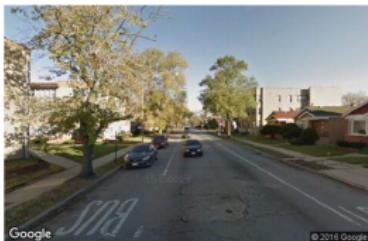
Figure: Multiple Imputation Framework



	LowRank (S)	LowRank (NS)	Trace (FR)	Trace (LR)	MICE
Scaled Loss/(10 ³)	18.50	15.80	14.40	15.80	20.60
%age reduction over MICE	10.10 %	23.40 %	30.10 %	23.00 %	—
%age cols w/ lower loss	73.50 %	84.60 %	87.20 %	84.60 %	—

Paper 2

Which place looks safer ? ▾



Paper 2

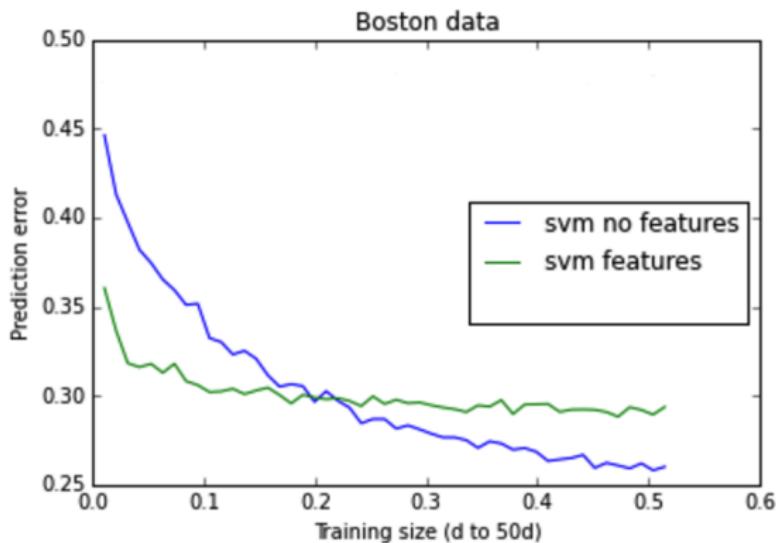
Top 3 Predictors: (office building, apartment building, hospital)



Top 3 Predictors:(yard, residential neighborhood, driveway)



Paper 2



Paper 3

Please rate how funny the following things are.

Not very funny

Very funny

1

2

63

4



SPIKY FLOOR

1

2

3

4

Submit (1 left)

Paper 3

Please rank how funny the following things are

Least funny

Most funny

?

1



SEA CATSNAKE

1

1

1



TRASH PANDA

1

2

1



ICE DANGER FLOOR

3

2

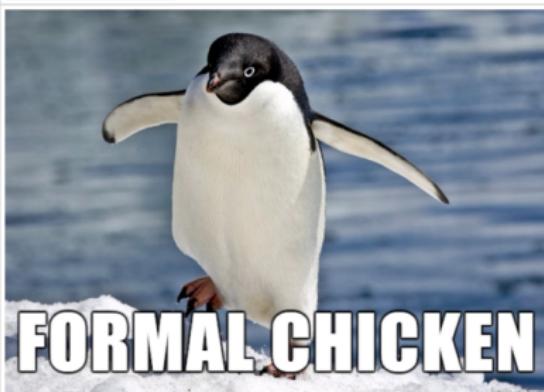
1

Paper 3

Please rank how funny the following things are.



This one is funnier.



This one is funnier.

Going Forward

- ▶ Tensor Completion and Longitudinal Surveys
- ▶ Public Policy Application of Caffe Feature Extraction and Neighborhood Safety

- ▶ Bandits in Public Policy Field Experiments
- ▶ Machine Learning in Causal Inference