IN SEARCH OF THE UNINSURED

VINCE VELOCCI

OCTOBER 28, 2016

MOTIVATION

- There are organizations (Enroll America) whose goal is to reach out to those without health insurance to discuss available options
- Enroll America may work with data science consultancies for insight on how to reach out to those not likely to have health insurance

DATA SCIENCE TO THE RESCUE! HOPEFULLY…

- Data Source: Data on individuals in the country (health ins + lots of demographic features) obtained from Civis Analytics
- You name it: income, age, education, military, state, marital, type of work, vehicles, citizenship
- Over 272,000 labeled data PLUS 188,000 of unlabeled data
- Lots of categories → over 1000 features with dummies
- Can we trust this data? (Self Reporting)

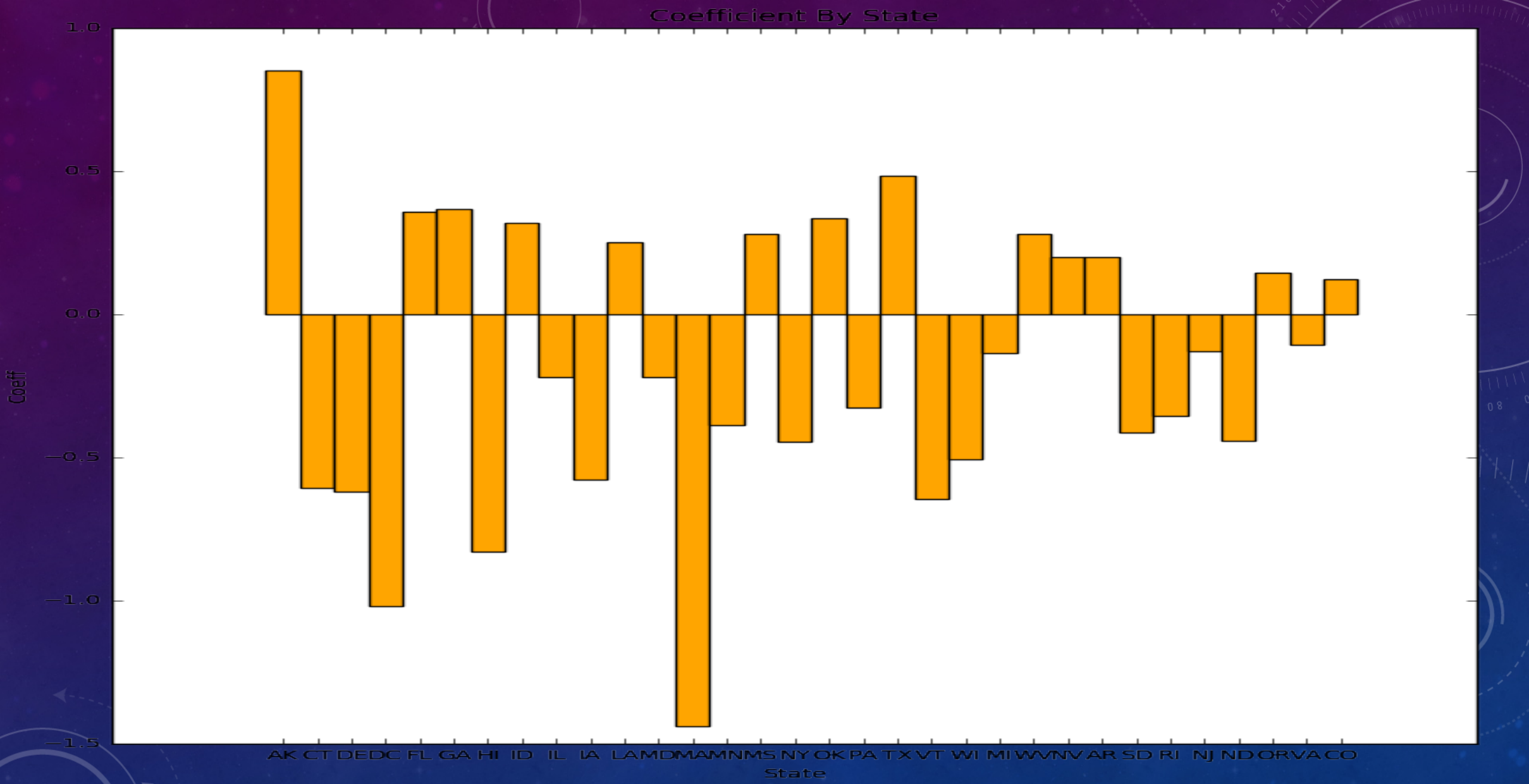
MODELING

- Need to cut down on features:
  - Logistic with penalty
  - PCA

- Tried Random Forest, KNN, Logistic Regression
- BEST MODEL: Logistic Regression with L1 Reg
  - Mean F1 Score = 0.48 ☹ , (5-fold cross val) AUC: 0.84
  - Recall around 0.6 for threshold of 20% ☹
  - Model then trained on full dataset and used to make predictions on unlabeled dataset. Result?

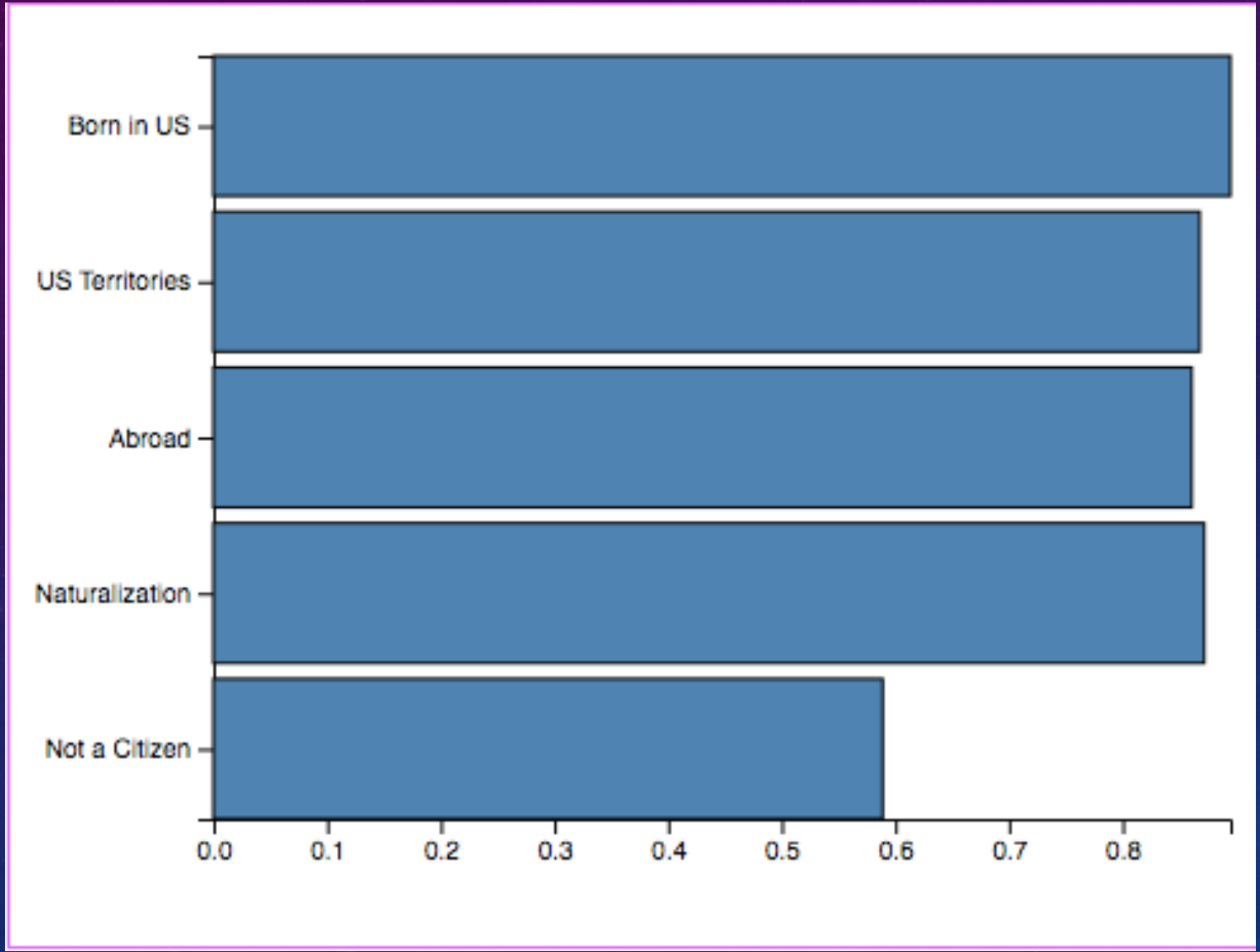
A FEW INSIGHTS?

- Many significant features according to this model
  - Age, # of children in household (negative -> chance of being uninsured down with age & # of children)
  - Not a US Citizen -> More likely uninsured than US Citizens (BUT see last slide)
  - Gov employees & those in their own practice more likely to have ins (negative coefficients)
  - Industries: Fishing, Hunting, Trapping most likely to be uninsured
  - Industries: Aerospace Parts Manuf and Rail Transportation LEAST likely to be uninsured
  - US States: Largest negative coefficient? MA Largest positive coefficient? AK
    - (Quick Google Search shows MA was the state with the largest percentage insured)



- From Left: AK, CT, DE, DC, FL, GA, HI, ID, IL, IA, LA, MD, MA, MN, MS, NY, OK, PA, TX, VT, WI, MI, WV, NV, AR, SD, RI, NJ, ND, OR, VA, CO

MEAN PROBABILITY OF INDIVIDUAL BEING UNINSURED BY CITIZENSHIP FOR UNLABELED SET



THANK YOU!

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