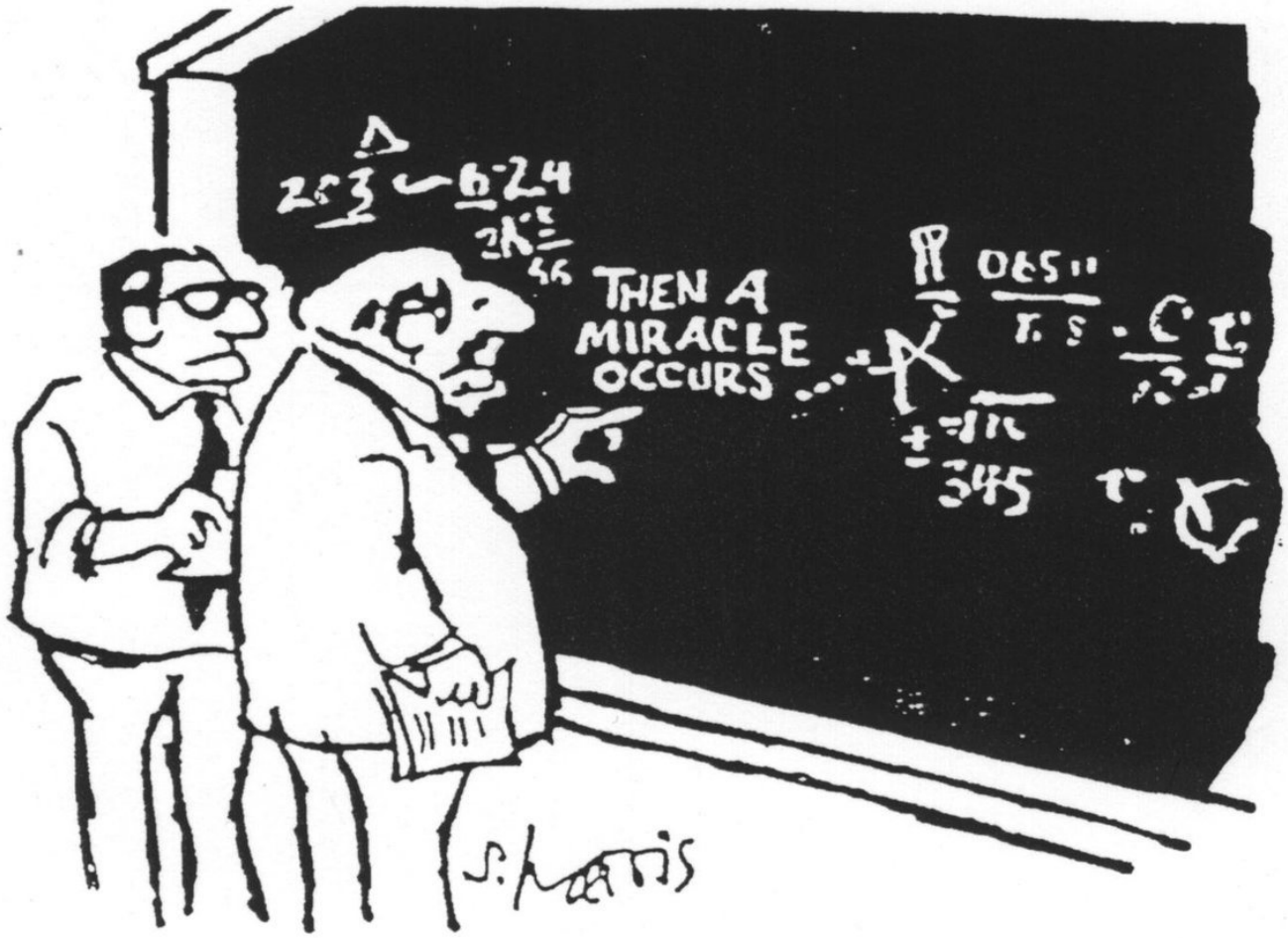


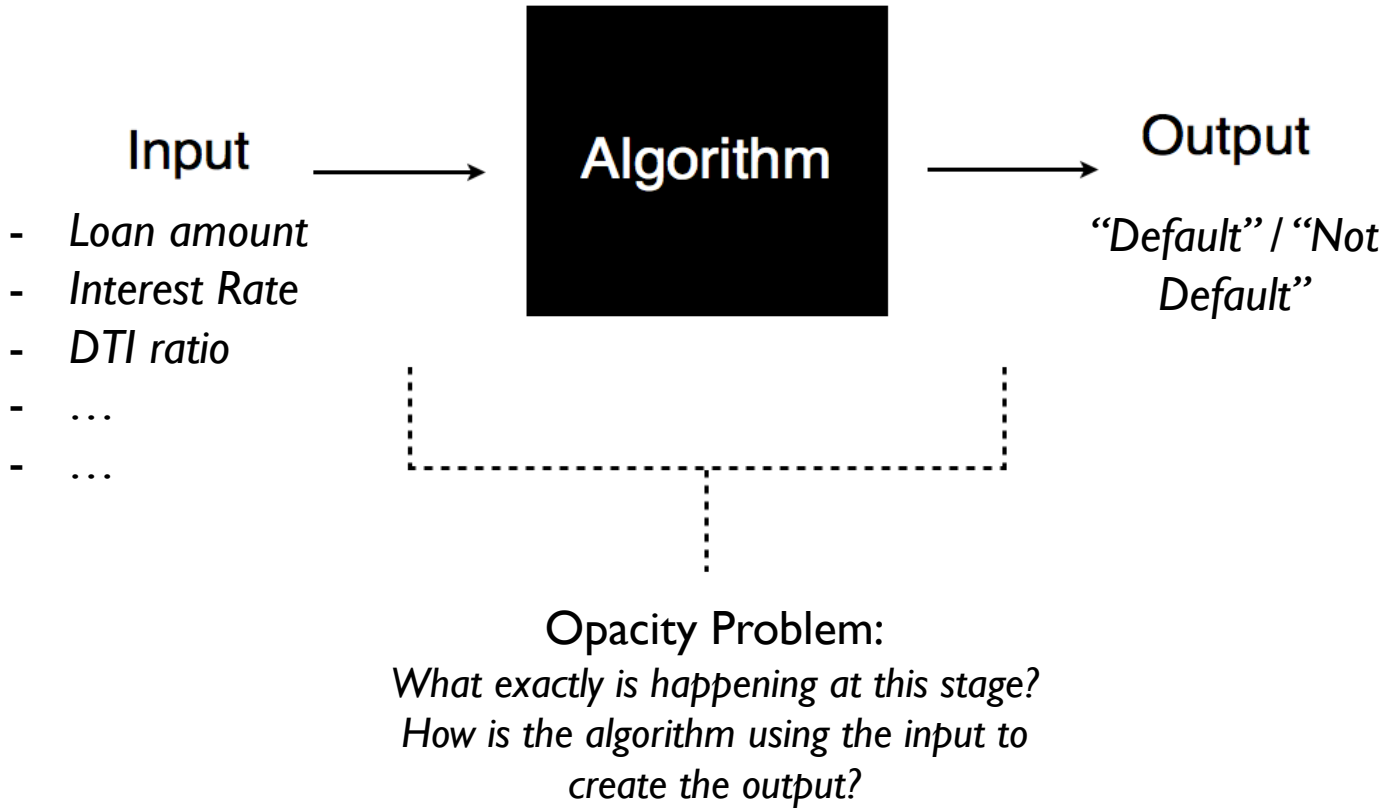
"I think we need to be a little more specific during step 2"

EXPLAINING BLACK BOX CREDIT RISK MODELS

JOSEPH MCHUGH

THE PROBLEM OF EXPLAINABILITY

- Complex machine learning algorithms are being increasingly used by lending institutions
- The lack of explainability that these black box models present has become problematic.



"it is often the case that neither the trained model nor its individual predictions are readily explainable, but regulators and consumers demand explanations"

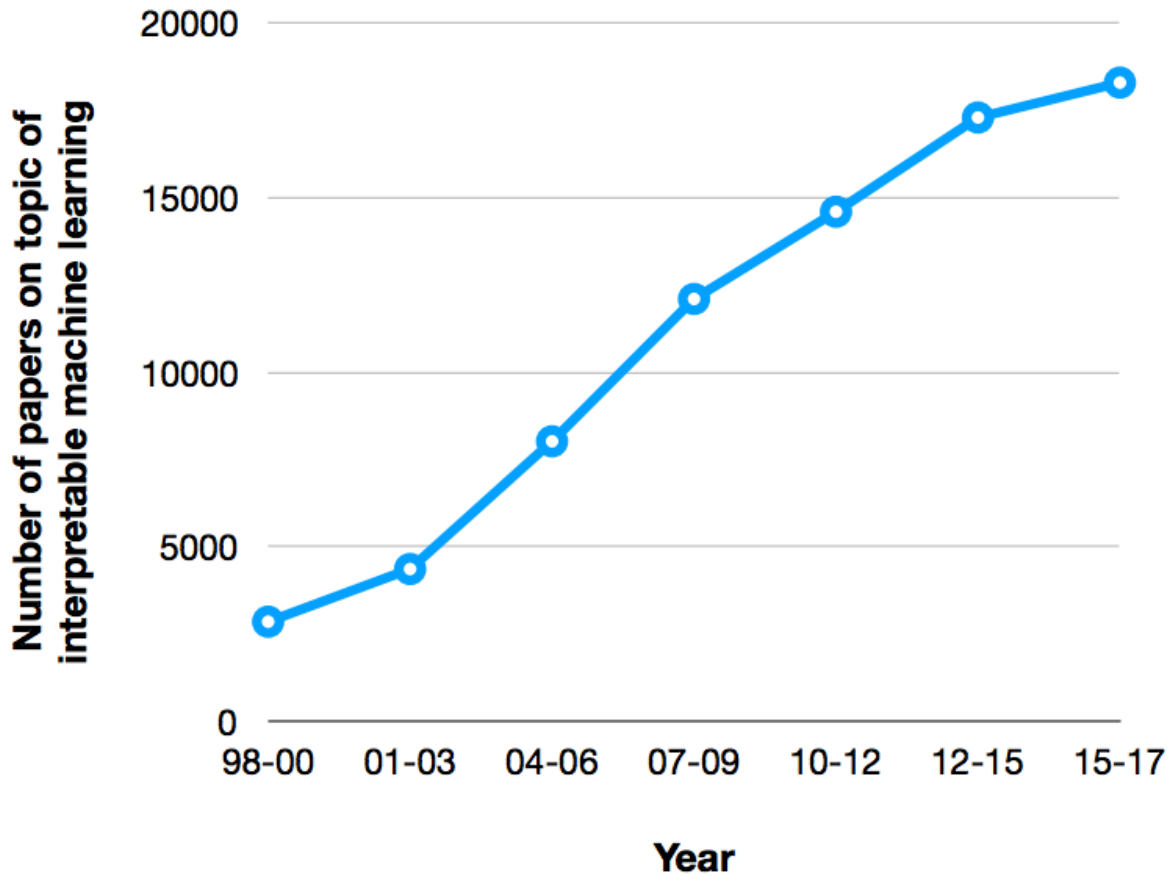
–FICO, 2018

WHY DOES IT MATTER?

1. Regulatory Compliance
2. Customer Understanding

OBJECTIVE: EXPLAIN THE "UNEXPLAINABLE"

- Significant advancement in black box explainability methods.
- Project objective: Apply the most promising of these methods



DATA USED

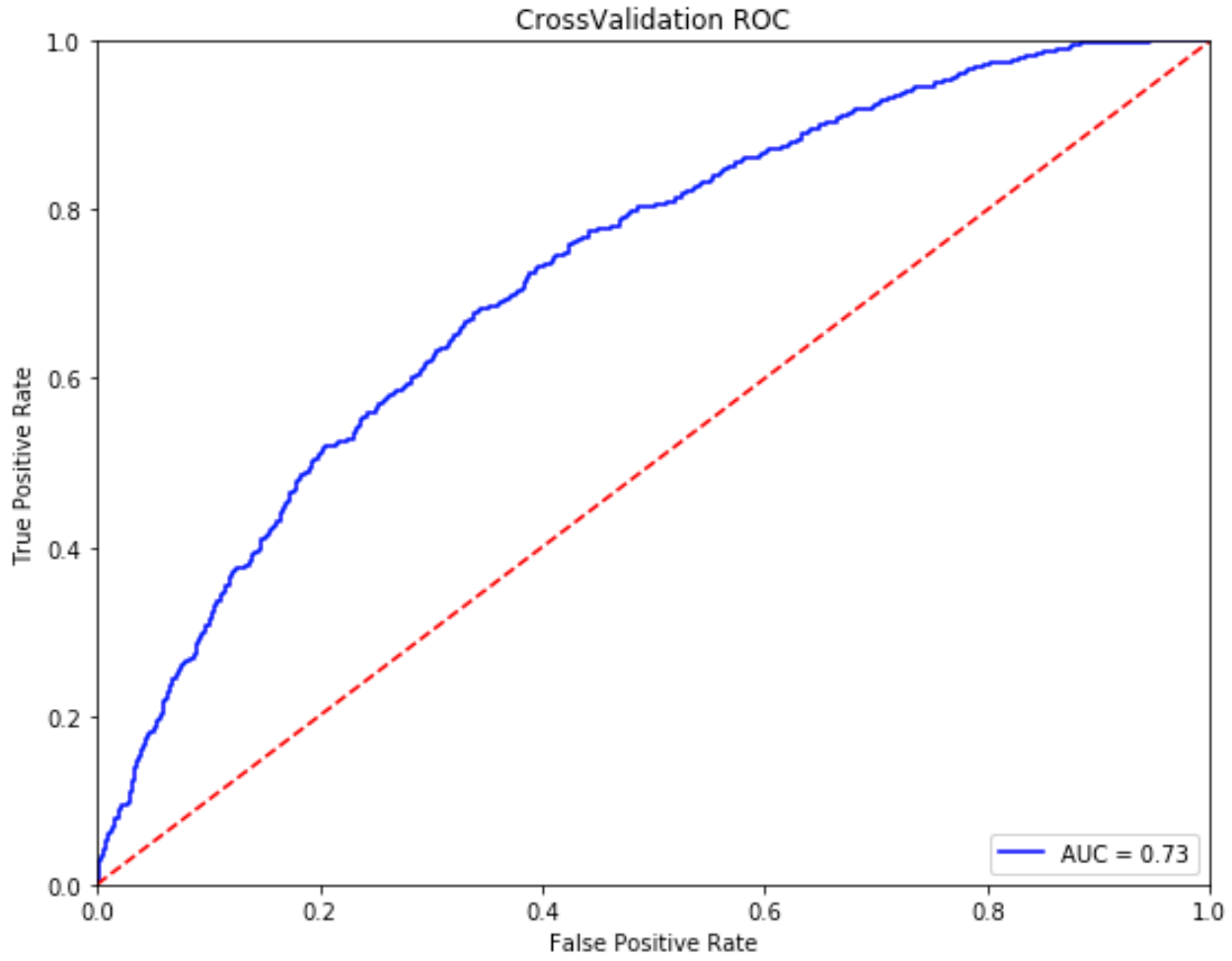
- Lending Club Data
- Period is from 2007-2018
- 2.6 million observations
- 148 feature columns

THE MODELS:

Five models were tested:

- RandomForest Classifier
- GradientBoosting Classifier
- AdaBoosting Classifier
- Bagging Classifier
- Sequential Neural Network

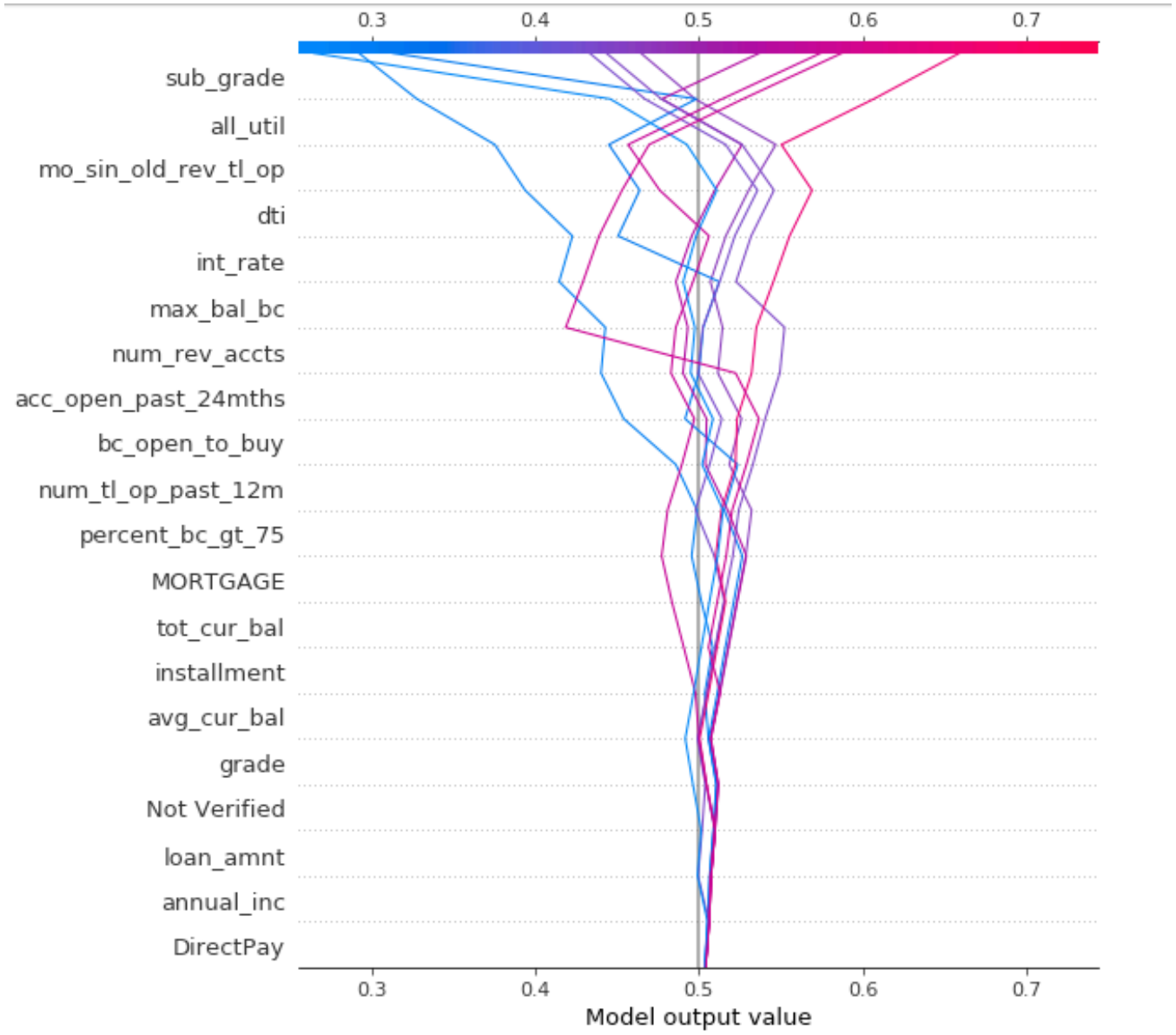
RandomForest



MODEL RESULTS

Note: In the final version I will include the visualizations for all models

USING SHAP VALUES TO OPEN THE BLACK BOX:



MORE IMPORTANTLY: LOCAL EXPLANATIONS