US Visa Application Analysis

Risk assessment for work visas

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Each year, hundreds of thousands of applications are submitted for US work visas.

The problem

Each year there is a lottery to have visa applications considered, so rejections are very costly.

The solution

Reduce the risk of application rejection as much as possible.

Employers can screen applicants and select those with the highest chances of success for the visa lottery.

How it works

Step 1

Build models

Application data from the US department of labor is analyzed to create a model that predicts the risk of rejection for new applications.

Step 2

Make predictions

New applications are fed to the model, and assessed as risky or not.

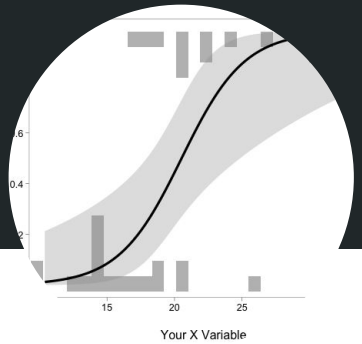
Step 3

Make decisions

Employers can choose the applicants with the lowest risk or receive advice for how to strengthen a weak application.

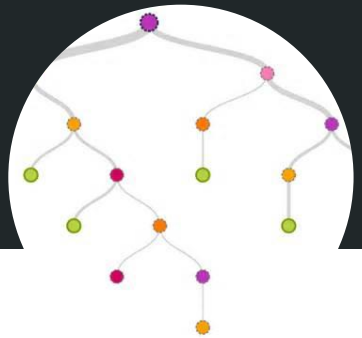

The
Technology
Machine
Learning

The Models



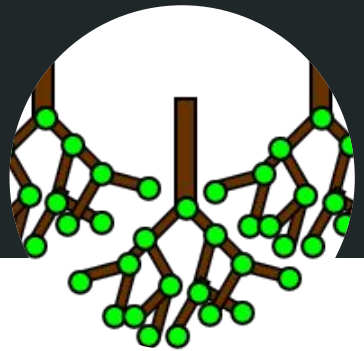
Logistic Regression

Creates a coefficient for each feature, showing which have the strongest positive and negative effects.



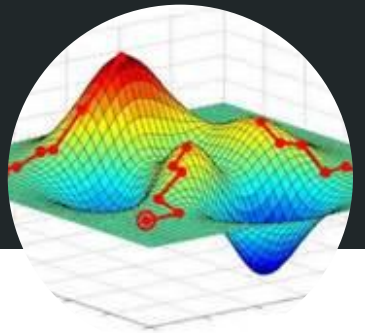
Decision Tree

Determines which features have the most importance to application decisions



Random Forest

Creates a random forest of decision trees and chooses the best one.



Gradient Boosting

Starts with a base decision tree and iteratively improves it.

How to combine the models?

7% ⇒ 24%

Risk of rejection for unclassified and classified applications

Technical Details for Nerds

Null Risk: 6.7%

	Logistic Regression	Decision Tree	Random Forest	Gradient Boosting	Voting
Precision	.18	.34	.31	.23	.24
Recall	.51	.51	.51	.51	.58

Insights

Specialists Wanted

High pay

- prevailing wages
- high offers

Education and experience

- master's degrees
- university positions
- related experience

Worker Protections

Low pay

- low offers

Working Conditions

- domestic workers
- living on site

Client Recommendations

Change visa type

H-1B has high rates of success

Raise pay

High-paying offers are rejected less

Raise required education

Requiring at least a Bachelor's will help an application

Go to the pros

Having a professional prepare the application can help greatly

Next Steps

- Web application
  - Tailored recommendations
    - Bulk application screening
      - Analyze other application processes