

Recidivism Analysis: Bias in AI Criminality Assessments

Michigan Data Science Team Fall 2025
Mid-Semester Expo



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Background

A Brief History of COMPAS and Its Shortcomings



What is “Recidivism”?

WORD OF THE DAY

JULY 6, 2022

recidivism

noun | rih-SID-uh-viz-um

relapse into criminal behavior

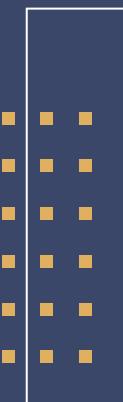


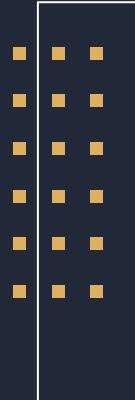
m-w.com/word-of-the-day



What is COMPAS?

- The COMPAS (Correctional Offender Management Profiling for Alternative Sanctions) algorithm is a **risk assessment algorithm** that predicts whether a criminal will recidivate in the next 1-3 years
- Risk assessment algorithms are used in the criminal justice system to predict the chance of a certain event
 - Not showing up to trial, reoffending, etc.
 - COMPAS is one of the largest , which focuses on reoffenders (recidivism)
- This project explores the algorithm's potential **biases against different demographic groups**, with a particular focus on racial disparities





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Progress Update

What we have accomplished as a team so far

Topics Covered

Data Cleaning & Exploration

Cleaned the COMPAS dataset using Pandas, addressing issues such as missing values, naming, and value types.

Conducted EDA on the dataset to understand its variables, content, and structure.

Error Bias & Analysis

Used confusion matrices to understand errors in the COMPAS model such as false positives and negatives.

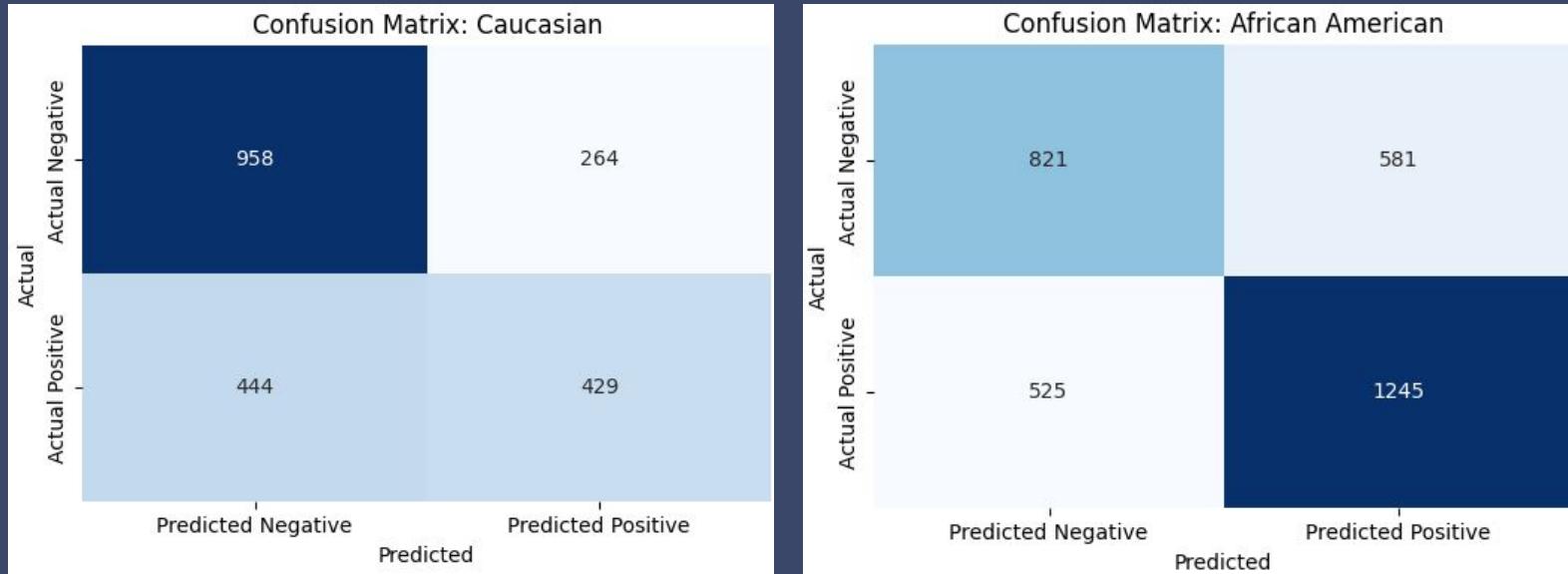
Analyzed bias within different demographics by using performance metrics

Logistic Regression

Looked at how different factors influence scores given by the COMPAS algorithm (High vs. Low)

Logistic Regression also allowed us to adjust for confounding variables in our analysis.

Our Findings



False Negative rates and False positive rates differ:

- False negative rates 23% higher for white defendants
- False positive rates 45% higher for black defendants

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Next Steps

Where we plan to take our project in the coming weeks



Remaining Weeks Overview



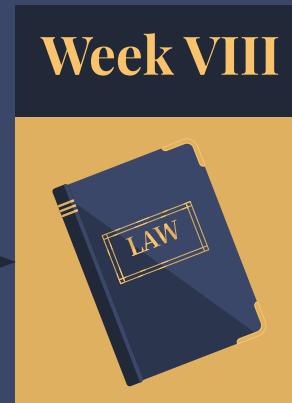
Cox Proportional Hazards - Testing how Variables Influence Recidivism Risk over Time



Kaplan-Meier Curves - Differentiating Risk across Groups over Time



Subgroup Work Session #1 - Brainstorm Ideas and Explore Possibilities



Subgroup Work Session #2 - Research Topics and Finalize Presentations

Thank You!

Do you have any questions?

Feel free to ask us now, or you can send us emails at:

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**BEST OF LUCK WITH YOUR PROJECTS
THIS SEMESTER!!**

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