ABOUT ME

01 Background
BA Arch. Texas Tech / AAS CAD EPCC

02 Teaching
9th Grade Principles of Applied Engineering / Founded 4-year Engineering HS Program

03 Institution
CRSHH, Circles, Cohorts/Houses, Community

04 Professional Situation
Working for lead position: District STEAM Coordinator
ABOUT THE PROJECT

Investigate machine bias within the COMPAS (Correctional Offender Management Profiling for Alternative Sanctions) software’s data

False positives were damaging for the defendants, simply because the software stated they would reoffend and they did not; on the other hand, false negatives had the chance of being harmful for law enforcement, since the software assumed the defendant would not reoffend and they did.
Bias within Artificial Intelligence is usually stemmed from learned behaviors, whether from provided previous patterns, or programmer knowledge. Identifying these flaws can help understand machine learning and equality in its service.

My role:

Interpret and summarize the code & data into an explanatory written format.
RESEARCH OBJECTIVES

- How does logistic regression replicate or reinforce bias in comparison to the bias presented in the original data set?

- How do the outcomes differ/align among different demographic groups when comparing at different cut-offs (decile scores 6, 7, and 8) in the analysis?

- How does training the data set on different machine learning algorithms affect the impact the bias has on the observed models?
RESULTS

Defendants' Decile Scores by Race

- White Defendants
- Black Defendants
- Hispanic Defendants

False Positive Rates by Race for Decile Score 6

False Negative Rates by Race for Decile Score 6

True Positive Rates by Race for Decile Score 6
RELEVANCE OF RESEARCH PROJECT

While understanding how Artificial Intelligence is programmed, the students will also be able to identify how its modified uses can have impacts on local and global societies. It is important for students to be able to identify that a computer’s “intelligence” is only as immense as the programmers working on its coding.
(5) The student describes the factors that affect the progression of technology and the potential intended and unintended consequences of technological advances. The student is expected to:

(5)(A) describe how technology has affected individuals, societies, cultures, economies, and environments

(5)(B) describe how the development and use of technology influenced past events

(5)(C) describe how and why technology progresses

(5)(D) predict possible changes caused by the advances of technology

PROJECT TIME: Total time to complete all topics: approximately 6 weeks. Class times may run about 60-90 minutes long.
<table>
<thead>
<tr>
<th>TOPICS</th>
<th>(5)(C) describe how and why technology progresses:</th>
<th>(5)(D) predict possible changes caused by the advances of technology:</th>
<th>(5)(B) describe how the development and use of technology influenced past events:</th>
<th>(5)(A) describe how technology has affected individuals, societies, cultures, economies, and environments:</th>
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<tr>
<td>15 minute practice every class in CodingBat Python</td>
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<td>Programmer intelligence</td>
<td>Control over every-day environment (smart home, virtual assistants, etc.)</td>
<td>Al bias examples</td>
<td>COMPAS Machine Bias</td>
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<td>History of AI and uses in pop culture</td>
<td>Cybersecurity, privacy, programmed bias</td>
<td>Cyber threats, real-world consequences</td>
<td>Use python to analyze data and identify patterns of bias through the separation of sex, race, and offense.</td>
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<td>Analyze how this inaccuracy can positively and negatively affect society, the defendants’ lives, the victims’ lives, and the justice system.</td>
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ASSESSMENTS

Multiple Choice Questions

- Vocabulary knowledge
- Responses to scenarios
- Cause and effect (cyber threats, AI bias examples)
ASSESSMENTS

Fill in the blanks

- Timeline for development of AI
- Matching activities with Cyber Attacks
ASSESSMENTS

Short/Open Response

- Analyze and explain the importance of programmer intelligence.
- Explain the influence of AI in pop culture.
- Describe the benefits and drawbacks of relying on technology.
- Write a prediction of what might happen when connecting to a public network.
- Describe one type of cyber attack, its consequences, and the process for recovery.
Analyze how AI inaccuracy can positively and negatively affect society, the defendants’ lives, the victims’ lives, and the justice system.

Explain the idea and development of Artificial Intelligence from the early 1900’s to modern day application.

Develop an argument explaining the consequences of cyber threats and the importance of preventing cyber attacks.
Concluding Remarks
TAKEAWAYS FROM THE INSTITUTE

1. Teaching strategies, problem-solving activities, student engagement

2. Deeper understanding of Python and Algorithms (Deutsch-Jozsa)

3. Confidence in bringing awareness to the importance of Cybersecurity
PYTHON PROGRAMMING, MACHINE LEARNING, & AI BIAS
Alezzandra Diaz // El Paso Leadership Academy
East HS

2023 CREEDS Summer Institute
The University of Texas at El Paso