Does an algorithm that codes linguistic data perform differently for Black and White speakers?

Motivation

• **Coding**, categorizing linguistic options (e.g., "car" vs "cah"), is an important but time-intensive step in sociolinguistic research.
• Villarreal et al. (2020) used machine learning (random forests) to automate coding based on sound properties.
• Auto-codes matched listener judgments (Fig. 1).
• Other AI applications perform worse for Black than White individuals—what about this auto-coding algorithm?

Project Description

• Data: ~11,000 tokens of (r) (e.g., "car" vs "cah") from Black and White speakers of New England English.
• Procedure: Run auto-coders with different unfairness mitigation strategies.
• Goal: Assess how these strategies affect fairness (disparity in coding accuracy).

Context

• In domains like criminal justice (Angwin et al. 2016) and ASR (Koenenke et al. 2020), algorithms tend to perform worse on Black than White individuals.
• AI fairness is inherently in tension with performance (Kleinberg et al. 2017).
• These investigations tend to happen after algorithms are in wide use, making AI fairness an afterthought.

Project Deliverables

• Expand our understanding of the limitations of sociolinguistic auto-coding.
• Open up new avenues of research into how intergroup acoustic differences translate to auto-coding performance.
• Data preparation complete by August 2021, analysis by January 2022, submission to *Linguistics Vanguard* by April 2022.
• Next step: Apply for NSF Fairness in AI grant in summer 2022.

Potential Impact

• Introduces AI fairness to a new algorithm in its infancy rather than waiting until it is in wide use.
• Interrupt trend by which new AI methods increase and reproduce racial injustice.
• Broaden AI fairness research to a domain with different stakes.
• Increase viability of a time-saving method for sociolinguistic research.

References

Angwin, Julia, Jeff Larson, Surya Mattu & Lauren Kirchner. 2016. Machine bias: There’s software used across the country to predict future criminals. And it’s biased against blacks. In ProPublica.


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Overlearning speaker race in sociolinguistic auto-coding

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