

MITIGATING RACIAL BIAS IN THE USE OF FACIAL RECOGNITION TECHNOLOGY
BY U.S. LAW ENFORCEMENT

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Introduction

As artificial intelligence (AI) systems, including facial recognition systems, become more advanced, they are also becoming more widely used. A recent report prepared for the U.S. Congress notes that facial recognition technology is being used by the Federal Bureau of Investigation (FBI), the Department of Homeland Security (DHS), the Customs and Border Protection (CBP) agency, as well as state and local police authorities (Finklea, 2020). Jennifer Lynch, Senior Staff Attorney for the Electronic Frontier Foundation, states that the adoption of facial recognition technology into law enforcement in particular is “increasing rapidly” (Lynch, 2020). Indeed, Clare Garvie of the Georgetown Center on Privacy and Technology reports that at least twenty-six states allow their law enforcement to run facial recognition algorithms through their databases, which consist of driver's licenses and ID photos (Garvie et al., 2016).

The advanced capabilities of facial recognition technology allow law enforcement to identify criminals who might otherwise not be caught. However, current facial recognition technology is flawed because many of the algorithms governing these systems have been shown to be significantly less accurate at identifying individuals from certain racial groups, especially African Americans. These biases have been attributed, in part, to demographic imbalances in the training data sets for these algorithms. This paper will overview the pros and cons of the use of facial recognition in U.S. law enforcement, and suggest the use of diverse training sets as an approach to mitigating the bias against African Americans present in facial recognition systems.

Benefits of Facial Recognition Systems

Facial recognition has the potential to provide crucial benefits to law enforcement and society more broadly. One benefit of facial recognition systems is that they can be more effective at identifying faces than the human eye. In 2015, computer scientist Chaochao Lu of Cambridge

University found a facial recognition algorithm to perform at a higher accuracy rate than humans when identifying faces (Lu et al., 2015), and facial recognition algorithms have only become more accurate since then. In another study on the relative effectiveness of these systems across race and ethnic groups, Joseph Robinson of Northeastern University reports that face recognition algorithms were 150% more accurate than humans when distinguishing between Chinese, Japanese, and Korean faces (Robinson et al., 2020).

Improved accuracy in recognizing faces is important because it allows law enforcement to prevent criminals from doing future harm. As the New York Times reported, in 2018, the Maryland police force resorted to using facial recognition algorithms and successfully incriminated the Capital Gazette shooter (Metz et al., 2018). Had facial recognition technology been unavailable, the shooter may have been unidentified, posing future risks to society.

In addition, the use of facial recognition systems has the potential to alleviate the bias that exists against African Americans in law enforcement. Currently, as explained by Samuel Gross, a law professor at the University of Michigan who worked with the National Association for the Advancement of Colored People (NAACP) as a defense lawyer and therefore has extensive knowledge on this subject, African Americans are disproportionately falsely accused of crimes, constituting 47% of the total exonerations despite only making up 13% of the population (Gross et al., 2017). However, African Americans could be protected from such false accusations if facial recognition systems could reliably identify the true suspect. Furthermore, similar uses of AI to protect individuals from bias have been suggested in other areas of law enforcement, which illustrates this technology's great potential in this area. For example, Maria Noriega, a cyber intelligence analyst from the University of Oslo, argues that the implementation of AI in law

enforcement's interrogation rooms would help protect people from the racial biases of their interrogators (Noriega, 2020).

Drawbacks of Facial Recognition Systems

Despite the benefits of facial recognition systems for law enforcement, the bias displayed by many facial recognition algorithms is a major concern. Brendan Klare, a computer scientist at Michigan State University, found that six major facial recognition algorithms are substantially less accurate on African Americans (Klare et al., 2012). A later report by the National Institute of Standards determined that this is a strong trend, finding similar disparities in 189 different facial recognition systems (Grother, 2019).

Errors in facial recognition technology are particularly harmful in the context of law enforcement because being falsely accused of a crime can have irreversible consequences on people's lives. As one example of this, a Black man named Robert Williams was arrested after being mistakenly identified as a thief by the Michigan State Police's facial recognition software (Burton-Harris et al., 2020). As a result, his fingerprints, mugshot, and DNA samples are now all on file in the police department, and the encounter put a strain on his interpersonal relationships (Burton-Harris et al., 2020).

Continuing to introduce biased facial recognition systems into law enforcement will exacerbate the racial discrimination that already exists in America's law enforcement, and could cause harm through false accusations. Additionally, the increase in racial equity that facial recognition could provide to law enforcement, as discussed earlier, can only be achieved through the use of systems that can accurately identify all demographics. Thus, efforts to mitigate the bias present in these systems are necessary, as discussed below.

Mitigating Bias in Facial Recognition Systems

Many datasets used to train facial recognition algorithms are flawed in that they often lack sufficient high-quality data from certain demographic groups, especially African Americans. This is concerning because the accuracy of these algorithms depends heavily on the data used to train them. As explained by Michele Merler, AI researcher at IBM TJ Watson, “For face recognition to perform as desired — to be both accurate and fair — training data must provide sufficient balance and coverage” (Merler et al., 2019). Indeed, two widely used training sets, IJB-A and Adience, are overwhelmingly composed of lighter-skinned subjects (79.6% for IJB-A and 86.2% for Adience) according to Joy Buolamwini, a computer scientist at MIT and founder of the Algorithmic Justice League, an organization that specializes in spreading awareness of the racial, sexist, and other discriminatory issues surrounding AI (Buolamwini and Gebru, 2018). This in turn harmed the performance of three commercial facial recognition systems that used this data, which exhibited an increased error rate of up to 19% for darker-skinned people (Buolamwini and Gebru, 2018).

Given the inaccuracy in algorithms that arises from having imbalanced training sets, one possible approach to mitigating bias in facial recognition algorithms is to train them with more diverse datasets. Indeed, algorithms with training sets that are “evenly distributed across demographics” have “consistently higher accuracy,” according to Brendan Klare, a computer scientist at Michigan State University (Klare et al., 2012).

Conclusion

The current bias against African Americans in facial recognition technology raises concerns about its continued use in U.S. law enforcement. However, due to its potential to increase the security of American society as a whole, it is arguably better to improve this technology than to abandon it completely. One potential improvement is balancing the training

datasets for these algorithms, as the composition of these datasets is directly related to a facial recognition algorithm's accuracy. The issues that arise from the use of facial recognition technology in U.S. law enforcement demonstrate that it is imperative to check advancements in AI from an ethical standpoint as this technology becomes more powerful.

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