Literature Review of Sampling and Evaluation Bias in Facial Analysis and
Recognition Algorithms
(Technical Report)

Civic Life Sentence: How Critics of Felony Disenfranchisement Pursue Reform
(STS Research Paper)

An Undergraduate Thesis Portfolio
Presented to the Faculty of the
School of Engineering and Applied Science
In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Major

by

Hana Nur

May 10, 2021

Preface

How can institutionalized discrimination in the United States be reduced? In facial recognition algorithms, discrimination shapes the datasets and development that inform and guide applications, thereby encoding biases. In the U.S. criminal justice system, such discrimination is exacerbated and perpetuated through felony disenfranchisement laws.

The technical project aims to analyze the sources of sampling bias and evaluation bias responsible for discrimination in facial recognition algorithms. In the field of facial recognition, bias can occur throughout data collection as well as the development process. This can lead to sampling bias, which occurs when data used for a machine learning model is not randomly sampled, or evaluation bias, which occurs when an algorithm includes ill-fitting criterion. Previous work investigated facial recognition applications found to discriminate against those with non-Caucasian features, ranging from differences in skin tone to eye shape. In analyzing existing literature in the field in order to determine collective findings and disagreements, this project will aid future research into solutions for reducing bias.

Critics of felony disenfranchisement mobilize to reform legislation. Through documenting discriminatory impacts of felony disenfranchisement, reformers are provided with the necessary evidence for its abolition. Reframing felony disenfranchisement as a civil rights issue raises questions around the legitimacy of penal disenfranchisement in a democratic society. U.S. Supreme Court decisions of *Shelby County v. Holder* (2013) and *Richardson v. Ramirez* (1974) affirmed the constitutionality of state-sanctioned disenfranchisement, therefore critics challenge felony disenfranchisement legislation on the state-level through collective action.

List of Contents