

Thesis Project Portfolio

Lowcode: Innovative Web App Development

(Technical Report)

Artificial Intelligence Art: How artificial intelligence can affect the current bias within facial recognition systems

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

Jaehoon Suh Smith

Spring, 2022

Department of Computer Science

Table of Contents

Executive Summary

Lowcode: Innovative Web App Development

Artificial Intelligence Art: How artificial intelligence can affect the current bias within facial recognition systems

Prospectus

Executive Summary

Introduction

As the field of computer science progresses at its current exponential rate, it is important to understand the varying uses for the subject. Whether it be software development or implementation of Artificial Intelligence (AI) in modern society, computer science is a complicated field that can provide significant improvement to the technological world. In the case of software development, learning to produce website applications leads to the growth of future engineers. By applying software development skills, the gap between understanding technology becomes closer. Along the same thread, the implementation of AI opens another possibility of acknowledging the potential of computer science. Given the relatively early development of AI, it is vital to determine the extent of AI usage and to ensure its implementation is done properly. Computer science supports the notion of endless possibilities, and the technological society can guide its growth to become an impactful and positive study.

Capstone Project

A San Antonio, Texas-based startup that works closely with both commercial and governmental projects required implementation of new web applications and widgets for use in software development of new projects. Mendix, a leading lowcode language, tackles this web application development problem by reducing production time of traditional coding with visual aids to optimize the creation of new websites and widgets. The Mendix language allows users to provide essential websites for prominent companies along with professional skill sets in communication, technical coding, and team building. Combined with React, much of the internship consisted of providing more general developmental tools for the company while also producing customized websites for potential clients. Further development of more widgets and

websites are always possible in order to continue production of more client-based projects. With lowcode becoming a rising software development avenue, the next look may be to introduce programs like Mendix as a new leading tool to the coding community.

STS Research Paper

AI has had a significant impact on the field of facial recognition technology. With the ability to analyze and interpret large amounts of visual data quickly and accurately, AI has enabled the development of advanced facial recognition algorithms that can identify individuals with high levels of accuracy. This advancement in AI has led to the increased use of facial recognition technology in various industries such as law enforcement, employment, housing, and schools. However, the technology can be biased and may lead to misidentifications, disproportionately affecting marginalized groups of people. As a result, there have been calls for greater regulation and oversight of facial recognition technology to ensure that it is used ethically and responsibly. This call for regulation raises the notion that AI represents a Wicked Problem that cannot be identified as a good or bad tool to society. Given the recent rise of Artificial Intelligence art, how could it affect the current bias within facial recognition systems? The discussion focuses on how AI art can affect and potentially improve these facial recognition systems.

Conclusion

The application of lowcode through my experience with Mendix has vastly improved my skill sets as a young engineer. I have learned the importance of expanding my knowledge in the computer science field, which has led to my interest in researching AI. On the other hand, researching AI has broadened my future aspects in my future careers. As a rapidly developing

form of computer science, AI has piqued my interest in expanding my knowledge on the different uses of technology. Both projects have worked in tandem, where I have gained the technical experience of coding and developed a desire to broaden my understanding of the computer science field.