


Chapter 12

Performance of AI-Powered Forensic Facial Recognition: Balancing Technological Advancements With Ethical and Legal Compliance

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ABSTRACT

Facial recognition technology (FRT) is one of the transformational new tools to forensic science that greatly aid in law enforcement to identify suspects and solve the crimes. You have to be aware of this very important enhancement of facial recognition technologies. It also relates to the legality and ethical issues involved with the use of this technology in forensic settings. FRT raises significant concerns regarding privacy rights and civil liberties, and its impact on these rights is critically analysed, highlighting the importance of establishing a balance between individual freedoms and the effective use of these powerful tools by law enforcement. Connecting cutting-edge technology with proscribed legal bounds that the technology must abide by, this chapter strives to promote recognition of how forensic science can utilize facial recognition technology for the betterment of society while protecting fundamental liberties.

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1. INTRODUCTION

Facial recognition technology (FRT) has indelibly transformed since it was first developed in the 1960s, moving from rudimentary systems reliant on human assistance to advanced algorithms that can identify people in (near) real time. Early work by pioneers such as Woody Bledsoe, Helen Chan Wolf, and Charles Bisson established important groundwork for recognition automation by developing numerical descriptions of facial characteristics. These first systems involved a human manually locating facial landmarks, which computers then processed to match with images stored on file. From security to social media tagging, decades of computer hardware improvement and algorithmic design have allowed facial recognition to be deployed in myriad ways. Practicing such techniques safely requires training and community engagement at this means practitioners are encouraged to adhere to established best practices, guidelines, and evidence to ensure their responsible use. FRT is now being integrated into many different devices and systems, from smartphones to surveillance cameras, indicating the technology's widespread acceptance and usefulness to society. Facial recognition technology is an indispensable element in the forensic applications (Adjabi, et al., 2020). In domestic law enforcement, FRT is a vital tool to identify suspects and solve crimes. It allows law enforcement agencies to match and compare facial images captured from surveillance footage with databases of known offenders, speeding up the investigation process and boosting public safety. In addition, facial recognition can be used to locate missing persons, or to identify victims in the event of a disaster. FRT is a powerful tool for forensic science as its add-on ability to analyze large amounts of visual data rapidly and accurately. But the exercise of this technology also poses serious ethical and legal questions, especially as it relates to privacy rights, and the possibility of exploitation. Consequently, it is crucial to examine the ways in which progress in FRT can be harmonized with legal principles, thus ensuring responsible application whilst reaping the rewards this technology has to offer (Aherwadi, et al., 2023).

This study has several aims, including the technological advances in facial recognition technology and its ramifications for forensic science. She provides several legitimate reasons: Firstly, this paper aims to deliver a comprehensive picture of the current state of facial recognition technology, focusing on recent developments that have led to improvements in both accuracy and performance. The study proceeds to outline best practices wherein it studies the various algorithms and methods in FRT and discusses what is acceptable within forensic applications. The second aspect of the research will look at the legal frameworks which govern the use of facial recognition technology in forensic contexts. Including an analysis of existing laws and regulations that influence the use of FRT by law enforcement organizations, and debates around what reforms are necessary to protect civil liberties. In

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