SIMA

(Project Specifications Report)

1. Introduction

1.1 Description

The Secure Image Masking Algorithm (SIMA) is a software development project that aims to automatically anonymize faces in images and videos. The main goal is to protect individual privacy by altering specific facial features, such as the eyes, nose, and mouth, making the person's identity unrecognizable. SIMA will be used in various domains, including social media platforms, security and surveillance systems, and news media, to prevent unauthorized disclosure of personal information. Once completed, the service will be accessible through a web-based platform, allowing users to anonymize their images and videos with ease.

1.2 Constraints

The project faces several constraints:

- **Economic**: Developing AI models and handling large datasets for real-time processing requires investment in hardware and infrastructure.
- **Environmental**: Energy consumption from data processing should be minimized by using efficient algorithms to reduce the environmental impact.
- **Social**: While SIMA aims to protect privacy, there is a potential risk of misuse, raising societal concerns about the ethical implications of anonymization technology.
- **Political**: Different countries have varying privacy regulations, such as GDPR in Europe, that must be considered during development to ensure legal compliance.
- **Ethical**: The ethical responsibility of anonymizing individuals without their consent is significant. It is also crucial to prevent malicious uses of the technology.

- **Health and Safety**: Although there are no direct health and safety risks, SIMA plays a crucial role in securing sensitive personal data, contributing to users' psychological safety.
- **Manufacturability**: The software should be easy to deploy at scale, with seamless web integration and updates to ensure ongoing efficiency.
- **Sustainability**: The project needs to be designed for long-term use with scalable, energy-efficient models to ensure sustainability in service provision.

1.3 Professional and Ethical Issues

The development of SIMA involves significant ethical responsibility in protecting individuals' privacy. The project will adhere to professional codes of conduct, including the **ACM Code of Ethics** and the **IEEE Code of Ethics**, ensuring fairness, transparency, and reliability. Additionally, the development team must be mindful of potential biases in face detection and anonymization processes, and work to avoid them. Ensuring the software is used ethically and for the benefit of society is paramount to the project's success.

2. Requirements

- **Model Selection**: An algorithm capable of efficiently performing face anonymization will be selected, with a focus on accuracy and performance.
- **Dataset**: The model will be trained and tested on publicly available datasets such as CelebA and FaceForensics, ensuring robustness in various conditions.
- **Integration**: The software will be integrated into a user-friendly web platform (www.fimasoft.com.tr) via an API, allowing real-time image and video anonymization.
- **Testing and Optimization**: The software will undergo extensive testing in real-world scenarios and optimized for speed and accuracy to meet user expectations.

3. References

- ACM Code of Ethics and Professional Conduct
- The Software Engineering Code of Ethics, IEEE Computer Society
- IEEE Code of Ethics
- Stanford Encyclopedia of Philosophy, Computer and Information Ethics

Team Members:

- Ahmet Tunç
- İbrahim Ataberk Kabasakal
- Nusret Mert Yaşar
- Furkan Tosun

Supervisor: Ali Berkol