Title Facial Authentication System for the Web

Project Type Computer Vision, Image Processing and Security

Description - Traditional username and password focused approaches to authentication have drawbacks (such as password leaks) - Existing biometric methods have their problems when applied to a web system, due to the transparency of web systems. - Overcoming the transparency hurdle would produce a secure method of authentication for the web, using faces of users. - Using multiple methods of facial recognition, facial liveness tests, coupled with implementation details, these can be used to create a robust authentication service.

Preliminary Preparation

- Existing biometric web-based authentication methods, how do they work, what are their benefits/drawbacks?
- What spoofing methods could be undertaken, and how can we prevent these?
- What are the privacy concerns regarding a facial recognition approach, and how can these be mitigated?
- How can this be integrated into a web service?
- Use as a single sign on service (SSO). What protocols are there, how do they work, how can we integrate our system into these standards?

Minimum Objectives

- Server that recognises a user given their face (therefore carrying out authentication), generating a token for a user given their face. This token can be used for authorization.
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Intermediate Objectives

- Liveness tests - how can we ensure the user input image is of a person, and not a printout of someone's face?
- Scalable system - providing a service layer which is usable by many other users for a variety of uses, and that can scale up if required.

Advanced Objectives

- Preventing replay attacks - preventing someone from intercepting someone's facial image, and using it to gain access.

References

- Keras (https://keras.io) for Machine Learning
- OpenCV (https://opencv.org/) for image Processing
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Time Management - Project Plan Throughout the project, an agile method shall be conducted. Each sprint shall last two weeks starting on the Friday (after a supervisor meeting), with a mid-sprint meeting the following Friday. Start/end sprint meetings shall consist of what existing work has been done, along with what is needed to be focused on in the following sprint. The mid-sprint meetings are there to spot problems throughout the sprint cycle, to advise on a different approach or just for general troubleshooting. Trello shall be used to keep an Agile board of tasks that are "To Do", "In Progress", or "Done".

INSERT GANTT CHART HERE SHOWING TASKS/SPRINTS