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Final project proposal

### **Project description:**

- **Goals and objectives**

A popular component of computer vision and deep learning revolves around identifying faces for various applications from logging into phones with faces or searching through surveillance images for a particular suspect. This project aims to build a model for face detection, particularly for recognising facial attributes such as finding people with brown hair, are smiling, or wearing glasses.

- **Project requirements**

This project requires a dataset with images covering large pose variations, background clutter, diverse people, supported by a large quantity of images and rich annotations.

- **Problems to be addressed**

The model needs to be able to analyze photos and detect human faces based on various facial characters.

- **Potential pitfalls & challenges**

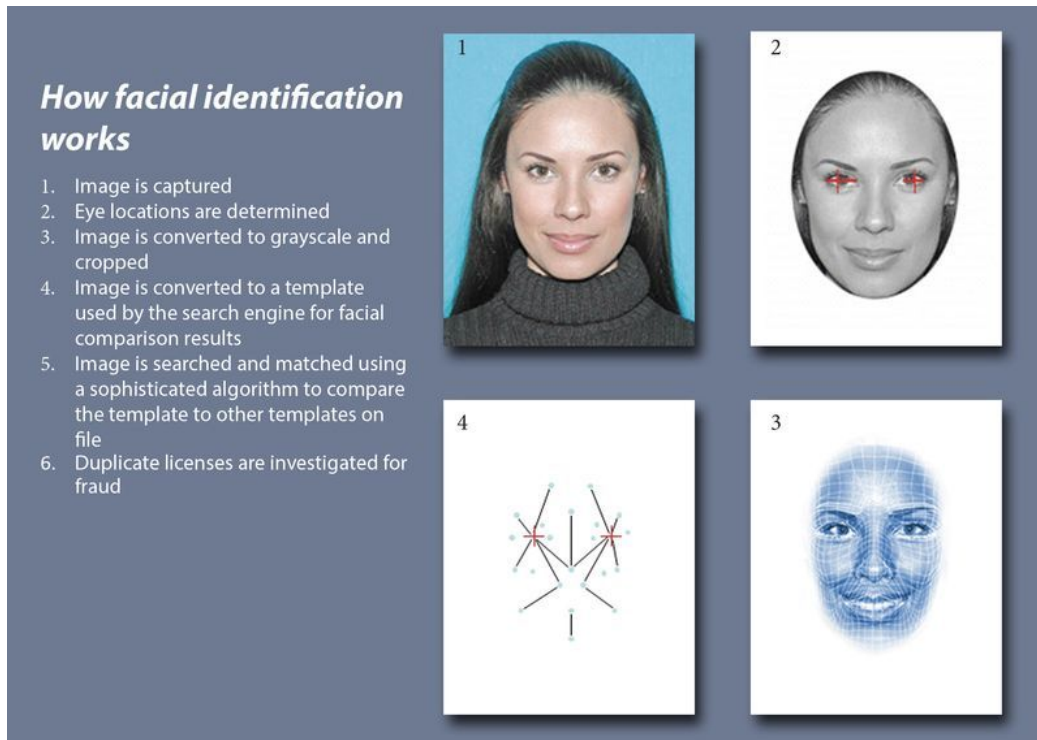
Besides of detecting faces, recognizing gender and age differences could be a challenge of this project.

### **Background Research**

- **Computer Vision**

- Computer vision is an interdisciplinary scientific field that deals with how computers can gain high-level understanding from digital images or videos. From the perspective of engineering, it seeks to understand and automate tasks that the human visual system can do.

- **Face recognition**



- **Emotion recognition**

Emotion recognition is the process of identifying human emotion. People vary widely in their accuracy at recognizing the emotions of others. Use of technology to help people with emotion recognition is a relatively nascent research area. Generally, the technology works best if it uses multiple modalities in context.

**Algorithms and code sources:**

Structure & Algorithm: Convolutional Neural Network, Deep Learning, Computer Vision, reinforcement learning

Tools: Basic python modules (Numpy, pandas, matplotlib, seaborn, etc.), tensorflow, pytorch.

**Data Source:**

<https://www.kaggle.com/jessicali9530/celeba-dataset/notebooks>

**References:**

- [1] Tutorial #1: bias and fairness in AI <https://www.borealisai.com/en/blog/tutorial1-bias-and-fairness-ai/>
- [2] Explainable AI: Interpreting, Explaining and Visualizing Deep Learning <https://books.google.com/books?id=j5yuDwAAQBAJ&lpg=PR5&ots=Iq2QOB0S6l&dq=Explainable%20AI%3A%20Interpreting%2C%20Explaining%20and%20Visualizing%20Deep%20Learning%20reference&lr&pg=PR5#v=onepage&q=Explainable%20AI:%20Interpreting,%20Explaining%20and%20Visualizing%20Deep%20Learning%20reference&f=false>