



Introduction

Abstract - Professional networking sites, such as LinkedIn have grown in popularity over the past few decades yet finding people on them still requires individuals to remember names or personal details which can easily be forgotten. Our group has developed a prototype system utilising the Azure suite that can be used to find professional profiles through an image of a face, removing the need to remember names, usernames or email addresses when expanding industry connections.

Format of the Presentation

- Motivation
- Introduction to face recognition
- Technical demonstration
- Overview of the technologies used
- Improvements
- Review of similar applications and ethics

Motivation

- Social media sites require users to remember *some* personal information
- Large business events, careers fairs, open-days
- People prefer to take pictures rather than write information down
- Facial recognition remove the need to remember names relying on the user to remember faces
- Humans are able to remember more about a face than arbitrary details [3]



Image source: Enterprise - <https://careersblog.enterprise.co.uk/how-to-make-the-most-of-a-careers-fair/>

Why does this matter?

- Social networking is a \$62.5bn industry [1]
- LinkedIn has 800 million registered users in more than 200 countries and territories [2]
- Companies and job seekers are creating a greater online presence
- Preferring the digital presence over a traditional business cards
- Increasing usability is required!

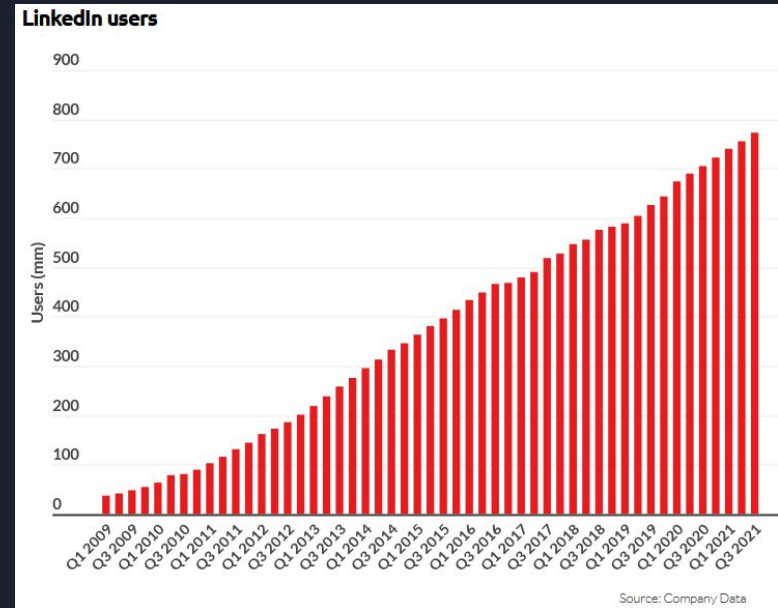


Image source: BuisnessofApps - <https://www.buisnessofapps.com/data/linkedin-statistics/>

Facial recognition

A form of biometrics that uses the features of a face to classify or identify it.

Features here refers to the shape of the face as well as details of landmarks of a face such as:

- Distance between the eyes
- Depth of the eyes
- Distance between forehead and chin
- Shape of the cheekbones
- Contour of the lips, ears and chin

The system must first detect a face

Then process these *landmarks*

Finally, the system can compare the landmark data to that of other landmark data stored in a database.

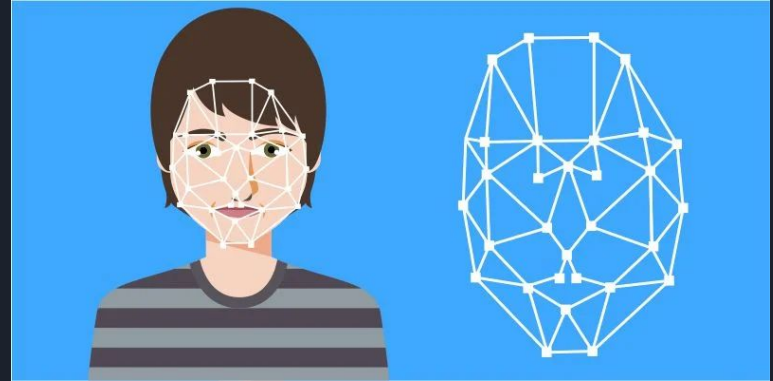


Image source: Concise Training -
<https://concisetraining.net/2018/01/facebook-adds-facial-recognition-software/>



Technical Demonstration

Overview of Technologies

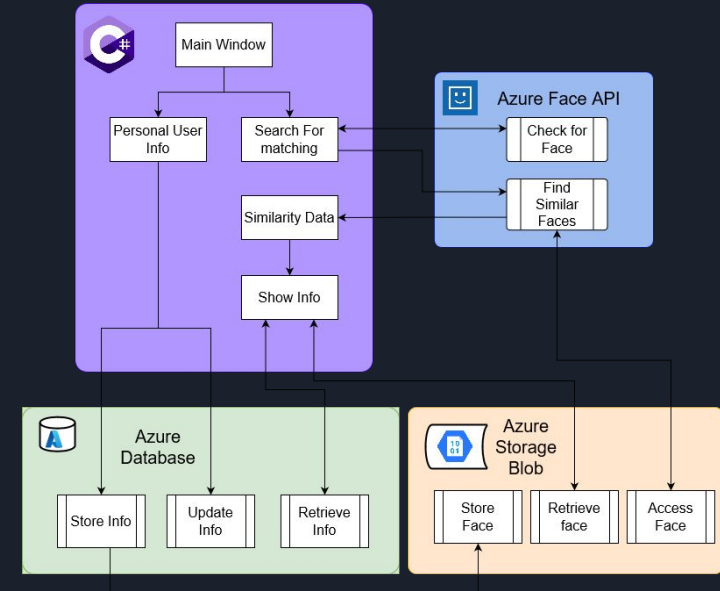
UI (C#) - Similarity to other object-oriented (OO) languages, particularly Java, and its relative ease of learning over languages like C and C++.

Azure Suite:

Face API - Robust and well defined provides sufficient accuracy.

Storage Blob - Stores the images of faces.

SQL Database - Stores user info.





Identified points for improvement

Azure suite is paid and contributed to most of the limiting factors to reduce overall cost of the system.

Limited Service Call Requests

Slows down operation to 20 API calls per minute

Is slowed by the size of the imagebase (and database) although this version caches downloaded data .

Connectivity

Requires a constant internet connection to use any functionality.

Cross Platform

Current approach is only viable for use on Windows due to the forms framework



Similar reading

Research into Face Recognition software “Face++, IBM Bluemix, AWS Rekognition & Azure Face API” found [4]:

- All systems perform well for recognising faces and gender but;
- Varying results with age, and race potentially due to skewed training data?

Khan *et al.* [5] explore a live system, constantly taking in data and checking for students attendance. Using YOLO V3 [6] and Face API (Azure):

- High accuracy results
- Promising for a live feed approach

Ethics of Facial Recognition [7]:

- Consider regulations, and rights of people
- Design with ethics in mind
- Robust and safe AI that protects information



Concluding Remarks



References

- [1] <https://www.ibisworld.com/industry-statistics/market-size/social-networking-sites-united-states/>
- [2] <https://about.linkedin.com/>
- [3] <https://www.scienceabc.com/eyeopeners/how-many-faces-can-we-remember.html>
- [4] S.-G. Jung, J. An, H. Kwak, J. O. Salminen, and B. J. Jansen, “Assessing the accuracy of four popular face recognition tools for inferring gender, age, and race,” in ICWSM, 2018.
- [5] S. Khan, A. Akram, and N. Usman, “Real time automatic attendance system for face recognition using face api and opencv,” Wireless Pers Commun, vol. 113, pp. 469–480, 2020.
- [6] J. Redmon and A. Farhadi, “Yolov3: An incremental improvement,” 2018.
- [7] . Zeng, E. Lu, Y. Sun, and R. Tian, “Responsible facial recognition and beyond,” 2019.