Facial Recognition Software

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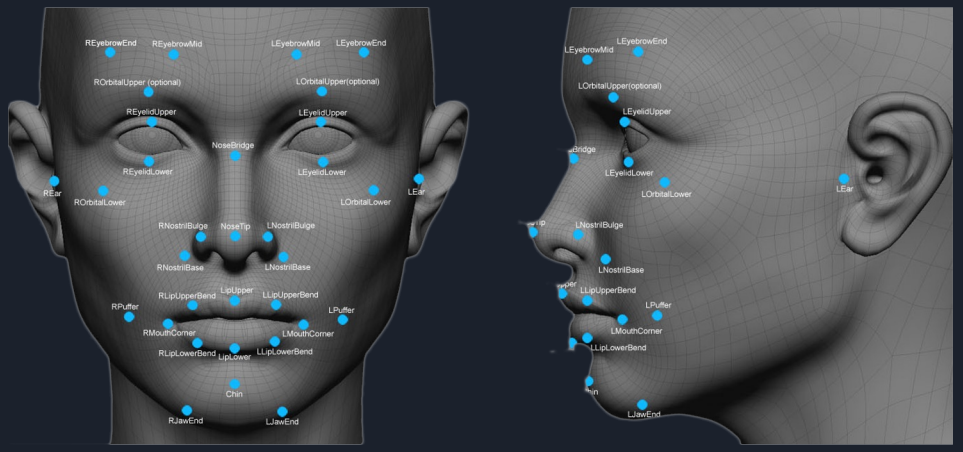
Background

- Software that identifies people based on their facial features
  - Identifies “facial landmarks” to distinguish different faces
  - Compares facial landmark data to a database to match the face
- Uses machine learning



History of Facial Recognition

- 1960's
  - Woody Bledsoe, Helen Chan Wolf and Charles Bisson started to use computers for an early version of facial recognition
  - Used manual methods to find distances between facial features, then the measurements were uploaded to the computer.
- 1970's
  - Added 21 markers to improve the accuracy of facial recognition
  - Still used manual processes for labeling facial features
- 1980-90's
  - Linear Algebra was used to improve the accuracy of facial recognition
  - Able to detect faces in images, creating automatic facial recognition

History of Facial Recognition

- 1990-2000's
  - Defence Advanced Research Projects Agency (DARPA) and the National Institute of Standards and Technology (NIST) rolled out the Face Recognition Technology (FERET) programme to encourage the commercial facial recognition market.
  - Created a test set of 2,413 images representing 856 people
  - The NIST developed Face Recognition Vendor Tests (FRVT) to help evaluate commercial facial recognition software
  - Face Recognition Grand Challenge(FRGC) used to develop the latest facial recognition algorithms
  - Social Media started to use facial recognition

Facial recognition software today

- Widely used and becoming accessible
  - Apple’s FaceID
- Clearview AI
  - Approved for a federal patent
  - Scrapes public images on social media to find matches

Use Case: COVID-19 Tracking

- Bucheon, South Korea
- Recording people who passing CCTV
  - Track movement of infected
  - People who do not wear mask
- Privacy Problem
  - Monitoring citizens

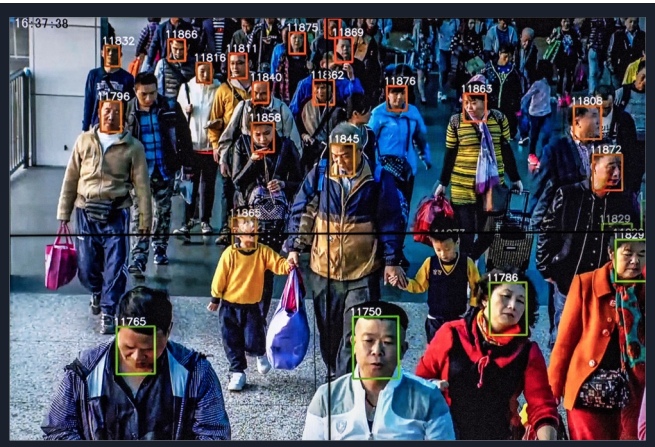
Use case: Preventing retail crime

- Used to identify known shoplifters
- Photographs of individuals can be matched against large databases of criminals
  - Loss prevention and security professionals can be instantly notified when a shopper enters a store that prevents a threat

Dangers of Facial Recognition

- Police Use of Facial Recognition
  - Can lead to incorrect identification and arrests
  - Studies have shown that facial recognition technologies perpetuate racial discrimination
  - Public has to relinquish any sense of privacy leading to potential abuses

Dangers of Facial Recognition



- Social control
  - Mass surveillance of the public to identify those who act against the government's wishes
  - Collecting data on individuals to sell for advertising or other purposes

Future of Facial Recognition

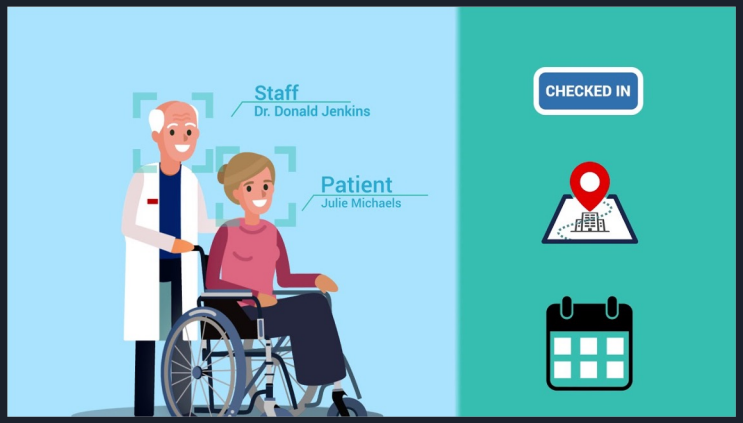
- Juniper Research shows that facial recognition hardware grows by 50% each year.
- Facial recognition solutions are expected to be present in 1.3 billion mobile devices by 2024
- COVID-19 has been one of the greatest accelerators of facial recognition technology

Automobile Industry

- $6 Billion lost in the US to automobile theft.
- Permissions and restrictions for family members
- Unauthorized usage will block the car from starting
- Iris recognition Driver State Warning System to keep drivers focused on the road

Healthcare

- Improvements to overall safety standards
- Reduction in identification errors
- Patient monitoring and diagnosis



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