



# CAMERA TRACKING COFFEE SHOP

F6886 - FPT UNIVERSITY

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# 01 - OUR TEAM



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# 02 - INTRODUCTION



## INPUT

Using camera to capture information of people, check time people arrive and leaving, save table location and check the time people spend at table.



## OUTPUT

**+Information** => Identify employees to check attendance and tracking, capture characteristics about customers for predict potential customers.

**+Time arrive and leaving** => Manage employees doing job, save total timespent of customers per group of characteristics for analys and predict.

**+Timespent interact with objects** => Manage employees doing job, calculate customer interest in an item/table.



# 03 - APPLICATIONS



# SERVICE FIELD

# 03 - APPLICATIONS

## -Providing:

- Collect customer statistics (such as age, gender)
- Tracking customer's activities (timespent)
- Tracking employee's activities (identity, timespent)

## -Application:

1. Counting customers, employees
2. Predict potential customers and number of customers in a time
3. Tracking customer's interest (most viewed product, time-spent at a table)
4. Tracking employee's works (time arrival, identity, leaving)



## MALL

### Buying product:

- Supermarkets
- Convenience stores
- Clothing shop
- Pet shop
- etc..



## COFFEE SHOP

### Spend time to use

- Restaurant
- Internet shop
- Bookstore



## SHOWROOM

### Spend time to look/consider

- Furniture showroom
- Car showroom
- Fashion showroom



## EVENT

### Statistics of participants

- Fashion show
- Anime festival
- Music show

# PRODUCTION FIELD AND OTHERS

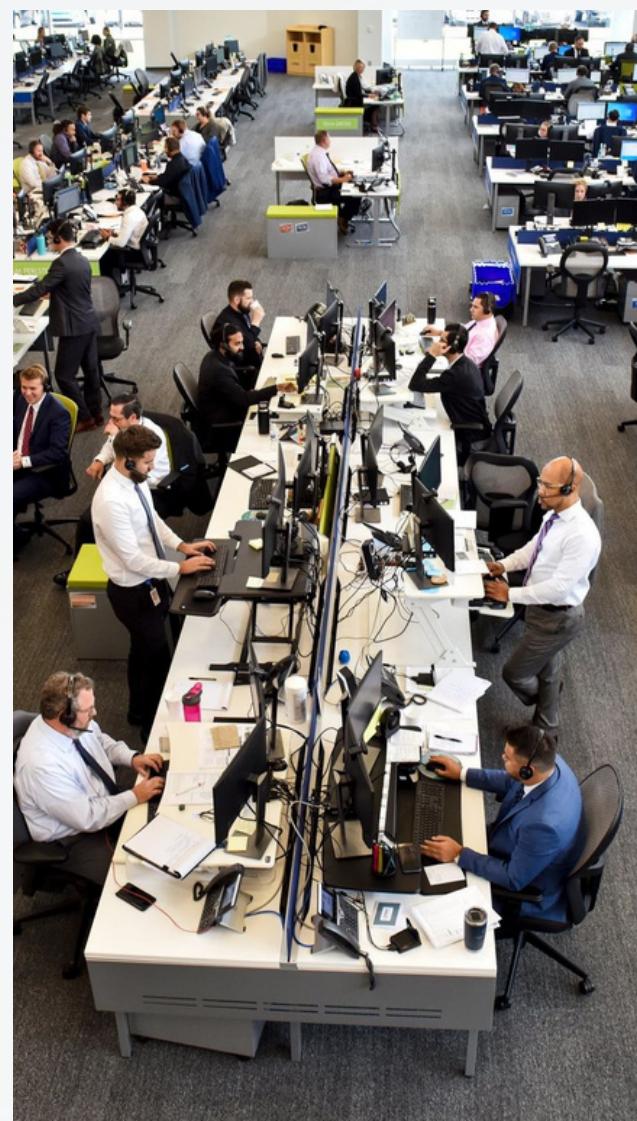
## -Providing:

- Collect employee statistics (such as age, gender, identity)
- Tracking employee's activities (timespent)

## -Application:

1. Counting number of employees
2. Check attendance of employees
3. Tracking employee doing work(Timespent doing jobs, leaving, comeback time)

# 03 - APPLICATIONS



## COMPANY OFFICE

### Identify Employees

- Office
- Police Station
- Fire Department
- Nursing Home
- Animal Care Station
- Laboratory

## FACTORY

### Employees doing job

- Fish factory
- Depot

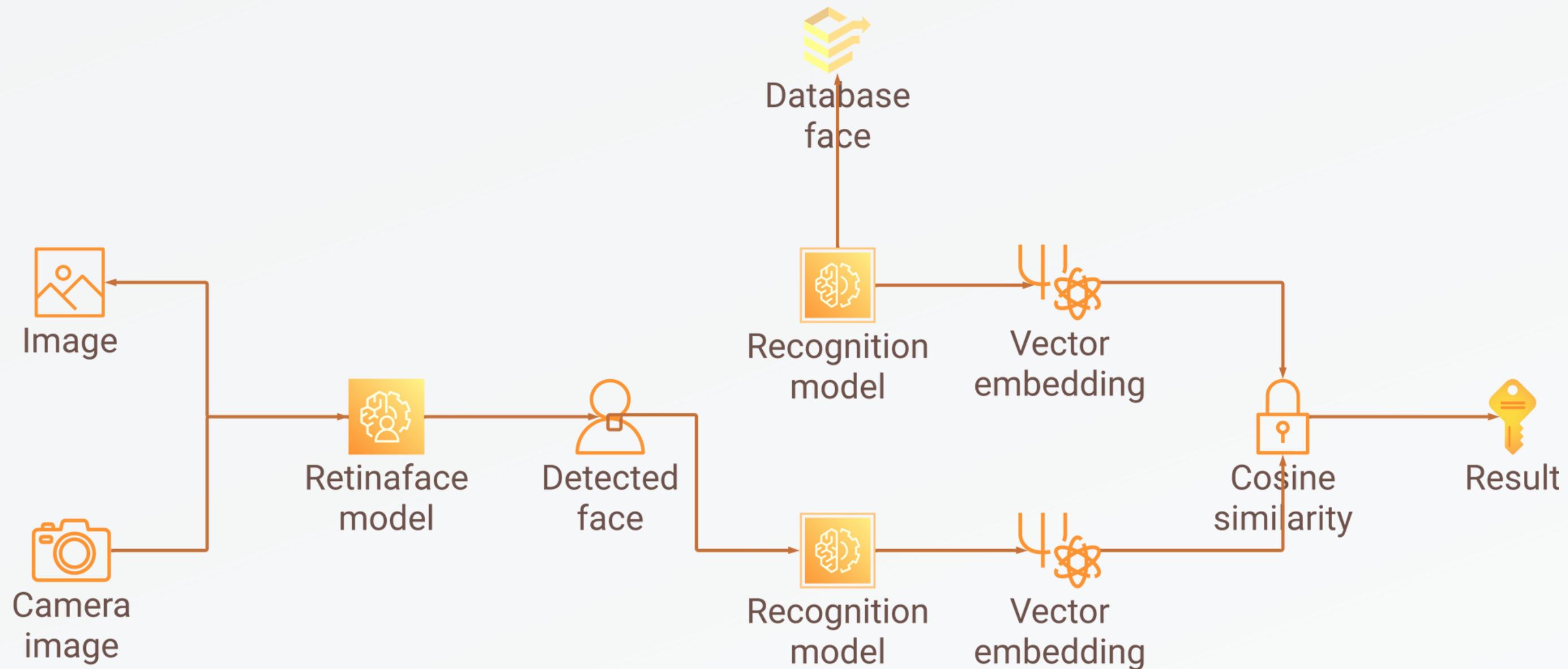


## SCHOOL

### Identify Student Spend time on areas

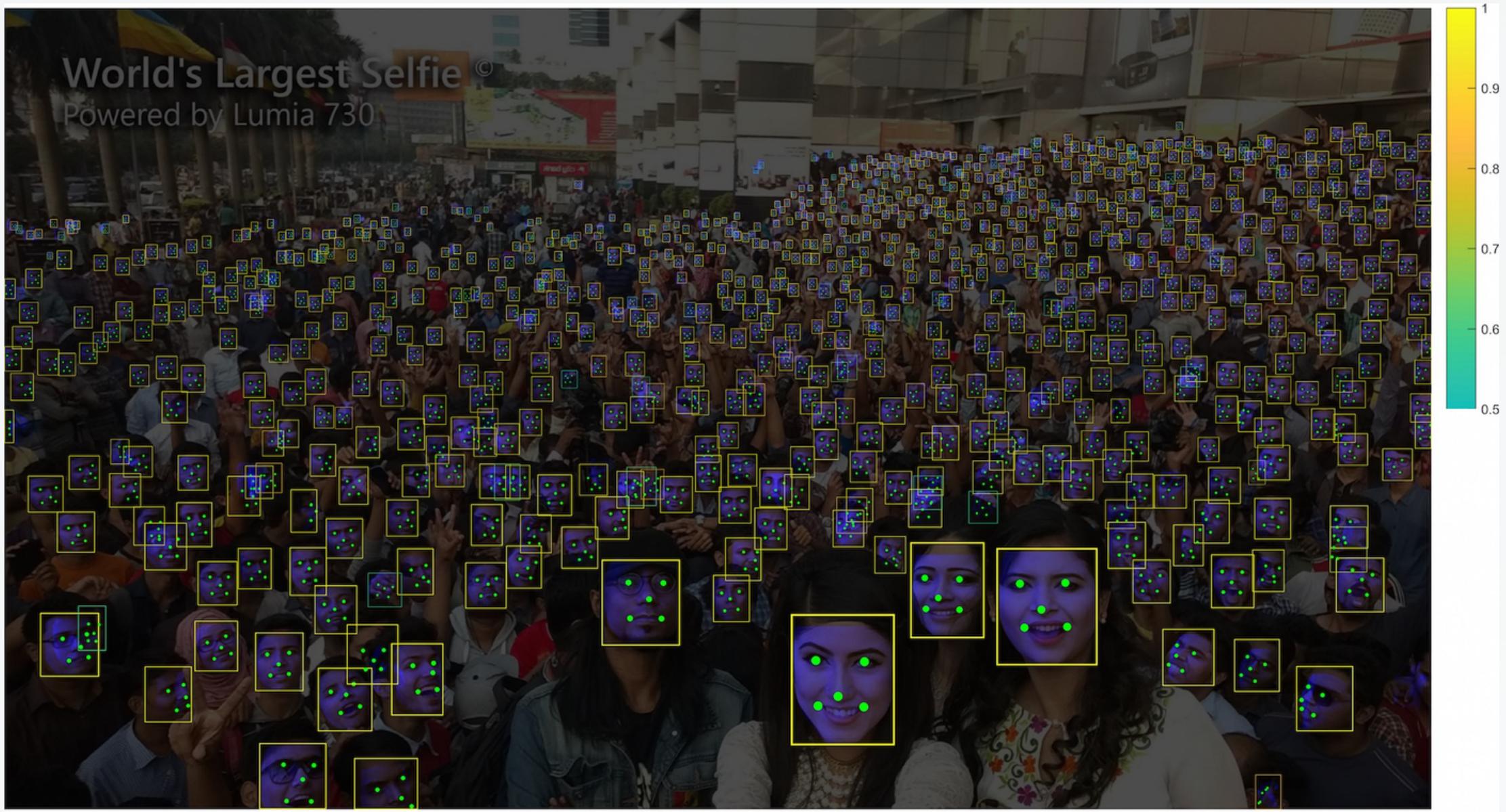
- Nursery school
- High school
- University

# 04 - FEASIBILITY



An artificial intelligence-powered facial recognition system is central to our advanced coffee shop tracking camera. This sophisticated mechanism primarily hinges on a face detection model, skillfully identifying faces for recognition against those cataloged in our database.

# 04 - FEASIBILITY OF FACE DETECTION MODEL



In the realm of face detection, several models have gained prominence due to their accuracy and efficiency. Among them are the likes of YOLO (You Only Look Once), SSD (Single Shot MultiBox Detector), and Faster R-CNN (Region-based Convolutional Neural Networks). However, our proprietary model, RetinaFace, stands out. Not only does it excel in real-time precision across multiple faces, but being a self-coded model, it offers unparalleled flexibility. This allows us to effortlessly fine-tune and customize the model as per client specifications, providing an optimized solution for each application.

# 04 - FEASIBILITY OF FACE RECOGNITION MODEL

**Same person**



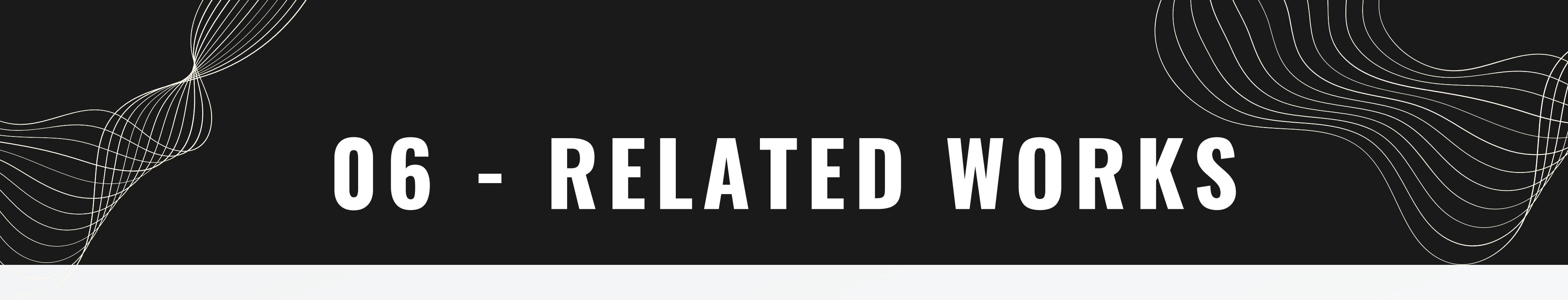
**Different people**



In our pursuit of excellence in facial recognition, we have adopted the R100 ArcFace model. Recognized for its outstanding performance in various benchmarks, the R100 variant of ArcFace delivers state-of-the-art accuracy in identifying distinct facial features. This choice reflects our commitment to providing top-notch solutions, ensuring precision and reliability for our users.

# 05 - DEMO

In our demonstration video, you will get a clearer insight into the capabilities of our specialized camera tracking system for coffee shops. This system goes beyond mere tracking; it identifies staff members within the cafe based on their facial features. Specifically, our developed application, FPTcoffee, illustrates precisely how this system operates. It recognizes faces by comparing them to pre-saved photos in the "aligned" directory. For those keen on the technical details, the source code for this application is openly shared on our GitHub repository. To explore further and experience this innovation, visit: <https://github.com/Zeres-Engel/FPT-AI-challenge>. We hope you enjoy it!



# 06 - RELATED WORKS

- Facebook's DeepFace: Facebook introduced DeepFace, a system that can identify human faces with an accuracy of 97.25%. The system uses a 9-layer deep neural network to convert 2D images into a consistent 3D shape, allowing more accurate face recognition even if the initial image is partially obscured or taken from a different angle.
- Apple's Face ID: A hallmark feature of newer iPhones and iPads, Apple's Face ID uses a combination of infrared emitters and sensors to create a detailed depth map of the face. This allows it to provide secure authentication and unlock devices, even in varied lighting conditions.
- Amazon Rekognition: Amazon's cloud-based AI offers a variety of image and video analysis tools, with face recognition being a significant feature. It can identify faces in images and videos, and also detect attributes such as age range, emotions, and facial hair.

# 07 - FUTURE DEVELOPMENT

## Tracking Employee update

**Count the amount of work  
an employee can do**

- Count the number of cups a waiter serves
- Count the number of objects a worker makes in a sector at factory



## Shoplifting detection

**Tracking important objects  
to detect shoplifting**

- Jewelry in the store
- Display items in museums, showroom, events.
- Computer, laptop, phone



## Behaviour warning

**Detect improper behavior**

- Fighting
- Pervert, molest
- Robbery
- Stroke, Faint, Sick



**THANK'S FOR  
WATCHING**

