CymbIoT

Making IoT Smarter

Autonomous Face Recognition

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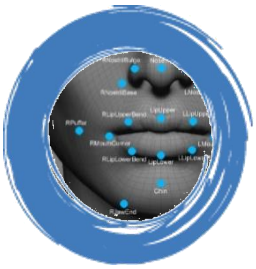
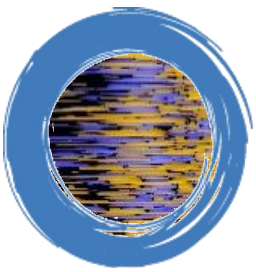
SECURITY| URBAN SOLUTIONS| RETAIL



In recent years, face recognition technology has emerged as a powerful tool for law enforcement and on-site security systems. The promising potential of the technology has attracted attention from other industries outside of security: for example, augmenting the ability to compile consumer data and enhance customer service is one key retail business use case.

A primary problem with existing state-of-the-art face recognition is the inability to identify multiple persons in a given frame from a stored database of faces. In a world in which cameras are ubiquitous and digital data continues to grow exponentially, it is a challenge to accurately analyze images in real-time.

CymbIoT's IOT platform has the first AI solution capable of human-level image understanding, backed by more than 200 patents and providing the leading solution in computer vision technologies: Autonomous Facial Recognition.



TECHNOLOGY

Multiple Face Detection and Recognition

CymbIoT's technology offers real time face detection and recognition for live video stream at high frames per second rates, handling simultaneous detection and monitoring with ease.

Unsupervised Learning

The system has the ability to use existing footage to automatically cluster faces, and create a database in an unsupervised manner - without requiring a clean training set for each individual person.

Dynamic & Online Learning

The system is able to learn new faces online while clustering and building upon existing profiles to enhance future recognition, requiring only a single reference image to generate a tag ID

Large Scale Database

The CymbIoT engine provides extremely fast lookup to support recognition of several billions of faces efficiently.

Auto Profile Generation

The Engine automatically detects new individuals that are not registered in the system and builds a unique profile for each person.

Multiple Camera Support

The autonomous facial recognition technology is capable of supporting many cameras in real-time.

All Conditions

The system is fast and accurate under problematic conditions including poor lighting, occlusions, low quality images, and infrared light.

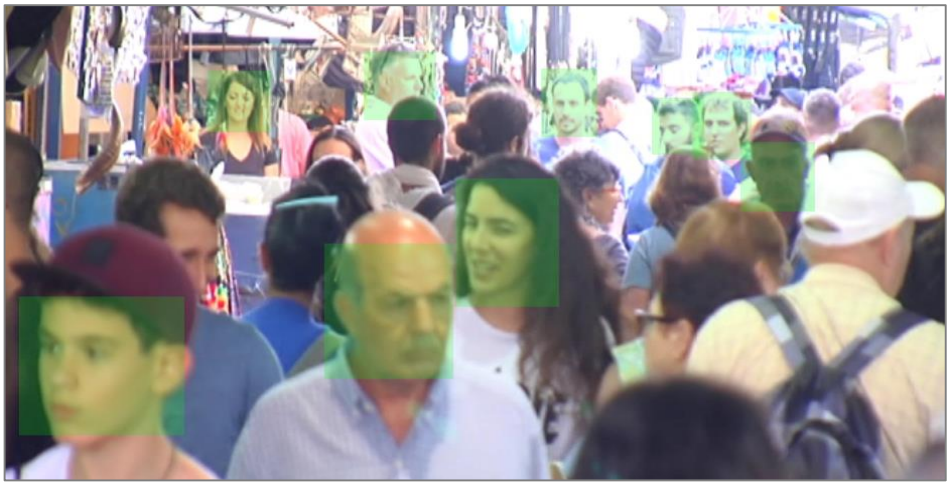
Journey Tracking

The AI is able to identify and track individuals as they move through space.

FACE RECOGNITION/ FACE IDENTIFICATION

Face Detection

Face detection is used to determine the existence, location and size of a human face within a particular image or video frame. The AI is robust enough to detect facial features at high accuracy, even when partially occluded or not looking straight into the camera.



Typical Face Detection Output

Face Recognition

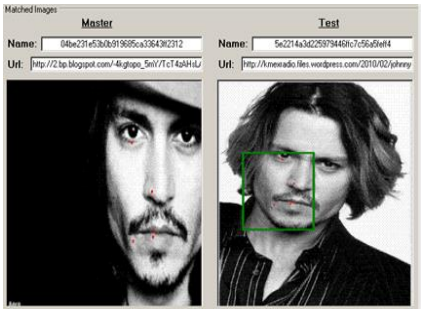
Current state-of-the-art face recognition technologies are based upon facial landmarks or feature extraction (position, size, shape of the eyes, nose, cheekbones, etc.). CymbIoT's unique approach is based on dynamic signatures that automatically find the unique patterns for each face, allowing for nearly zero false positives and extreme scalability.

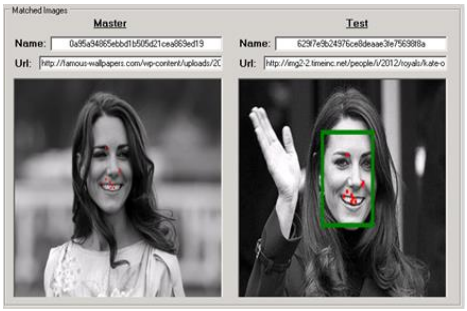
CymbIoT's real-time facial recognition operates within a video surveillance camera. The green overlay shows face detection; the blue overlay signifies face recognition of persons in the target DB.

FACE RECOGNITION/ FACE IDENTIFICATION

The CymbIoT Signature

The ‘Master’ section of the examples below represents the highly compressed lossless signatures which enable recognition. The ‘Test’ portion shows recognition capabilities across a variety of examples.





Recognition Quality

The CymbIoT engine is designed to recognize faces across a variety of conditions including low light and low resolution. Additionally, the system is not confounded by wearables (hats, glasses) and differing appearances (beards, haircut, and more).

Precision and detection depend upon parameters such as video quality, images in database, or location of the camera, adapting to each setup.

In most cases, the precision is above 99.5%, and detection is above 95%.

System Requirements

Face Service: Running on premise, Supports multiple cameras, Simple installation and setup.

The system is robust and simple to manipulate. It is designed to quickly adapt to specific customer needs. It is supplied as an SDK with all the relevant functions to: Detect faces, Recognize faces, Manage target DB

Stream Resolution Requirements: 30px between eyes or at least 100px for a face (the higher resolution the better)

Acceptance angle for recognition: up to 30 degrees (between line from camera to face and line pointing from face out).

Security

Event

Group of people enter secured area.

Detection

Face Recognition identifies group.

Response

CymbIoT C&C analyzes data and implements procedures:.

Checks group access control permissions

Identifies visitors based on images in DB

Opens gate to visitors with permission, alerts for others.

Crowd Management

Event

Exhibition room in gallery is overfull.

Detection

Visual Analytics Counter notes crowd density.

Response

CymbIoT C&C analyzes data and implements procedures:

Sends Smart-sign messages to direct people to other rooms.

Alerts security

Switches doors to Exit Only – people can exit room but not enter it.

Retail

Event

Customer approaches store parking lot.

Detection

Visual analytics identify returning customer.

Response

CymbIoT C&C analyzes data and implements procedures:.

Opens parking gate & directs customer to free parking via Smart Sign

In store - sends Smart sign message with relevant ads based on history.

Customer is sent SMS with relevant coupon based on history.

CymbIoT’s mission is to design, implement and deliver advanced Internet of Things (IoT), Video Management Solution (VMS), and Command & Control (C&C) platforms. We empower end users to configure and manage integrated networks of all types and scales - from Smart and Safe Cities, through Transportation Hub security, to Smart Buildings and Enterprise management.

With millions of sensors across numerous verticals using our products to deliver actionable intelligence and real-time response capabilities to customers worldwide - we have the experience, know-how and technology to deliver real world solutions that work.

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