# MAI On-Camera Face Cropper ACAP - ARPTEC-7

## Face Cropper ACAP with built-in head pose and image quality.

Access points are dedicated to security and smooth user access. With the incoming integration of Facial Recognition, these access points require qualitative face detection to not only know if there is a person but track this head position as the person stands or walks by.

Knowing the user head pose offers a tremendous advantage to reduce system cost.

## System cost reduction

Traditional face cropper run on the server and require full stream of several cameras into the main server and the recording of every frame before processing every frame for facial recognition.
This is costly in bandwidth, hard-drive capacity, and electricity.

## MAI ACAP Face Cropper :

- ✓ Send face crop to the server: 20x lighter files
- ✓ Send only the best crop based on head pose and image quality: 15x less files
- ✓ Improve the Face Recognition quality by processing qualitative frames only
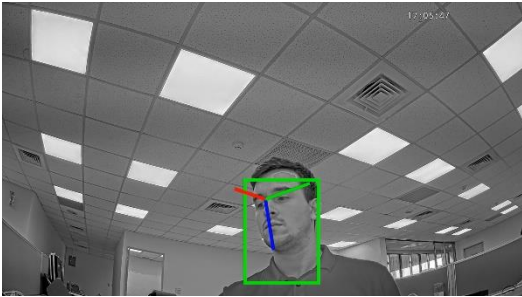- ✓ Improve the Face Recognition speed by processing only a few selected frames

The combined benefit from MAI ACAP Face Cropper allows for:

## 40-50% reduction in system cost

Agnostic to RGB or IR, MAI functions are running on Axis ARPTEC-7.
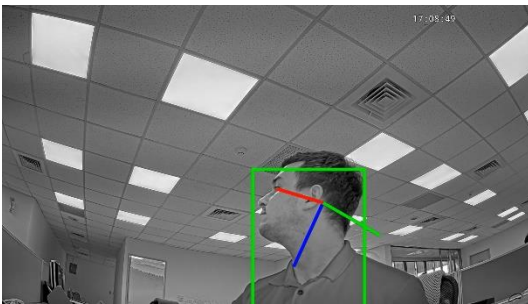
Trained and tested over millions of images.
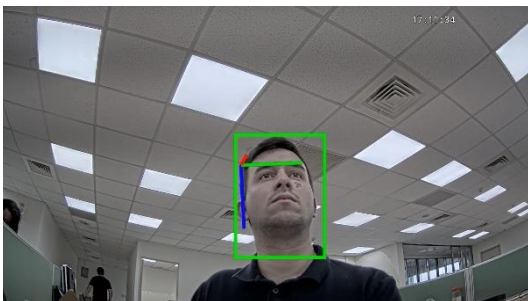
# Functions set

## Face detection



| Functions features | Limitation |
|---|---|
| Detects user face | Up to 3 meters from the camera<br>User walks slow or stands |

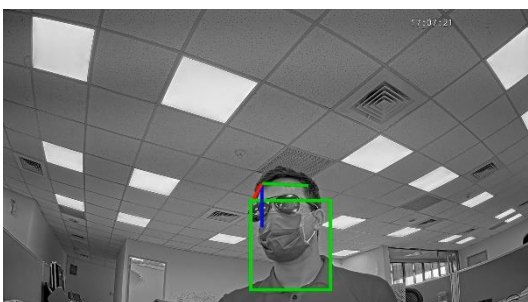## Head pose classification



| Functions features | Limitation |
|---|---|
| Output a 3D position of the user head | Up to 2 meters from the camera<br>User walks slow or stands<br>User face is <50% covered |

## Image quality scoring



| Functions features | Limitation |
|---|---|
| Output image score for each crop | Up to 3 meters |

## Image selector and cropping



| Functions features | Limitation |
|---|---|
| Select and crop face depending on preset configuration | May depends on use case (e.g user walking speed may need to be constrain, face occlusion) |

**Notice:**

- Supported face occlusion: up to 50% (mask or hands occlusion)
- Can be complemented by additional filtering algorithms on server
- Support mask, mask + sunglasses, hat, beard, and large head-pose

# Installation guide – Camera set up

MAI ACAP Face Cropper is positioned near the entrance to avoid any intent misunderstanding by corridor by passer. The Axis Camera can be installed at eye level of average height persons and use standard configuration, for special positions and distances, contact MAI Support.

The below image is a suggested position where the user is requested to look at the camera to show his or her intent to pass the connected gate.
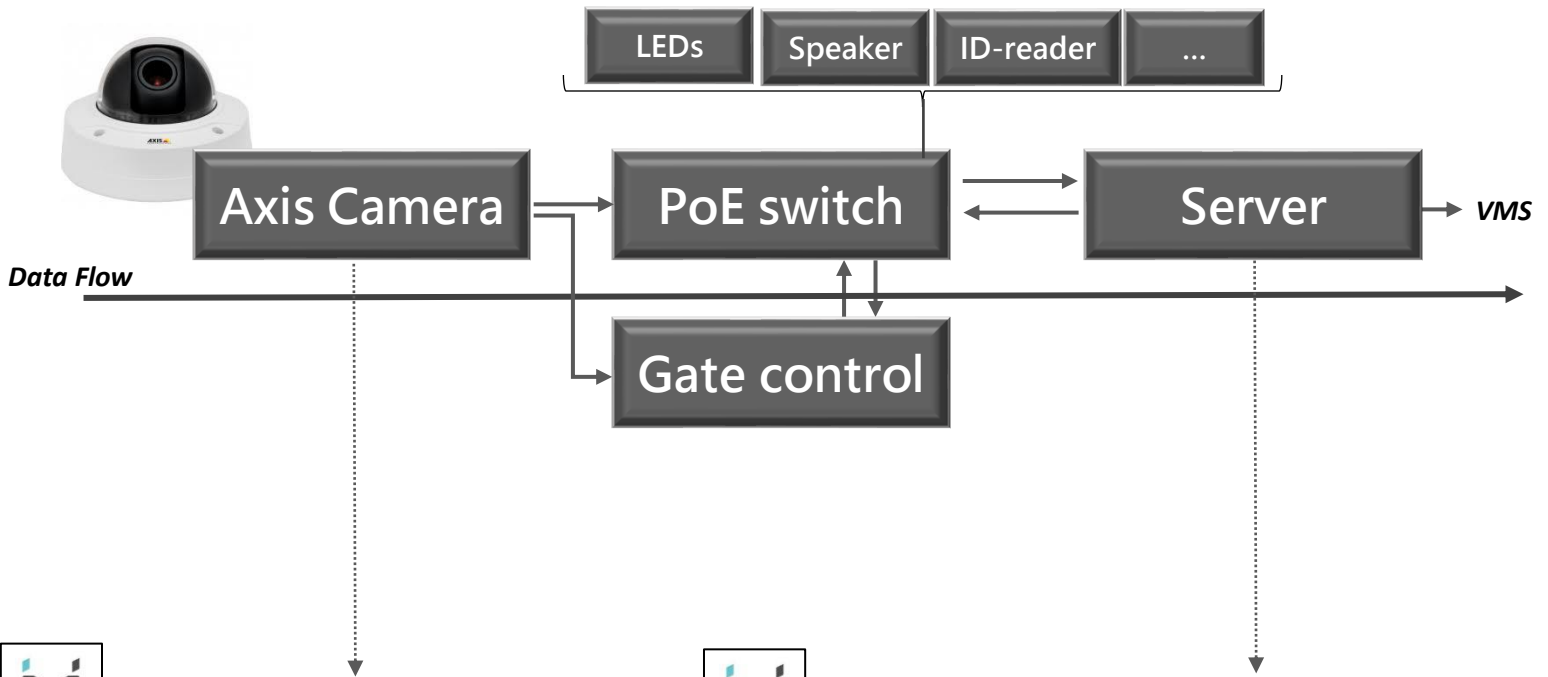
## Configuration:

Position:

- Face the user when user face the door (driver face fully visible)
- If not possible, request the user to face the camera when passing by.
- Height 170cm // Distance with user <3 meters

Configuration

- InfraRed mode offers better performance

# Driver Safety and Security solution

## Two offer levels from pure edge to cloud.

| LEDs | Speaker | ID-reader | ... |

**Axis Camera** → **PoE switch** ⇄ **Server** → *VMS*

*Data Flow*

**Gate control**

### MAI DMS ACAP

**On-camera Face Crop:**

- Send best crop at 150x150 px or less
- Cropping rules can be set depending on the use case

**Extensions:**

- Send wrong head-pose signal to speaker
- Send occlusion alert if user wear mask
- Send camera occlusion alert if the camera is blocked by an object

### MAI Facial Recognition

**Functions:**

- Call the best crop and discard occluded faces
- Compare with data base
- Output highest matching face
- If ID is claimed: matches to ID
- If not on the database, output signal to surveillance staff

**Advantages:**

- Very lightweight = no big server needed to run it
- Can reach remarkably high inference speed depending on hardware
- Logic already compatible with MAI Face detection
- Smart features filter out low quality crop to limit false negative and improve the user experience
- Scoring and error messages allow for better real-time user feedback such as "too far", "too close", "not straight"

# About MAI

MAI is an AI-Application design house with a full-stack service team involved in supporting system integrator partner and hardware partner such as Axis Communication.

MAI owns the best embedded inference framework in the world which enables numerous lightweight applications to run on Axis ARPTEC-7 based cameras at high fps with high accuracy.

MAI works at all level with end-users, system integrators as well as Axis R&D and sales team.

<u>The below solutions are provided for Axis Camera users:</u>

## Off the shelf ACAP

### DMS ACAP

Driver monitoring solution for fleet and office-based operator (bus, train, operators)

### Face Cropper ACAP

Smart face detector for lower system cost and better facial recognition.

## Custom-made ACAP

### PPE Detection

Detect helmet, safety belt, safety shoes, harness or any other safety gear mandated to enter the site.

### Vehicle Detection

Detect vehicles to crop vehicles only, reduce bandwidth and store only useful information.

## The below solution can be provided on server:

### Face Recognition

Lightweight Face Recognition for <1000 user faces project. Enable the use of low cost server.

Available support : Taipei / Austin / Shanghai

Contact：info@mindtronicai.com // raphael.verove@mindtronicai.com