

# Theme : Artificial Intelligence

## Subject : Robust Face Recognition Algorithm in Surveillance

### Introduction

Face recognition is a computer vision technology to automatically identifying or recognizing a face from images and video sources. Recently, face recognition system has been playing an important role on security domains, especially for using many CCTV cameras installed over an entire city. However, even a high-qualified face recognition system does not show promising performance under surveillance situation, e.g., a CCTV camera with more than 5meters in height, 10meters in distance.

Hence, the goal of this project is to develop a robust face recognition algorithm having good performance on surveillance environments and being capable of be deployed to system with face database. For this, novel dedicated-surveillance face detection and identification technology are essential, and well-studied facial features extraction could be crucial to matching a face over hundreds of thousands of faces

### Scope

- With a conventional surveillance camera, face detection technology to allow severe environments, such as crowded, long-distance, occluded, and so on
- Face identification technology with high accuracy (better than the state of the arts)
- Various facial features to be widely used in face recognition (e.g., matching over whitelisted face DB)

### Research questions

We are interested in the following research questions, which are mostly related to possible situations experienced very frequently in urban surveillance.

- How to recognize the face in the following case of face rotation, such as roll (+/- 50degrees), yaw (+/- 50degrees), and pitch (+/- 30degrees)?
- How to identify the face in long-distance, where the face has only 20x20 pixels?
- How to overcome obstacles caused by shadow, illumination, and whether variation?
- Can the final recognition proceed with only facial features extracted to properly express the face traits (Afterward, someone is capable to find a person when using them)

### Expected Deliverables

The following is open to discussion:

- Prototype face recognition system using face photos taken in surveillance environment
- Algorithm and source code
- Patents with Samsung SDS (if agreed)