Research topics	Video Processing for Body Camera
Position (M/F)	Post-Doctoral
Reference offer	SN/JLD/bodycam/PostDoc/022023
Research Department	Digital Security
Publication date	15/02/2023
Start date	ASAP
Duration	18-months CDD (temporary work contract)

Description

This work is done in collaboration with UPNM (National Defence University of Malaysia).

Body worn cameras (BWCs) have been more popular over the last decade. They are becoming one of the essential tools for law enforcement officers to carry with them for surveillance purposes. The implementation of BWCs can be seen across Europe and the rest of the world.

There are several types of BWCs utilized by law enforcement across the world. Some are attached to the officer's helmet, while others are linked to the officer's chest. Some record continuously, while others begin recording only when a certain trigger occurs, such as the opening of a car door or the activation of a siren. Generally, videos captured by BWCs are used a posteriori in case of major problems between police officers and citizens controlled (reactive surveillance). The main goal of this work is to develop video processing tools enabling proactive surveillance. Very limited studies exist in the domain. Because of the specificities of the BWCs, customized algorithms have to be designed and developed. Below the list of key elements and challenges to investigate:

- Cameras: They are different models with different capacities in terms of resolution, field of view, storage, wifi, infrared, etc. Existing technologies will be listed at the beginning of the project;
- Datasets: The number of existing datasets is very limited. If needed, a new dataset would be created;
- Quality evaluation of recoded videos in real time: it is important to be sure that recoding videos will be usable by humans and machines thank to an appropriate positioning (e.g. enabling face detection of person controlled) of the camera and appropriate set of acquisition parameters.
- Face recognition in adverse conditions: contrary to many other contexts (e.g. face recognition at borders), face images could be of low quality in terms of pose and illumination that could impose to revisit some existing algorithms in face recognition;
- Facial expression, micro expressions and emotion: extracting such information can provide cues to policemen concerning intention of the person controlled and his/her psychological status:
- Gait: It is also possible to extract information about the identity or behavior of a person by analyzing his/her gait. Existing studies have to be revisited to be adapted for BWCs.
- Finally, it can be envisaged to identify the camera's wearer from recorded videos.

Requirements

- Education Level / Degree: Phd
- Field / specialty: Image processing / Computer Vision

Application

The application must include:

- Detailed curriculum,
- Name and address of 2 references.

Applications should be submitted by e-mail to secretariat@eurecom.fr with the reference: SN/JLD/bodycam/PostDoc/022023

About EURECOM

EURECOM is a major Engineering School and a Research Center in digital sciences founded in 1991 as a consortium in the international technology park of Sophia Antipolis. The IMT is a founding member of the GIE. Teaching and research activities are organized around 3 promising fields: digital security, communication systems and Data Science.

EURECOM has a staff of 150 (researchers and support teams) and welcomes 400 international students on the Campus Sophia Tech, the largest information science and technology campus of the region. EURECOM enjoys a privileged geographical environment on the French Riviera (Côte d'Azur), between sea and mountains, at the heart of a dynamic and multidisciplinary ecosystem that promotes high-level scientific and technological innovation.

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- Attractive salary
- Employee profit sharing policy
- Company health cover (mutuellel) with high levels of guarantees for the whole family (employer participation of 60%)
- Restaurant vouchers (60% employer contribution)

EURECOM has a dynamic policy in terms of inclusion and quality of life at work, committed to diversity and gives the same consideration to all applications, without discrimination.

EURECOM has a “Mission Handicap” policy. All our positions are open to people with disabilities. A designated disability referent welcomes and provide support to employees and students suffering from a disability. He puts in place the necessary arrangements and makes positive commitments in favour of a personalized integration.

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