Human Recognition in Surveillance Settings – Database I

Project Proposal

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1 Objetives

Recognizing humans in surveillance settings is among the major challenges in artificial intelligence, due to the wide range of potential applications (e.g., security, safety and forensics). By assuming that subjects are not aware of the data acquisition process, it is expected that the collected data has very poor quality, not only in terms of resolution and lighting, but also in terms of pose and occlusions.

Figure 1: Typical conditions in surveillance settings, where recognition faces severe problems due to poor data quality (source: http://verdict.co.uk).

Hence, there are numerous efforts being developed to develop automata able to recognize human beings in such type of conditions, i.e., using extremely poor-quality data. Among the many difficulties that arise in this setting, one of the problems is the

inexistence of solid information about the actual variations in the data collected with respect to each data covariate (e.g., distance, pose, resolution, and lighting).

This project aims at collecting a dataset of synchronized data, simoultaneously collected under controlled and uncontrolled settings. The idea is to obtain a function that is able to match data between both domains, which will be of obvious interests for further recognition proceses. By using such function, it will be possible to obtain a poor quality image of a subject (in surveillenca conditions) and map it into the "high quality" domain, where recognition will be easily carried out.

2   Work Plan

T1: Study of the existing techniques for human recognition in degraded data.

T2: Design and development of the data acquisition protocol.

T3: Capture of data in controlled and uncontrolled settings.

T4: Data annotation.

T5: Report writing.

3   Academic Prerequisites

• Interest about Artificial Intelligence and Machine Learning topics.

• Programming skills *Python* (+ *Keras or Pytorch)*.

4   Expected Results

- 1 computational prototype
- 1 report

5   Contact

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