Real time human activity detection under dark lighting conditions

PROJECT ID: 4

Project name: Real time human activity detection under dark lighting conditions

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(Design architecture/ HCI/ mobile/ distributed/ algorithms/ DB / computer vision)

In a modern house where there are several CCTV cameras, it is beneficial to have a system to detect intrusion and suspicious activities by people. For this we need to have a way to plug in some AI tools to detect humans and classify human actions. The objective of this project is to build the necessary software platform and interfaces for users to get alerts when a human is detected in the premises, identify their faces etc using existing AI tools in real-time. Your system should be ideally scalable with a number of cameras in parallel. Furthermore, the system should provide an interface to analyze old video footage for human appearances, specially in dark/night-vision lighting conditions. This project should focus on adapting and optimizing existing AI tools and also on engineering the software platform/ data processing workflow to allow users to easily plugin AI systems and provide alerts via a mobile app.

Declare a suitable scope of work sufficient for a group of 3 students; it should be sufficiently complex and substantial for a three credit module.

1. You are free to come up with your own ideas to define the requirements.
2. You should creatively define the problem domain, think of the main requirements, and additional features that can be added to this project.
3. When designing and implementing the system, you should think about performance aspects as well. What design and implementation concepts will help to increase the performance. You should measure the quality metrics (performance, accuracy, resource utilization, execution time, etc.) and improve the algorithm to increase the performance.
4. Consider the project deployment in a free cloud server
5. The final output, the tool should be accessible (mobile app and a suitable web front end for administration)

Resources and references

1. Github repositories
    a. https://github.com/sahanediriweera/SLIoT-CCTV-Human-Detection
2. Youtube
    a. https://www.youtube.com/watch?v=Ro36g2PEkBo
3. State of the art HAR
    a. https://www.v7labs.com/blog/human-activity-recognition
4. HAR in dark lighting
    a. https://xuyu0010.github.io/arid.html

b. http://cvpr2022.ug2challenge.org/track2.html