AUTOMATED ATTENDANCE SYSTEM USING DEEP LEARNING PRINCIPLES

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B. TECH CAPSTONE PROJECT

ABSTRACT- A significant portion of the time allocated to a faculty for teaching purposes is consumed on the task of taking attendance of the students presently attending a class. This is an issue because it takes the valuable time of teachers which could be spent on more productive tasks such as teaching and interacting with students and also leads to an increase in chaos and a loss of decorum in the classroom. Further, the presence of proxy attendance also plagues the existing method of manual attendance keeping. To counter these issues, an automated attendance system is proposed; which keeps track of students attending a particular class with the help of a continuous stream of pictures captured from a video streaming device located inside a classroom connected to the remote server with the help of Information and Communication Technology (ICT). The proposed solution would reduce the amount of time spent by the faculty on taking attendance, and would also lead to a reduction in chaos inside a classroom. The proposed method, termed as DPAAS (short for Deep Learning Assisted Attendance System), uses Deep Learning principles to identify the individuals present in a classroom environment. There are certain issues such as the need of multi-class identification for multiple individuals in any given classroom, as well as factors such as occlusion, differing light scenarios etc. that need to be taken into consideration while implementing DPAAS. Multi class identification in the context of Face Recognition has been a heavily researched topic, and the current state of art systems for object detection and localization include deep learning architectures such as R-CNN[1], Fast and Faster R-CNN[2,3], YOLO[4], YOLO(v2), and Overfeat[5]. This work compares the results of the state of art implementations, and uses the best fit architecture which provides the lowest false positive and false negative rate on evaluation. The chosen architecture is fit into the end to end solution proposed, which makes use of the ICT paradigm to connect a live stream of pictures obtained from a camera located inside a classroom to a remote server, via a thin client, where the majority of the necessary computing work is performed. The queries to the remote servers are in the form of images, which are obtained from the live camera. The images are processed and fed into a deep neural network which identifies the individuals present inside the frame, the details of which are returned to the thin client. The procured result is of the form of a list of students present, with their details such as registration number, student name and class room. This result can be automatically synced to the attendance system to provide an automatic updation of attendance without any human intervention.

References

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