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Independent Study & Mentorship

21 February 2023

Hardhat Detection on mobile application

# Getting Started

Since the completion of the Original Work, it was evident that more could be done to improve it, thus leading to the Product Proposal. New crucial information that there are surveillance cameras that watch over construction workers to make sure they have proper usage of personal protective equipment (PPE) and that a lot of workers do not wear hardhats due to inconvenience was obtained through an interview and small talk with Memphis, a former ISM student. During the creation of Original Work, there was no focus on a specific area to address. However, with the newly gained information, for Final Product, the focus is now shifted towards the creation of object detection to make sure workers are wearing hardhats. On top of that, a mobile application using that object detection will be created so anyone has access to the software and hopefully increase the rate of proper hardhat usage. This will lead to an overall increase in safety at construction sites.

# Mentor

Rahul Mukherjee is a professional who loves problem-solving with data and is currently pursuing a Master’s in Business Analytics at The University of Texas at Dallas. In the past, he has worked as a Data Engineer where he was responsible for running large-scale production data systems, building scalable back-end systems across the data stack, implementing ETL processes, and building dashboards at Bosch. He also trained a neural network to improve its accuracy while he was doing his internship at PurplAS. Last summer, he worked as a Data Analytics instructor for the CS Outreach program at The University of Texas at Dallas for more than 80 high school students interested in learning more about Business Intelligence, Data Analytics, Python, Microsoft SQL Server, and Tableau. Adding to his pre-existing knowledge and experience in the field of data science, his objective is to learn more about both the technical and business aspects of how data-driven decisions are made. For the Final Product, he will help greatly in various aspects. Currently, his advice from his experience in annotating images will help in the production of this product and will be discussed when meeting with him next time. He has been busy recently, so hopefully, the next meeting will be soon to continue the progression of the product.

# Research

Although not necessary, research has been done on different versions and applications of YOLO (‘You Only Look Once,’ an open-source algorithm for object detection) to grasp a better understanding of how to utilize YOLO. The research has helped in understanding what to do, what benefits there are for using YOLO and its different versions, and what could be achieved using YOLO.

# Creating the Product

There has not been a lot of progress on the product itself yet. A meeting with a mentor is yet to be, and the limitation of the equipment available limits the progress. However, these will be addressed quickly by getting a meeting with a mentor and making sure my product is going well and borrowing computers that have nVidia graphics cards to use the CUDA cores it has in order to create the custom object detection.