Proposed title: Enhancing Efficiency and Safety on the Production Floor: Real-Time Object Detection Using Computer Vision**.**

In the contemporary manufacturing landscape, ensuring the efficiency and safety of factory operations is paramount. Traditional methods of monitoring and quality control often rely on manual inspection, which is not only time-consuming but also prone to human error. The advent of computer vision technology offers a promising solution to these challenges. This capstone project proposes the development of a real-time object detection system tailored for factory or production line environments. By leveraging advanced computer vision algorithms, the system aims to automate the detection of objects, defects, and safety hazards, thereby enhancing operational efficiency and workplace safety.

Objectives

- To develop a real-time object detection system using state-of-the-art computer vision techniques capable of identifying various objects, defects, and potential safety hazards on a production line.
- To assess the accuracy and efficiency of the system in real-world factory settings, ensuring it meets industry standards for speed and reliability.
- To integrate the system into existing factory operations, demonstrating its capability to work in concert with other digital tools and machinery without disrupting workflow.
- To evaluate the impact of the system on operational efficiency and safety, using quantitative metrics such as the reduction in manual inspection time, decrease in production defects, and fewer safety incidents

Expected Outcomes

The project aims to deliver a fully functional real-time object detection system with demonstrated potential to improve factory operations by:

- Reducing dependency on manual inspections, thereby speeding up the production process.
- Increasing the detection rate of defects and hazards, leading to higher product quality and safer working conditions
- Providing valuable insights into production line operations, which can be used to further optimize processes and reduce waste.