Internship Report – NullClass

# 1. Introduction

This report presents a summary of my one-month internship experience with NullClass, conducted from May 21, 2025, to June 21, 2025. During this period, I worked on real-time machine learning projects focused on age and gender detection using deep learning and computer vision. The internship provided a great opportunity to apply theoretical knowledge into practical applications with real-world relevance.

# 2. Background

With a background in Data Science, I joined NullClass to enhance my practical skills in deep learning. The tasks assigned to me focused on training custom CNN models, working with image datasets, and integrating these models into real-time systems using Python and OpenCV.

# 3. Learning Objectives

- Learn to build CNN models from scratch.  
- Gain hands-on experience in image processing and real-time video stream analysis.  
- Implement data logging and evaluation metrics.  
- Understand deployment and integration of ML models into GUI-based applications.

# 4. Activities and Tasks

The internship consisted of the following three tasks:  
  
1. Age Detection using the IMDB-WIKI dataset.  
2. Senior Citizen Identification using real-time webcam feed.  
3. Age-based Entry Restriction system for a horror roller coaster.  
  
Each task required model training, real-time inference implementation, and structured output logging.

# 5. Skills and Competencies

- Python Programming  
- TensorFlow & Keras  
- OpenCV  
- Streamlit GUI (optional integration)  
- Data Handling with Pandas  
- Evaluation Metrics (MAE, Precision, Recall)  
- Git & GitHub for version control

# 6. Feedback and Evidence

The tasks were submitted with organized folder structures, trained models, evaluation metrics, and detailed documentation. Daily reports were submitted via the official NullClass portal. Positive feedback was received for proper execution and adherence to guidelines.

# 7. Challenges and Solutions

One of the main challenges was managing large image datasets and optimizing model training within system memory constraints. This was addressed by preprocessing and resizing images, and using generator-based data loading. Also, integrating real-time detection smoothly with inference logic was a learning curve that improved with testing and iteration.

# 8. Outcomes and Impact

The internship strengthened my understanding of deep learning pipelines and their real-time deployment. I gained confidence in implementing full ML systems — from dataset preprocessing to deploying models with GUI support and live camera feeds. This experience significantly enhanced both my practical skills and resume portfolio.

# 9. Conclusion

This internship was a valuable learning experience that bridged academic knowledge with practical implementation. I successfully completed all three tasks as per NullClass requirements, submitted them on time, and documented the work. The internship has equipped me with the technical and problem-solving skills necessary for real-world machine learning roles.