Department of Aerospace Engineering
Faculty of Engineering & Architectural Science

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Instructor: Dr. Reza Faeighi

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Machine Learning: Project 2 Report

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Results

Figure 1: Training and Validation Accuracy/Loss

The model demonstrated steady improvement in training accuracy, reaching a peak of approximately 82%, while validation accuracy showed fluctuations across epochs. This suggests that the model was learning the features but showed small discrepancies, potentially due to slight overfitting or limited validation samples. The training and validation loss both decreased over time, with training loss steadily improving and validation loss occasionally spiking. This pattern is normal for neural networks and shows that the model was learning effectively. However, the validation performance could be better, and adding more data or adjusting the model's settings could help it work better on new, unseen data.

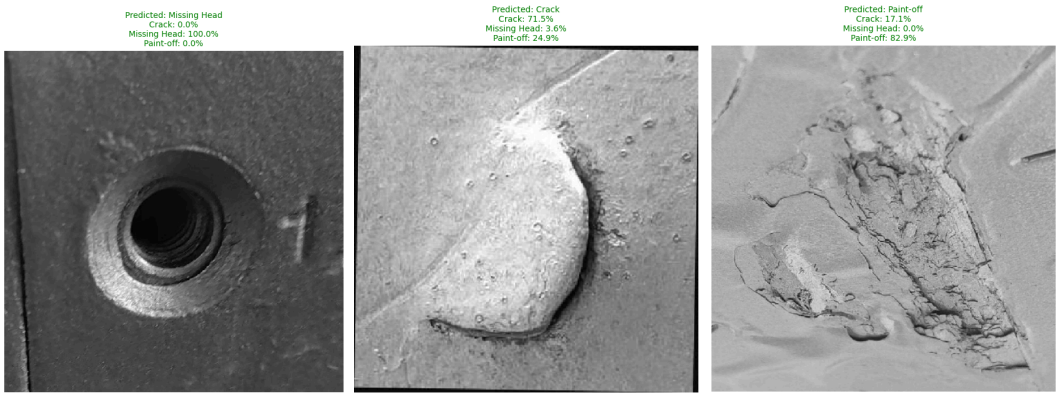

Figure 2: Model Testing

When testing, the model successfully identified the defects with high confidence. It predicted the "Paint-off" defect with 82.9% confidence and the "Crack" defect with 71.5% confidence. The "Missing-head" defect was predicted perfectly with 100% confidence. These results show the model’s strong ability to detect defects, particularly excelling in identifying "Missing-head," while leaving room to improve consistency and accuracy across all defect types. Overall, the predictions highlight the model's potential for automating defect detection effectively.

GitHub Link: https://github.com/mohd13k/Project-2