

DAMAGE DETECTION MODEL

Miniproject

TEAM 2

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ABSTRACT

Rockets are a critical factor for space exploration and military. Therefore, ensuring the reliability and safety of rockets is of utmost importance. So we should ensure a better quality analysis section (QA) in the assembling of each of its components.

One of the critical factors that affect the safety of rockets is the detection of damages in their components. Earlier it was done manually which is difficult process. Early detection of damages can prevent catastrophic failures and save lives. However, detecting damages in rocket components is a challenging task due to the harsh environments and limited access to the components.

Thus, our project aims to develop a standalone system for damage detection on rocket components using machine learning techniques. The system will use images of the rocket components along with labels to train a damage detection model and to classify between undamaged and damaged components.

The trained model will be integrated into the standalone system, which will be capable of processing real-time images to detect any damages in the components. The system will be tested on a dataset of simulated damage scenarios to evaluate its accuracy and performance.

The proposed standalone system has the potential to improve the reliability and safety of rockets by enabling early detection of damages, which can lead to timely maintenance and repair.

Features

- Data security of the component are not accessible to other parties, which can hamper sensitive components.
- Model is able to detect damages of components from images with accuracy of 75% and above.
- A standalone product which doesn't interact with another network.
- Classification of damages from images is possible.

Modules

Module-1 (Image Preprocessing)

It includes processing the images and rescaling it. Improving the number of images by data augmentation. Images are classified as different category of damages.

Module-2 (Model Developing)

It includes developing a model with core implementation in Convolution Neural Network model.

It includes the process of taking an image as input and based on the feature extracted by the model the output is predicted.