

Call for Master Thesis

Preliminary title:

Developing a Pipeline for Serialnumber Detection for Passenger Aircrafts

Motivation:

Visual inspections (see Figure 1) are crucial for ensuring the safety and reliability of aircraft in the aviation industry. Despite their importance, visual inspections are often conducted manually, which may not effectively detect anomalous parts or regions within an aircraft. The absence of a standardized and high-quality procedure underscores the need for innovative solutions to enhance the maintenance process. The identification of serial numbers is critical for quality assurance in aircraft inspections. Traditionally, serial numbers are read manually and recorded in systems, which is prone to human error and time-consuming. Leveraging Optical Character Recognition (OCR) technology automates this process, significantly improving accuracy and efficiency

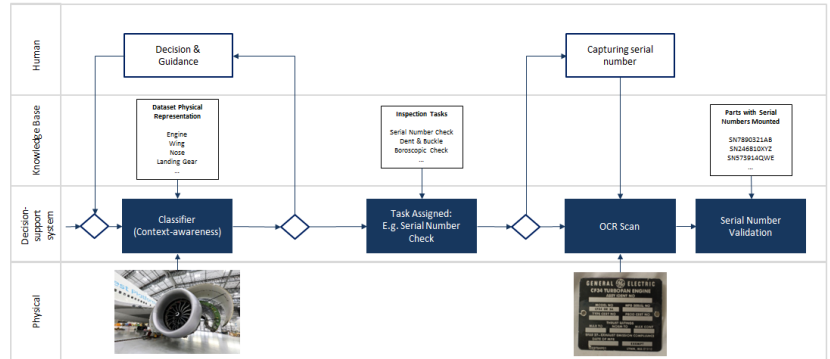


Figure 1: Process flow of serial number recognition depicted across four domains (physical level, cognitive assistance system, knowledge database, and human).

Goal:

This Master’s thesis focuses on developing a robust pipeline for detecting serial numbers on aircraft plates (see Figure 1), utilizing advanced technologies integrated within the Microsoft HoloLens 2 and conducting testing directly on aircraft.

Tasks:

- **Principles:** Acquire proficiency in C Unity development, OCR development for text recognition, and practical application of Augmented Reality (AR) headsets such as the Microsoft HoloLens 2
- **State Of The Art:** Literature review on diverse OCR technologies and develop pipelines specifically tailored for OCR applications in AR device
- **Practical:** Developing a Unity C pipeline for AR development using MixedRealityToolkit, including (1) the integration of a trained ONNX network for scene classification and (2) incorporating the developed OCR aircraft plate detection algorithm.
- **Use Case:** Conducting system tests on an aircraft within the Vienna Airport hangar.

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