

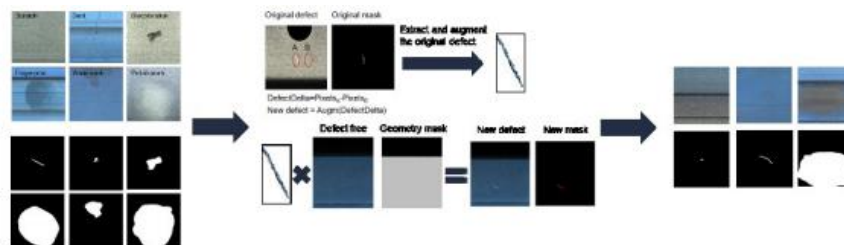
# Master Thesis - Comparison of augmentation methods for image data of metallic surfaces (15 Credits – 1 student, starting January 2024 or later)

## About us

GKN Aerospace is the world's leading multi-technology tier 1 aerospace supplier. With 55 manufacturing locations in 15 countries, we serve over 90% of the world's aircraft and engine manufacturers. We design and manufacture innovative smart aerospace systems and components. Our technologies are used in aircraft ranging from the most used civil aircraft to the world's advanced 5th generation fighter aircraft and the Ariane orbital rockets used by ESA

## Project Background

For the automation of inspection tasks for aerospace components, machine learning is seen to play a major role. However, it comes with challenges such as data scarcity, which complicate the creation and application of industrial machine learning tools. Data scarcity is a particular problem in aerospace manufacturing, as the produced volumes are low and defects are rare to occur. Thereby, augmentation methods become a central part in building datasets for machine learning. An additional advantage of the augmentation process is that the defect data can potentially be transferred between different use cases. Especially the latter shall be investigated during this thesis work.



## Assignment Description

Different methods for augmenting real flaws from an arbitrary kind of metallic surface onto another arbitrary kind of metallic surface should be compared, and the best algorithm for creating virtual flaw images across use cases should be found:

- Literature review on relevant augmentation methods and virtual flaw concept
- Familiarize with the image data available for the thesis work
- Setup test scripts for the most promising augmentation methods
- Create augmented image dataset containing virtual flaws
- Define method for validation and compare the results of the augmentation methods
- Document the conducted investigation in a detailed report.

## Qualifications

- Enrolled in Masters program in any kind of engineering, with strong interest in Machine Learning
- Interest in CNNs and vision based ML
- Initial experiences with Python programming
- Any kind of industrial or production experience is favourable.

## Apply by

Please send your resume, a list of your courses, and other relevant certificates to:

[nikhil.masinete@gknaerospace.com](mailto:nikhil.masinete@gknaerospace.com)

[philipp.westphal@gknaerospace.com](mailto:philipp.westphal@gknaerospace.com)

