

## Trustworthy machine learning for damage detection on aircraft

### Job Description

Mainblades Inspections is on a mission to change the way inspections are performed for large commercial aircraft. Our company develops data-driven technology, focused on automation of the complete inspection process: from autonomous drone flight, to damage detection and assessment of visual data, all the way to automated reporting. Our automated drone inspections for aircraft allows for a more rapid and effective inspection on any location, enabling our customers to *keep their aircraft off the ground*.

### Scope and objectives

A key aspect of the automated inspection is the ability to detect damage from the images the drone is capturing of an aircraft, making use of computer vision techniques and machine learning algorithms. For computer vision applications, deep convolutional neural networks (CNN) gained a lot of momentum due to their empirical success on visual recognition tasks.

Typically, neural networks approximate a conditional probability distribution over the possible labels given a certain input image. However, when confronted with images that are outside of the training distribution, this can be problematic. For this very safety critical application in the aviation industry, it is important that some sort of measure is returned, that indicates if the neural network prediction can be trusted or not.

The resulting output must be interpretable by the people that will use the neural network. This assignment has a very practical orientation and we are aiming to have a demonstratable solution at the end of the internship.

### Requirements

#### What you bring to the table

For this 2-3-month internship, we are looking for a talented and enthusiastic MSc student (or BSc student with suitable experience), with programming experience in Python and a solid background of statistics/machine learning. Furthermore, we are looking for people who like to be seriously challenged and easily adapt to change. You contribute with innovative ideas to the company and have a shared responsibility to make our vision a reality. Above all, we are looking for someone with a dedication for mastering new topics and a willingness to learn.

#### What we bring to the table

*A comfortable and fun working environment:*

- Collaborating with a young, dynamic and multidisciplinary team in an innovative start-up.
- Testing of your research on an available drone inspection platform in a real-world application.
- Datasets and computational resources to conduct your research.
- Unique chance to be part of a high-growth, successful start-up.
- Possibility of extending the internship into a MSc-thesis assignment.

If you think you got what it takes, and you are up for the challenge, take the first step and apply now! If we're interested, we'll reach out and take you through our recruitment process.

