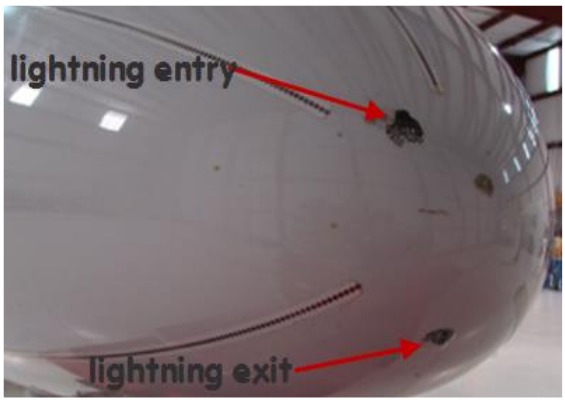
Damage detection for drone inspections of aircraft using deep learning

Introduction

Mainblades Inspections is a start-up based in The Hague, with a focus on performing aircraft inspections with drones. The company aspires complete automation of the inspection process; from the flight all the way through damage detection and assessment of visual data, and reporting. We are currently cooperating with several industrial partners in pilot projects. Our automated drone inspections for aircrafts allow for a more rapid and effective inspection on location, allowing us to keep airplanes off the ground.



Research 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 algorithms. For computer vision applications, deep convolutional neural networks (CNN) gained a lot of momentum due to their empirical succes on camera images [1]. Since CNNs learn directly from the data, they are able to uncover useful clues for discriminating between targets and background, when compared to engineered rules and features. *Therefore, the project focuses on the development of an damage detection framework that uses CNNs, or other deep learning approaches.* The algorithms should:

- Detect damages such as lightning strikes, using a limited but growing amount of training data.
- Perform at least as well as a human experts who evaluate an aircraft visually.

Initially, the algorithms can to be developed in post-processing. Eventually, the algorithms should be able to run on-line and in real-time, however not onboard the drone - this can be done at the ground station which also serves as a communication link between the drone and the cloud.

Opportunity

We are looking for a talented and enthusiastic MSc student, preferably with some programming experience and a background in computer / robot vision, deep learning, or related fields.

Furthermore, we are looking for people who likes to be seriously challenges 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. We offer the following:

- 9-12 months thesis assignment at Mainblades Inspections.
- 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.

Interested?

If you are interested, you can apply directly by contacting us at applications@mainblades.com.

Bibliografie

[1] K. He, G. G. (2017). Mask R-CNN. *arXiv prepint arXiv*.

MainBlades Inspections B.V.

Taco Scheltemastraat 5
2597 CP The Hague
The Netherlands

+31 (0) 6 30 11 50 33
applications@mainblades.com
www.mainblades.com