DEEP LEARNING MASTER THESIS (M/F/D)

⊘ now   Master Thesis

Remote

FARMING REVOLUTION

Farming revolution GmbH is a company from Ludwigsburg in Germany. The goal is to provide farmers with a sustainable and economical alternative to current weed control solutions. The core competence of the young company is a robust AI-based plant detection and efficient electromechanical hoeing units. The Farming GT is farming revolution's first product: an all-electric, four-wheel drive hoeing robot that safely and autonomously keeps farmers' fields free of weeds.

Founded in 2020, farming revolution has embraced a remote work culture from the very beginning. With flexible working hours and no central office, much of the development work can be done from your home or preferred location, without the hassle and costs of commuting. For everything that cannot be done remotely, we do have a varying number of testing locations in Germany, Spain and other parts of Europe. We are a young team of enthusiasts on a mission to make plant cultivation more sustainable.

TASKS AND RESPONSIBILITIES

- Farming revolution builds robots that mechanically weed fields in a fully substainable way. To enable the robots to distuingish between crops and weeds, camera images are captured and predictions are made with deep learning techniques. Even though the model is already trained on a massive amount of data, the appearance of plants in different regions vary hugely. Data quality by means of diversity becomes more important than the amount of data.
- To address this problem, farming revolution captures and stores continuously image data from its robot fleet on various fields. The question that arises is: Which of the data is worth being labelled?
- In this master thesis, active learning techniques making use of uncertainty and diversity sampling should be investigated, implemented, and evaluated. Examples in this area include Bayesian Active Learning by Disagreement (BALD) and BatchBALD.
- In addition of making use of these techniques for deciding on which images to label next, also experiments should be conducted if those techniques can be applied to create warnings on fields whenever the classification certainty drops and unexpected conditions are recognized.

REQUIRED QUALIFICATIONS

- Solid understanding of Deep Learning techniques for computer vision, especially semantic segmentation and object detection, and their related fields (e.g., net layers, evaluation metrics, loss functions, finetuning of nets, data pipelines, etc).
- Profound experience with Python, Tensorflow, OpenCV, Git, and Linux tools
- Good starting point for an Active Learning overview: https://jacobgil.github.io/deeplearning/activelearning

Please apply online at farming-revolution.com/en/careers.

Simplify sustainable agriculture and make it
affordable for every farmer