

## **Project title**

Dansk:

Vurdering af lejesæd ved hjælp af billedbehandling og maskinlæringEngelsk:

Lodging score assessment using image processing and machine learning

## **Supervisor**

Main supervisor:

Anders Krogh Mortensen

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Co-supervisor:

Mads Dyrmann

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## **Students**

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## **Start And End Date**

30 January 2023 - Projects begin with new semester

9 June 2023 - Project reports due

## **Project description**

In agriculture, lodging is the permanent displacement of crops, and it is a major limiting factor for the yield, quality, harvesting efficiency of the crops. In grass seed production, lodging often occurs when the grass has reached a significant height and is exposed to heavy rain and/or wind. This causes the grass to bend and snap and permanently lay down causing economical loss to the farmer.

The Department of Agroecology, Aarhus University evaluates different grasses for seed production in field plot experiments. Part of the evaluation is a manual scoring of the lodging severity on a scale from 0-100 (in 5-10 increments) of each individual plot. The scoring is performed weekly in May, June and July and is a subjective and time-consuming process. For the past 5 years, the field plots have been imaged using an RGB camera mounted on an UAV (drone), which provides a RGB and height image of each individual plot. In the images, lodging can be seen as both a change in texture as well as a change in crop height.

Previous work mainly uses very coarse scoring with either two (lodging vs. no lodging) or three classes (no, medium and severe lodging).

## Supervision plan

Weekly meetings with main supervisor. Early in the project, the students and main supervisor will find a fixed timeslot each week for supervision. Meetings may be cancelled or moved, if agreed on by both students and supervisor.

While the main supervisor is on parental leave (28. March to 15. May), the co-supervisor will provide the weekly supervision. Prior to the parental leave, the students, main supervisor, and co-supervisor will have a joint meeting.

The students will provide an agenda for each meeting at least 1 day prior to the meeting.

## Problem statement (problemformulering)

The objective is to develop an objective image-based algorithm to assess the fine-scale lodging severity of grass seed field plots.

The developed algorithm may be based on image processing, computer vision, machine learning and/or deep learning.

The developed algorithm can be evaluated against the manual score performed and/or against manual annotations in the images.

## Activity plan (Rough estimate of how we plan to execute the project)

1. Research
2. Plan solution(UML diagrams)
3. (Possible sorting of data/manage data)
4. Implement solution
5. Test solution
6. Write report

Week	1	2	3	4	5	6	7	8	9	10	12	13	14	15	16
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