Chair Digital Agriculture
TUM School of Life Sciences

Interdisciplinary Projekt – Digital Agriculture

LLM4Agri – A language based agricultural consultant

IDP Project for 3-4 Students with focus in:

- Machine learning (1-2 Students)
- App-/Web-/ & industrial Software development (1-2 Students)

Description

In many areas, AI is increasingly becoming an independent decision-making and support tool for a wide range of work. In agriculture, too, AI algorithms can take over the management of a farmer and promise to increase yields and reduce environmental impact.

Nevertheless, agriculture is a domain that has little data. In addition, acquiring field data takes a long time, is time-consuming and expensive. In contrast, a great deal of scientific and practical knowledge is stored in text and writings, which has so far remained untouched by digital algorithms. In this IDP, we want to evaluate the possibilities of large language models and how they can be used to make knowledge from texts accessible to farmers and advisors. The following topics are targeted:

1. Data acquisition and data crawling of text-based agricultural knowledge
2. training the LLM agent on specific agricultural advisory instructions and access to live databases using RAG, fine-tuning, etc.
3. develop an advisory strategy for farmers that is operational and seasonal on the one hand, but also offers long-term strategic arable advice on the other hand
4. linking the LLM agent with the Smartfield research project (www.smartfield.ai) and AI forecasting models

Work packages:

- (Brief) literature review & current research trends
- (Big) Data Crawling for LLMs & Contacting data partners
- Developing an LLM agent for agri-consulting
- Linking with the Smartfield project (software engineering)

Requirements:

- (Good) knowledge of Python and Pytorch
- (Good) knowledge of machine learning
- Knowledge of server/web development
- Motivation for agricultural topics
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Contact & Infos:
Start Summer 2025

A short mail incl. CV, project references, etc. to
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