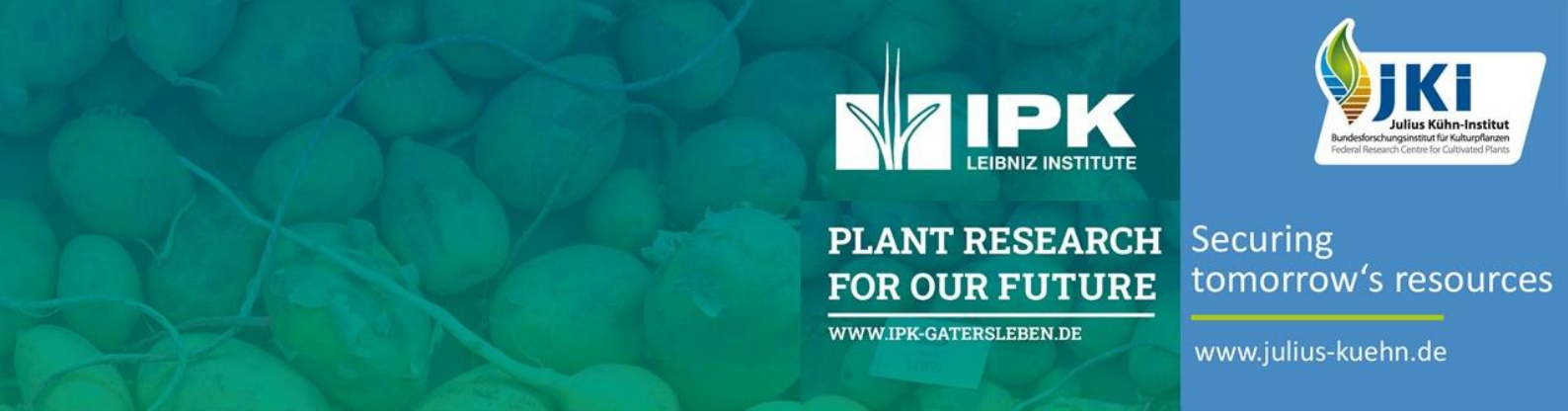

MSc thesis "Assessing Phenotypic Diversity of Potato Tubers Genebank Accessions with Machine Learning Models"

Institute for Breeding Research on Agricultural Crops - based in Groß Lüsewitz

The project

Genebank accessions are fundamental to improve potato breeding and enable the breeding of climate resilient varieties. The potato genebank collections of the IPK cover ~6000 accessions, including adapted cultivars, landraces, and wild relatives. To assess their phenotypic diversity, high throughput phenotyping is needed. Historical images of the genebank collection are available. In this project, we want to characterize the diversity of the genebank accessions based on historical images with the help of machine learning methods.

Research activities and methods

The activities of the current project involve (but are not limited to):

- Develop and evaluate an image analysis pipeline:
    - Automate resizing and contour finding of images
    - Use Deep-Learning approaches with convolutional neural networks (CNN), which are robust to variable image background and image quality to extract features
- Predict tuber shape parameter, tuber size, tuber colour
- Perform phenotypic diversity analysis

Qualification and interest

We are looking for candidates with the following qualification and interest:

- Enrolled in a graduate program in (bio)informatics, quantitative biology, agricultural science, or related fields.
- Willingness to learn image analysis processing
- Interest to learn machine learning algorithms
- Interest in statistical analyses and interpretation.
- Competent in written and spoken English.
- Motivation and good work ethics.

Our offer

- a research oriented MSc thesis at the interplay between the Leibniz institute of plant genetics and crop plant research (IPK) and the Institute for Breeding Research on Agricultural Crops which is part of the Federal Research Center for Cultivated Plants (JKI).
- an international and multi-disciplinary group with expertise on biostatistics, quantitative genetics, plant genomics, molecular genetics, plant breeding, bioinformatics and plant physiology working on current topics of breeding methodology and crop genetics.
- an enabling working environment and friendly colleagues, state-of-the-art plant cultivation facilities, laboratories and an experimental field.
- Our institute can be reached within 17 minutes by train from Rostock central station.

More information

For further details on project description and application, please contact

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