

Master Thesis

A climate-satellite foundation model to generate environmental remote sensing images

Background:

Foundation and generative models have gained much attraction in the past recent years due to their large potential to create realistic images or text given a certain input prompt.

In environmental modeling, we often develop models to forecast future climate conditions (e.g., crop yield).

These models are often fed with weather forecasts or climate projections.

However, there is a lack of future remote sensing data, as no future projection models for them exist.

We want to close this gap and develop a foundation model that can generate remote sensing images given a certain climate condition.

Start: Flexible, by agreement (From summer semester 2024 on)

Goals:

The goal of this master thesis is to develop a generative foundation model that can generate a sequence of daily remote sensing images given an input prompt that considers specific locally conditions (coordinates, weather, land cover, etc.).

The time sequence should consider flexible start and end date (e.g. 01st January – 30th October) and should generate daily images for a given coordinate.

Therefore, we aim to train and a develop a foundation model trained on historical remote sensing images and climate conditions.

Finally, we want to host your model and make it available to the (scientific) community.

Your profile:

- Good python skills
- Record of taken DL & ML lectures
- Experience (or the willingness to learn) in handling massive data sets
- Basic knowledge of computer vision

Optional:

- Experience working with remote sensing images
- Experience with environmental/climate modeling

Contact person:

Chair of Digital Agriculture

Malte von Bloh

Liesel-Beckmann-Straße 2, 85354 Freising

Room 1-7

Malte.von.bloh@tum.de