Chair of Renewable and Sustainable Energy Systems
Department of Electrical and Computer Engineering
Technical University of Munich

TUM

Master/Bachelor thesis, IDP, Research Internships (Deutsch/English)

Backend Development - Data Engineering/Science

Background

Our chair deals with energy system modelling of different spatial and temporal resolutions to find optimal solutions regarding economic benefits, external costs and environmental impacts. This modelling and optimization involves a lot of data that needs to be managed accordingly. For this reason, we are dealing with database systems and developing interfaces between existing tools and data pipelines. For example, we integrate external databases and APIs for data retrieval and analysis. The detailed description of the topic will be individually defined based on the current requirements in our projects and your profile.

Requirements

- Progamming skills (mainly based on Python)
- Interest in computer science topics

Expected work areas

- Data management and handling
    - GIS-/Data management via PostgreSQL, PostGIS and TimescaleDB
    - Design and create database models
- Data pipelines
    - Create data pipelines via Dagster and dbt Labs
    - Apply and configure docker containers
- Interfaces and APIs
    - Design and create interfaces / APIs
    - Implement web server via Apache, Ngnix, Django or Flask
    - Implement QGIS webserver and webclient
- Data Science/ Machine Learning
    - Clustering
    - Outlier and anomaly detection
- Improvement of existing tools (GUI, computation time, code structure)
- Open for further suggestions

Learning outcomes

- Application of knowledge computer science topics
- Experience with energy system modelling
- Experience with data management and interfaces

If you are interested in one of these or any related topics, please feel free to contact me.

Contact

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