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Optimisation Research Internship in ClimateAdaptation

Mitigate - Oslo, Norway - English

WHO WE ARE

Mitigate is a climate tech start-up founded in **June 2021**, building software **for insurance companies** to protect properties from **physical climate risks** such as floods, landslides, or heat. Within the last nine months, Mitigate has secured investments from venture capital investment funds, established partnerships with large insurance companies and built up a world-class multi-disciplinary group of experts. The team you will be part of for your internship counts **nine employees and ten nationalities**, and we offer a very fast-paced environment for our employees to learn and grow. **A successful internship will result in a permanent employment offer to join Mitigate.**

CONTEXT

Physical climate risk is characterised by the material threat of a physical asset such as a building to natural hazards. To correctly assess this risk, it is essential to consider both the **asset's exposure and vulnerability to any given hazard**. We use a combination of data sources, including **climate models, satellite images, geological and hydrological datasets**, to characterise the risk of each property.

Numerous measures can be applied to reduce risk. Such measures can be applied to the building or the surrounding area. However, each is associated with a **specific cost and efficiency and comes with physical limitations**. Our objective is to find the optimal set of complementary measures that can be applied to a given property or group of properties to reduce this risk.

We have secured research funding in partnership with **NGI** (Norwegian Geotechnical Institute) to work on this multi-objective optimization problem throughout 2022-2023. Your internship is an integral part of the project. Therefore, you will be exposed to both the commercial and research sides of the business.

WHAT YOU WILL DO

Nature-based solutions are actions to protect, sustainably manage, or restore natural ecosystems, that address societal challenges such as climate change, human health, food and water security, and disaster risk reduction effectively and adaptively, simultaneously providing human well-being and biodiversity benefits ([Climate Explainer: Nature-Based Solutions \(worldbank.org\)](https://www.worldbank.org/en/topic/nature-based-solutions)).

- You will first work on the literature review concerning the optimization and placement of nature-based solutions (NBS) for flood control. Then, you will propose new perspectives compared to those already existing in the company to model and solve the problem of NBS selection and placement in a multi-objective scheme. The proposed model will then be used to implement and solve them using an existing solver and metaheuristic approaches for multi-objective problems.

Deliverables

- Possibility to submit the results obtained to a journal or conference paper on the literature review and the new framework for simulation and optimization of the selection and placement of NBS
- An optimization tool for NBS selection and placement.

TECHNOLOGY

- Operational research, **multi-objective optimization problems**
- **Python** or C++
- **SQL-based databases**
- Solvers (CPLEX or similar)
- Cloud-based infrastructure (Amazon AWS, Google Cloud Engine)
- **Previous exposure to spatial, spatiotemporal modelling and GIS is appreciated**

WHO YOU ARE

- Background in **Mathematics/Operations research** or Data Science, AI, Computer Science, Software Engineering or similar
- You have a strong interest in **climate and sustainability**
- **Curious to learn new skills** and be part of a growing start-up
- Ambitious, pragmatic, and proactive
- Down to earth, you like to work in a small team and have **strong communication skills**
- You think it is vital to work in a **diverse and accepting environment**
- **Fluent in English**

The offered package is 15,000 NOK/month for a 5 to 6-month internship. The position is based in Oslo at **StartupLab, the largest and leading start-up incubator in Norway** (Forskningsparken tube station). This internship opens the possibility of continuing with a thesis and/or being hired directly by the company.

To apply:

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