

Mapping Mining: Visualising the social and environmental impacts of mining for the Twin Transition

Name of supervisors

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Preferred background of candidate(s)

We are looking for a mixed team of master students with one or more of the following background/skills:

- Design background, such as user experience (UX) or interaction design
- Programming skills
- Background in geology, human geography, anthropology and related studies

Number of available projects

One project for 3 students

Preferred project period

Eight weeks in the period June 1st until mid-August 2024

Outline of project work including expected outcomes/deliverables

The digitalisation and electrification of society, also referred to as the Twin Transition¹, requires an enormous amount of minerals and metals. Some of them are scarce, mined in conflict areas, and/or under control of one country. Growing demand may result in an increase in conflict, corruption, child labour, environmental pollution, air pollution, health hazards, and more.

In Norway, this increasing demand is addressed by allowing deep sea mining and the (re) start of mines, such as the Nussir mine² and Nordic Mining.³ These projects in Norway have become the target of protests⁴ and court cases⁵ because of the social and environmental impacts they are expected to generate.

¹ <https://www.titan.uio.no/teknologi/2023/the-twin-transition-century.pdf>

² <https://nussir.no/>

³ <https://www.nordicmining.com/>

⁴ <https://www.nu.no/stop-the-nussir-mine-save-repparfjord/>

⁵ <https://fjordsoksmalet.no/>

This project's goal is to create an online tool to visualise the social and environmental impacts of the production of some of these metals. This study is part of a larger project⁶ aiming to increase awareness of the environmental and social aspects of the production and consumption of minerals used in the Twin Transition. Rare minerals are used in servers, laptops, mobile phones, wind turbines and so on. The primary goal of the larger project is to make a physical representation, while this summer project aims to develop a smaller digital representation to support the project.

The project plan is as follows:

Week 1: Create an overview of similar projects. Data will be provided by the supervisors.

Week 2: How to represent the minerals online and what kind of information is necessary to support a meaningful understanding of the connection between minerals and the technologies using them? The output of this part of the project is a list of relevant attributes. To reduce the load of the summer project, the list of attributes should cover only two to three minerals.

Week 3-5: The main goal of the summer project is to develop an online representation, for example using a graph, with connections between minerals used in, for example, a server and its components. When clicking on a mineral, some relevant data can be presented from the list with relevant attributes of the mineral. For instance, information about the location of mines, the quantity of waste generated when mining the mineral, the social impacts of mining, and the energy used in the processing of the raw material into a material used in the manufacturing of the server. We are open to ideas for what are the relevant data to visualise!

One example of possible technology is the one developed by the MOMA in New York, showing the connection among artists working with abstraction⁷ between 1910 and 1925. Another possible formats are KUMU.io⁸ and topic maps⁹.

Week 6: After developing a first draft of the design, students should test the interaction with users.

Week 7: Development of final draft of the design, based on feedback from the test users.

Week 8: Writing the project report, which will also form the basis for a public presentation.

What we offer

- Access to the Sustainability Lab where tests can be run, and which can be used as your base for the project
- Access to some funding to perform tests
- Access to experts in metadata creation
- Weekly supervision

⁶ <https://www.sustainabilitylab.uio.no/projects/material-library/index.html>

⁷ <https://www.moma.org/interactives/exhibitions/2012/inventingabstraction/?page=connections>

⁸ <https://kumu.io/>

⁹ <https://online.visual-paradigm.com/diagrams/features/topic-map-tool/>