# Teaching portfolio

## 1. Teaching CV: A list of any lecturing and supervision tasks, including specification of academic fields, scope, level (bachelor, master, continuing education, PhD) as well as any external examiner tasks.

Teaching:
I have had the opportunity to teach various subjects at four different universities in Europe: the University of Twente (NL), Palacký University Olomouc (CZ), Georgian University (GE), and Aalborg University (DK) at both the B.Sc. and M.Sc. levels. My teaching experience can be divided into two phases: before and after my employment at AAU. During the first phase, I adopted a traditional teaching approach while delivering lectures at Twente, Olomouc, and the Georgian University. In the second phase, at Aalborg, I gained proficiency in the PBL methodology.

Phase 1: Traditional teaching approach
-In 2012, I had the opportunity to teach the 'Cartography and Geovisualization' course at Twente University. The primary aim was to impart knowledge about visualizing geographic data using interactive tools for analysis. The course covered topics such as cartographic theory, geospatial data, interactive maps, geographic information systems (GIS), etc. Furthermore, students leveraged ESRI software to create interactive maps and infographics. The course culminated with a comprehensive final exam to evaluate the understanding of the material.
-In 2012, I was responsible for teaching and designing user experiments for the 'User and Usability Issues' course at Twente University. The course encompassed usability testing, user-centred design, evaluation methodology, and the practical application of user experiments. It consisted of lectures, hands-on sessions in the usability laboratory, and a final project in which students designed an experiment for implemented map products. By the end of the course, students had gained a thorough understanding of usability testing and research, as well as the ability to contribute to product design efforts.
-In the 2015-2016 academic year, I had the opportunity to teach a course entitled "Cartography and Geographic Information Systems in Ecological Studies" at Georgian University. The course aimed to equip students with the knowledge and skills to utilize Geographic Information Systems (GIS) in ecological research, fostering a comprehensive understanding of research questions and challenges. It covered GIS concepts, technologies, and practical hands-on activities using QGIS and ESRI's ArcGIS. Students underwent mid-term and final exams, thereby developing proficiency in handling GIS software and leveraging online GEO data sources and GIS resources for effective problem-solving.
-In 2016, I had the opportunity to deliver a lecture on GeoVisual Analytics at Olomouc University as part of the Geo-visualization and Geocommunication course for Erasmus Mundus joint master's degree program students. The course centered on advanced technologies such as earth observation and geoinformation systems with the goal of equipping students with the knowledge to analyze diverse datasets for decision-making. The program is designed to prepare students to address challenges related to human society, natural resources, environmental degradation, and global climate change. Upon completion, students will possess the qualifications needed to contribute to scientific and technological advancements in the geo-domain, as well as to effectively manage environments, economies, and societies.
Supervision
-My role as a co-supervisor at Twente University was to work with master students on various use cases using the geodata sources from my PhD project. The students were tasked with conducting spatio-temporal analysis of geographical data using innovative tools and ways of thinking to visualize the data for knowledge extraction. As a supervisor, my primary goals were to ensure that the students acquired a comprehensive understanding of theoretical and practical knowledge in geovisualization and effectively applied it to their projects. My supervisory approach encompassed assisting students in formulating the problem statement, helping them grasp the relevant theory for each phase of their thesis or project, and guiding them in assimilating feedback to enhance their results.

Phase 2: Teaching at PBL University
-2017 – 2019 – I gave lectures in GIS within the course on Kort og planer for det åbne land for 6th semester civil engineering students. The purpose of this course was to teach the students the versatile use of maps, Geographic Information Systems (GIS) and geospatial data in the decision-making process in every aspect of their research. The objective was to train them to develop maps using a suitable methodology to gain a better understanding of the environment; learn how to use free open-source software QGIS - to import, explore, display and analyze geodata; experience realistic tasks in the context of domain related use case studies; etc. For the practical assignments, real-world data in relation to the student's educational background and projects were used. The students did not have any compulsory examinations for the course, but they were obliged to submit the assignments for evaluation after each lecture. At the end of the course, the students have learned and got a good understanding of: 1. the role of maps in different contexts of spatio-temporal visualizations to support various decision-making processes, 2. the application of data visualization principles for different types of geodata, data characteristics, projections, the map user, etc. into consideration.
2021 – up to now I have taught GIScience-related heretical and hands-on experience aspects at the Department of Sustainability and Planning within the following coerces:
-Sustainable Transport and Mobility course – Urban planning and transport planning (including smart transport) within the course for master's degree students in planning.
-Geovisualization and remote sensing course – Geovisualization, Spatial-temporal analysis, story-telling maps and

dashboards, and usability aspects within the course for Surveying, Geoinformatics and land Management master's degree students
-GI technology course – GeoAI, Visualization with D3 within the course for master's degree students in Surveying, Geoinformatics and land Management.
-Geocomputation and Spatial Analytics course – Network analysis, Point patterns analysis, and Spatial statistics within the course for master's degree students in Surveying, Geoinformatics and land Management.
-Geografisk informationsvidenskab og teknologi course – co-teaching this course with Henning Sten Hansen where I was supporting the students during hands-on practical exercises for Bachalor's degree students in Surveying, Geoinformatics and land Management.

Supervision
-2018 – 2019 – Co-supervisor of 9th – 10th semester thesis/projects at Aalborg University, civil engineering department, where I guided students in conducting traffic network analysis and safety-related studies using available analytical tools and equipment for their research projects. I communicated the fundamental principles of GIS, offered guidance on methodology and existing equipment, aided in analyzing statistical results, and shaped their understanding of interpreting their results so that they could independently draw their research conclusions.
-2022 – up to now – I have been supervising Master students as in groups and individual students in Surveying, Geoinformatics and land Management program.

Examinations:
I served as an internal examiner and co-examiner for multiple courses and projects over the years:
•Co-examination of the co-supervised master projects,
•Co-examiner of the geoinformatics master's students in Geovisualization and remote sensing course exams.
•Co-examiner of the Geocomputation and Spatial Analytics course exam.
•Co-examiner of the Professional Development (faglig udvikling) project exams.
•Co-examiner of the 6th semester students in Kort og planer for det åbne land.
•Examiner of the bachelor's students in Cartography and Geographic Information Systems in Ecology.

## 2. Study administration: A list of any study administration tasks, e.g. study board membership, head of studies or semester or course coordinator, accreditation, etc.

Course coordinator
2022—Up to now, I have been participating in the course coordination of the Geovisualization and remote sensing course by taking responsibility for the Geovisualization part of the lectures. In this role, I revised and redesigned the Geovisualization section program for the master's students by coordinating with teachers in Aalborg who teach the same program.
Previously, I was also involved in making decisions and proposing a GIS course program for civil engineering students within the course of Kort og planer for det åbne land. Also, as a course coordinator, I was responsible for planning and developing the GIS course for Master's students in Ecology.
2023 – coordinated the course on Geografisk informationsvidenskab og teknologi for Bechalore students and was responsible for handling the technical challenges related to the required software resources.
I also had the opportunity to assist with semester coordination last year.

## 3. University pedagogy qualifications: A list of any completed courses in university pedagogy, PBL courses, workshops, academic development projects, collegial guidance and supervision, etc.

Adjunktpaedagogikum for assistant professors, 2020
Basic course in university pedagogy, with a focus on Problem-Based Learning 2017

## 4. Other qualifications: Conference attendance, editorials, presentations, etc. relating to education, 'University Teaching Day', etc.

I regularly participate in AAU's Teaching Days, AAU Learning Days, supervisor courses, and activities related to teaching, research, and management.

AAU Learning Day 2024.
AAU Learning Day 2023.
AAU Learning Day 2022.
AAU Learning Day 2018.
Teachers meeting 2024
Teachers meeting 2023
Teachers meeting 2022
Teachers meeting 2021

## 5. Teaching activity development and teaching materials: A list of any contributions to the development of new modules, teaching materials, study programmes, e-learning, collaboration with external business partners, etc.

I am committed to the continuous development of teaching modules and programs, updating slide presentations, case studies, practical exercises, etc. to enhance both student engagement and learning outcomes in my teaching. During the lectures, students are actively engaged in applying GIS tools to solve real-world geospatial problems, fostering critical thinking and hands-on experience for solving geospatial challenges. I ensure that students are exposed to the latest advancements in the field, deepening their understanding of spatial data analysis and geoinformatics. A key aspect of my teaching involves developing educational resources using PowerPoint, live demonstrations, YouTube tutorials, web resources, and open-source GIS software resources. Provided teaching material equips them with the essential theoretical and technical skills necessary for navigating the rapidly evolving GIS landscape. I believe, my efforts to continually refine these materials not only improve student learning but also enhance their professional readiness by promoting the practical application of GIS technologies in diverse, real-world contexts.

## 6. Teaching awards you may have received or been nominated for.

Although I have not received formal awards for my teaching, the most meaningful recognition comes from my students, particularly when they express their gratitude after graduation for having been equipped with highly relevant and applicable knowledge.

## 7. Personal reflections and initiatives: Here you may state any personal deliberations as regards teaching and supervision, any wishes and plans for further pedagogic development, plans for following up on feedback/evaluations from students, etc.

As a researcher and educator in GIScience, I emphasize problem-based learning and the real-world application of geospatial technologies, integrating hands-on experience with open-source GIS tools to develop students' critical thinking and technical skills. While I regularly update materials based on student feedback, I believe further modernization of methods and tools is essential to enhance engagement in the GIS field. My latest thoughts were on exploring the potential of integrating head-mounted devices and implementing geo-applications in immersive extended reality environments, to create more interactive and engaging learning experiences for students.

## 8. Any other information or comments.

My only comment is that the master's students need more structured training in scientific writing to deliver high-quality projects. Typically, I guide my students during supervision meetings on how to structure their documents and extract relevant information from publications. However, I believe that formal training over consecutive days in a structured manner will improve their writing skills and ultimately save a lot of time for supervising project-related content.