

Doctoral researcher, Optimization Methods for
Sustainable Multisectoral Utilization of the Baltic Sea
Waterways
Aalto University

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Job Title Doctoral researcher, Optimization Methods for
Sustainable Multisectoral Utilization of the Baltic Sea
Waterways

Department T212 Department of Energy and Mechanical
Engineering

Institution Aalto University
, , Finland

Date Posted Feb. 26, 2025

Application Deadline Open until filled

Position Start Date Available immediately

Job Categories Graduate Student

Academic Field(s) Water Resources Engineering

Job Website https://aalto.wd3.myworkdayjobs.com/aalto/job/Otaniemi-Espoo-Finland/Doctoral-researcher--Optimization-Methods-for-Sustainable-Multisectoral-Utilization-of-the-Baltic-Sea-Waterways_R42437-4

Apply By Email

Job Description

Aalto University is where science and art meet technology and business. We shape a sustainable future by making research breakthroughs in and across our disciplines, sparking the game changers of tomorrow and creating novel solutions to major global challenges. Our community is made up of 120 nationalities, 14 000 students, 400 professors and close to 5000 other faculty and staff working on our dynamic campus in Espoo, Greater Helsinki, Finland. Diversity is part of who we are, and we actively work to ensure our community's diversity and inclusiveness. This is why we warmly encourage qualified candidates from all backgrounds to join our community.

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The Department of Energy and Mechanical Engineering is a leading multidisciplinary research unit with strong ties to industry and whose work has an impact on business and society. We focus on topics related to mechanics and energy engineering, where we conduct cutting-edge research and offer high-quality degree education.

The Marine and Arctic Technology research group at the Department of Energy and Mechanical Engineering is looking for a doctoral researcher on the topic “Optimization Methods for Sustainable Multisectoral Utilization of the Baltic Sea Waterways”;

Your role and goals

Finland relies heavily on maritime transports, with over 90% of its trade transported by sea. Marine waterways thus play a crucial role for the country’s national welfare and for the security of supply. While the waterways serve various forms of traffic and thereby support several UN Sustainable Development Goals (SDGs), their utilization also undermines some of the SDGs - especially SDG14: Life below water. Balancing the dynamic tension between the risks and opportunities related to the utilization of the Baltic Sea waterways is complex, considering also the increasing competition for sea space posed by green initiatives such as off-shore wind farms.

Current sustainable development efforts of marine waterways are often siloed within sectors like transport, energy, recreation, and fisheries, which can result in conflicting solutions. There is a notable lack of research on the societal aspects of sustainability, such as regional growth and development, particularly concerning the Baltic Sea. Existing studies that attempt to optimize sustainability across multiple dimensions generally focus on individual ships, assuming a static operative environment. These approaches also fail to integrate stakeholder feedback, thereby limiting their practical applicability. To address these gaps, you will develop innovative optimization methods that consider multisectoral, system-level utilization of marine waterways, ensuring that human perspectives are incorporated throughout the process. By integrating stakeholder feedback and addressing the dynamic and interconnected nature of marine systems, your work will contribute significantly to creating more comprehensive and practical sustainable development solutions.

Your network and team

You will be part of the WATERWAYS project network, which encompasses a multidisciplinary consortium of experts from Aalto University, University of Helsinki, Finnish Meteorological Institute, Åbo Akademi University, and Kotka Maritime Research Association. Within this extensive network, the closest team will be the Marine and Arctic Research Group within the Mechanical Engineering Department at Aalto University. The primary supervisor will be Prof. Mashrura Musharraf, working closely with Prof. Osiris Valdez Banda and postdoctoral researcher Dr. Mahsa Khorasani, who are also actively involved in the WATERWAYS project.

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Your experience and ambitions Posted Feb. 26, 2025, set to expire Dec. 31, 2025

We are looking for a doctoral researcher interested in studying optimization methods, particularly for environments characterized by high stakes, poorly structured problems, uncertain dynamic conditions, and ill-defined or competing goals. Suitable backgrounds may come from computer science, mechanical engineering, marine technology, and/or operational research. A strong motivation to contribute to both the scientific and societal impact of the thesis is a must. Experience in interdisciplinary research and science-driven policy formulation will be considered an asset.

Language requirements: EN: Fluency in English is required. FI: Finnish proficiency is considered an advantage but is not required. Please check the requirements for doctoral studies at Aalto University [here](#)

[url=https://into.aalto.fi/display/endoctoraleng/How%3;to%3;apply]https://into.aalto.fi/display/endoctoraleng

This role offers a unique opportunity to work on interdisciplinary research that addresses key sustainability challenges in the marine waterways. You will be part of a dynamic team driving innovation at the intersection of science and policy, developing practical solutions by incorporating stakeholder feedback and addressing the interconnected nature of marine systems.

What we offer

At Aalto University, we are committed to providing an enriching and supportive environment to help you thrive both personally and professionally. Here's what you can expect: *

Meaningful and inspiring environment: We are proud of our purpose to shape a sustainable future. At Aalto, you will have the opportunity to innovate and make significant contributions to society through research-based knowledge, creativity, and entrepreneurial spirit. *

Culture that inspires and includes everyone: All our work is guided by the values of the university: responsibility, courage, and collaboration. It's the people that create Aalto, now and in the future. We strive to be an open community where equality and inclusion foster curiosity, innovation, collaboration, and wellbeing. *

Responsible and meaningful role: Your research will have true impact on our university's success and ultimately on the wellbeing and development of society. You will be working on challenges that matter, with the potential to drive change and contribute to sustainable solutions. *

Support, coaching, and mentorship: We offer robust support systems, including access to experienced mentors, coaching, and sparring partners, to help you navigate your research journey and professional development. *

Great possibilities for competence development and learning: We are dedicated to your continued growth. At Aalto, you will find numerous opportunities for professional development and lifelong learning, ensuring you have the tools and knowledge to excel in your field.

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Our vast array of professional development opportunities means you will grow and learn, having the chance to participate actively in staff trainings and development projects based on your interests and needs. The starting salary of a doctoral researcher is about 2800€/month (gross), with a possible increase based on achievements. We value work-life balance and well-being in all aspects of life. We work in a hybrid model, with the primary workplace located at the Otaniemi Campus in Espoo. Life on the revitalized campus is vibrant, featuring stunning architecture, tranquil nature, and a variety of cafes, restaurants, and services, all complemented by excellent public transportation connections.

Join us!

To apply, please share your CV and motivation letter with us through our recruitment site ("Apply now!") latest on 28th March 2025.

Please note: Aalto University's employees should apply for the position via our internal HR system Workday (Internal Jobs) by using their existing Workday user account (not via the external webpage for open positions).

For more information about the role, please contact Assistant Professor Mashrura Musharraf [<mailto:mashrura.musharraf@aalto.fi>]mashrura.musharraf@aalto.fi. Questions regarding the recruitment system can be forwarded to [<mailto:hr-eng@aalto.fi>]hr-eng@aalto.fi

Want to know more about us and your future colleagues? You can watch these videos:

[<https://www.youtube.com/watch?v=i8zawpNMVG8>]This is Aalto University!

[https://www.youtube.com/watch?v=5k_og_6zUJQ]Aalto University - Towards a better world and [https://www.youtube.com/watch?v=ZK6pDWm1_CE]Shaping a Sustainable Future.

Read more about working at Aalto: [<https://www.aalto.fi/en/careers-at-aalto>]<https://www.aalto.fi/en/careers-at-aalto>

Check out our new virtual campus experience: [<https://virtualltour.aalto.fi/>]<https://virtualltour.aalto.fi/>

About Finland

Finland is a great place for living with or without family - it is a safe, politically stable and well-organized Nordic society. Finland is consistently ranked high in quality of life and was listed again as the happiest country in the world: [<https://worldhappiness.report/news/world-happiness-report-2024-most-comprehensive-picture-yet-of-happiness-across-generations/>]World Happiness Report 2024

For more information about living in Finland: [<https://www.aalto.fi/en/careers-at-aalto/international-staff>]Aalto Careers for International Staff .

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Contact Information

Please reference Academickeys in your cover letter when
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Contact

Finland