

Doctoral researcher in Multi-level optimization of industrial processes
Aalto University

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Posted Dec. 3, 2024, set to expire Apr. 4, 2025

Job Title	Doctoral researcher in Multi-level optimization of industrial processes
Department	T106 Chemical and Metallurgical Eng
Institution	Aalto University , , Finland
Date Posted	Dec. 3, 2024
Application Deadline	Open until filled
Position Start Date	Available immediately
Job Categories	Graduate Student
Academic Field(s)	Material/Metallurgy Chemical/Petroleum
Job Website	https://aalto.wd3.myworkdayjobs.com/aalto/job/Otaniemi-Espoo-Finland/Doctoral-researcher-in-Multi-level-optimization-of-industrial-processes_R41597

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 13 000 students, 400 professors and close to 4 500 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.

The Process Systems Engineering research group in the [url=https://www.aalto.fi/en/department-of-chemical-and-metallurgical-engineering]Department of Chemical and Metallurgical Engineering is now

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looking for a motivated

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Are you interested in modeling large and complex systems and want to understand how, for instance, processing plant and supply chain levels can interact and be coordinated in an optimal way? Have you already made your first experiences with machine learning? If you are a creative and analytical person and like mathematical modeling and programming this might be something for you!

We are looking for a doctoral researcher (“PhD student”) to work on the interesting field of integrating different decision levels of processes. Decision levels are here mainly focused on planning and scheduling of production and associated supply chains. Supply chains can relate to raw-materials, waste, product delivery, energy supply and also include elements of sustainability and circularity. In this work, the concepts of chemical engineering, operations research and computer science will meet as you may also need to deploy machine learning to support data analytics and complex decision making processes.

Your role and goals

You will be responsible for conducting research in the area of integration of supply chain and production processes, with a specific focus on developing collaborative models on how to optimally link the different decision levels. You will work in the following topics: * Create models able to embed the dynamics and flexibility of processes and related supply chains * Combine analytical and data-driven surrogate models in optimization * Implement and solve your models using state-of-the-art optimization engines * Analyze various options using life-cycle assessment approaches * Look into the sustainability of alternatives and embed these into decision making * Collaborate with experts across school borders to support the topical development *

For this specific position, the doctoral candidate will be expected to perform independent research, to collaborate with different groups, to present at scientific conferences, to publish in academic journals, to apply for research funding, to participate in the activities of the research group, and to assist in teaching activities (max 5% of working hours).

Your network and team

This position will be based in the Process Systems Engineering group led by Prof. Iiro Harjunkoski, which focuses on finding solutions on how to design and operate future production systems and supply chains using collaborative models and modern optimization tools, also supported by machine learning. Here, sustainable collaborative models play a very important role. We also work with other groups to learn more about and support topics such as circularity, recycling, hydrogen economy, etc.

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The unique competitive edge of the Department of Chemical and Metallurgical Engineering in the School of Chemical Engineering is based on sustainable utilization of raw materials, designing more efficient processes and developing new materials and products. Our department's areas of expertise enable sustainable future with high performance products and processes in circular economy and bioeconomy. The department is in a key position in research of chemical engineering, materials technology, metals processing, efficient energy technologies and digitalization of these. Our core competences include unit operations and processes in chemical engineering, hydro- and pyro-metallurgy, catalyst and polymeric materials, novel catalytic process, process control and process systems engineering.

Your experience and ambitions

We are looking for highly motivated candidates with previous experience in: * Computer-aided decision making * Mathematical modeling and optimization * Experience or interest in artificial intelligence / machine learning * Good programming skills, e.g. Python or equivalent * Supply chain planning of chemical processes, energy systems or in another relevant area

The experience should be demonstrated by evidence of success in related studies, and ideally also by some publication record. Other merits demonstrating suitability for a doctoral researcher position can also be considered.

Experience in writing research proposals for funding acquisition is an asset. Candidates should have an initiative-taking approach, should pay attention to details and have high aptitude in continuous learning, and experience or ambition to co-operate with industry. Candidates should hold or shortly receive a master's degree with good grades in a relevant field (Chemical engineering, Process Systems Engineering, Energy or Electrical engineering, Industrial engineering).

What we offer

Aalto University offers an excellent environment for driving and realizing your own research ideas, contribute to a sustainable future, stay at the forefront of research and networking by interacting with companies and other schools.

The starting date is 1.3.2025 or as mutually agreed. The first employment contract is made for one year, during which you will apply for the study right in doctoral studies at Aalto University School of Chemical Engineering. Please check the student information and admission criteria at [\[url=https://www.aalto.fi/en/study-options/aalto-doctoral-programme-in-chemical-engineering\]](https://www.aalto.fi/en/study-options/aalto-doctoral-programme-in-chemical-engineering)<https://www.aalto.fi/en/study-options/aalto-doctoral-programme-in-chemical-engineering>. Please pay attention to the mandatory skill level in English. Doctoral studies at Aalto University take approximately four years.

The starting salary for a doctoral researcher is 3000 EUR/month, and will increase over time according

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to the salary system of Aalto University.

We work in a hybrid way, and the primary workplace is Otaniemi, Espoo. The Otaniemi campus is a thriving and connected community of 100 nationalities, 13,000 students and 4,500 employees. Life at the transformed campus is vibrant and filled with amazing architecture, calming nature, and a variety of cafes, restaurants, services and good connections along the recently opened metro line.

Join us!

If you want to join our community, please submit your application no later than 31.12.2024, in English through our online recruitment system by using the link (‘Apply Now’) on Aalto University’s web page. Please note that we only accept applications via Workday.

Please including the following attachments mentioned below, in English: * Motivation letter with a short description of your research interest. Please include the applicant’s contact information and an indication of the preferred starting date (max. 1 page) * CV including details of all academic merits (including publications, if applicable), and contact information of two persons who may be contacted to provide a character reference (max. 3 pages) * Summary of the applicant’s master’s thesis (max. 1 page) * Copy of the applicant’s master’s degree certificate and a transcript of studies (with a clear explanation of the grading scale)

Please note that the position will be filled as soon as a suitable candidate is identified.

For additional information, kindly contact Prof. Iiro Harjunkoski, iiro.harjunkoski@aalto.fi.

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

[url=https://www.youtube.com/watch?v=5k_og_6zUJQ]Aalto University - Towards a better world, [url=https://www.youtube.com/watch?v=dUfEGVM-ZP8&feature=youtu.be]Aalto People , and [url=https://www.youtube.com/watch?v=ZK6pDWm1_CE]Shaping a Sustainable Future. Read more about working at Aalto: [url=https://www.aalto.fi/en/careers-at-aalto]https://www.aalto.fi/en/careers-at-aalto

Check out our new virtual campus experience: [url=https://virtualtour.aalto.fi/]https://virtualtour.aalto.fi/

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).

About Finland

Finland is a great place for living with or without family - it is a safe, politically stable and well-organized

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Nordic society. Finland is consistently ranked high in quality of life and was just listed again as the happiest country in the world: [[url=https://worldhappiness.report/news/its-a-three-peat-finland-keeps-top-spot-as-happiest-country-in-world/](https://worldhappiness.report/news/its-a-three-peat-finland-keeps-top-spot-as-happiest-country-in-world/)]<https://worldhappiness.report/news/its-a-three-peat-finland-keeps-top-spot-as-happiest-country-in-world/>. For more information about living in Finland: [[url=https://www.aalto.fi/en/careers-at-aalto/for-international-staff](https://www.aalto.fi/en/careers-at-aalto/for-international-staff)]<https://www.aalto.fi/en/careers-at-aalto/for-international-staff> .

Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

Contact

Finland