# Doctoral Researcher in Context-aware Control for Smart Orthoses
# Aalto University



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| **Job Title** | Doctoral Researcher in Context-aware Control for Smart Orthoses |
| **Department** | T410 Dept. Electrical Engineering and Automation |
| **Institution** | Aalto University<br>, , Finland |
| **Date Posted** | Mar. 1, 2024 |
| **Application Deadline** | Open until filled |
| **Position Start Date** | Available immediately |
| **Job Categories** | Graduate Student |
| **Academic Field(s)** | Electrical and/or Electronics |
| **Job Website** | https://aalto.wd3.myworkdayjobs.com/aalto/job/Otaniemi-Espoo-Finland/Doctoral-Researcher-in-Context-aware-Control-for-Smart-Orthoses_R38922 |
| **Apply By Email** | |

**Job Description**

We are looking for a highly motivated and talented Doctoral Researcher in Context-aware Control for Smart Orhtoses who would join us in our exciting project on smart mechatronic ankle-foot orthosis platform for gait assistance and augmentation (SmartANKLE).

The purpose of [url=https://smartankle.eu/]SmartANKLE is to train a new generation of highly skilled individuals with the ability to develop and bring forward biomechatronic technology for an effective translation from the workbench to the fruition by the general public. In SmartANKLE we aim to address these translational challenges in a holistic and sustainable way, by building a training network around the overall objective of bringing the Mechatronic Ankle-Foot Orthosis (MAFO) concept into the market.
Role and goals
Within the scope of SmartANKLE, the objectives of your work include design and evaluation of the

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volitional and autonomous control algorithms for establishing context-aware human-in-the-loop controllers for MAFOs. By the end of the project, your goal should be to deliver novel algorithms for sensory data fusion as well as context aware and volitional control within the context of different applications targeted by the SmartANKLE platform. This is a highly collaborative effort, and you are expected to collaborate closely with five other doctoral researchers, each working on their respective tasks across the project consortium.

As this position is a part of a training network, you will be employed half of your time (18 months) by Aalto University where you are expected to conduct your work in Espoo, Finland. The other half of your doctoral research time (remaining 18 months) will be completed in Belgrade where you will be hired by Tecnalia Serbia. Moreover, during this three-year period, you will be engaged in two 4-months long secondments, the first one taking place in Ferrara University Hospital, Italy, and the second one at University College Dublin, Ireland.

The doctoral studies will be pursued at Aalto University and the researcher is expected to commit to complete a Doctoral Dissertation (to obtain PhD degree) as part of this project. Hence, this also infers completing the necessary courses and participating in the complementary teaching and supervision activities (further information on the doctoral [url=https://www.aalto.fi/en/study-options/aalto-doctoral-programme-in-electrical-engineering]program can be found here).

Finally, given the nature of the work, you should plan, write, submit, and manage relevant ethical applications as well as conduct your work in accordance with the received approvals.
Eligibility, experience, and ambitions
As per Doctoral Network eligibility criteria, candidates should not hold a doctoral degree and should have not been residing in Finland for the past 12 months prior to the agreed upon starting date of the position.

The work will require both theoretical and practical skills in signal processing, estimation, and control and automation. It will also depend on compatible hands-on capabilities and attitude to work on real-time control prototypes for both laboratory and clinical demonstrators. You should be comfortable and eager to work and be in contact with a range of patients and healthy individuals indiscriminately of their background or individual characteristics or preferences. As a successful applicant, you should be highly motivated to conduct academic research and obtain a PhD degree.

You must have a master’s degree in either electrical engineering, control / automation, mechatronics, computer engineering / computer science, bio(medical) engineering or related areas. In addition, demonstrated proficiency in English is required. The selected candidate will need to apply for the study right in the Aalto University doctoral program and fill the [url=https://www.aalto.fi/en/study-options/aalto-

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doctoral-programme-in-electrical-engineering#6-eligibility]requirements of the doctoral program.

It is expected that you are proficient in signal processing and control algorithm design, capable of contributing to open-source hardware and software projects (e.g. Python, Matlab, C). Moreover, you should be familiar with the concepts behind real-time systems, measurement technologies and methodologies, and have some fundamentals of physiological sensing and human biomechanics.

An ideal candidate would have excellent problem-solving and analytical skills, strong communication and collaboration abilities, and ability to work independently and as part of an international research team.
What we offer
When pursuing your doctoral studies at Aalto you will receive: *
Meaningful and inspiring environment. We are proud of our purpose to shape a sustainable future. We spark the game changers of tomorrow, and renew society with research-based knowledge, creativity and an entrepreneurial mindset. *
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 want to be an open community where equality and inclusion enable curiosity, innovation, collaboration and wellbeing. *
Responsible and meaningful role with true impact in our University’s/ School’s success, and in the end, in the wellbeing and development of our society. *
Support, coaching and sparring when you feel you need it. *
Great possibilities for competence development and learning. We constantly keep learning to find the most impactful ways to empower - and invest in - our people.

The position will be filled for a period of 3 years with the starting date no later than 1st of October 2024. The salary will be based on both the job requirements, place of work and the employee’s personal performance in accordance with the salary system of Finnish universities (for the first 18 months) and Tecnalia Serbia (for the remaining 18 months). The gross starting salary for a PhD student in Finland is approximately 2700 EUR/month and approximately 1800 EUR/month in Tecnalia Serbia. Being a part of a SmartANKLE doctoral network, you are also entitled to certain travel benefits during your secondments and training/conference events, as well as funds for agreed upon project associated costs (e.g. consumables, prototyping, volunteer recruitment, …).

At Aalto we offer a wide range of staff benefits, such as occupational health care, flexible working hours, excellent sports facilities on campus and several restaurants and cafés on campus with staff discounts. While in Finland the position is located at the Aalto University Otaniemi campus which can be easily reached by public transport. At Tecnalia the position is located in our offices near Slavija

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square which is a central location and an intersection point for a large number of public transport lines, making very well connected with all parts of the town.

Team

You will work alongside Bionic and Rehabilitation Engineering (BaRE) research team that investigates engineering techniques for human-machine interfacing in order to support, augment and rehabilitate human motor function. Through advancements in basic physiology, motor control, and biomechanics, we tailor novel biosensing and control approaches, as well as design methodologies in order to push the boundaries of current state-of-the-art bionic limbs, exoskeletons and rehabilitation robots. Moreover, you will become a member of a vibrant team at Tecnalia Serbia, where young and seasoned electrical engineering researchers collaborate to enhance wearable technologies, improving human health and performance. Based in Belgrade's city center, our close-knit team proudly partners with leading European research centers, universities, and innovative companies. We frequently join and lead international collaborations across numerous EU-funded research and innovation projects.

Finally, as part of SmartANKLE project, you will work closely with five other Doctoral Researchers commencing their studies at the same time as you. They will be pursuing their studies at University College Dublin, Vrije Universiteit Brussel, and one more also here at Aalto. Moreover, apart the team at Tecnalia Serbia, you will be collaborating with experts from our industrial collaborators at Ottobock and Axiles Bionics, as well as project partners University of Michigan and Azienda Unità Sanitaria Locale della Romagna.

Join us!

To apply, please share the below listed application materials, in English, with us through our recruitment site ("Apply now!”) no later than 22/03/2024: *
A motivation letter - maximum 1 page *
CV (including, if available, a lint to the personal Git repository (e.g., github, gitlab, bitbucket) if any) - maximum 4 pages *
Description of MSc thesis project - maximum 1 page *
Educational degree certificates and official transcripts (bachelor and master) *
Contact details of maximum two referees who can be reached to provide recommendation (email address, or if not available, the referee’s phone number)

Please note that our recruitment system allows max 5 attachments, so please combine the copies of certificates and transcripts in one PDF, if necessary.

We will consider the applications on arrival and may contact suitable candidates for an interview already during the application period. We aim to have a transparent and equal recruitment process, so feel free to ask us for feedback.

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Aalto University reserves the right for justified reasons to leave the position open, to extend the application period, reopen the application process, and to consider candidates who have not submitted applications during the application period.
Further information
For further details, please contact Prof. Ivan Vujaklija (ivan.vujaklija[at]aalto.fi) or Matija Štrbac, matija.strbac[at]tecnalia.com) or Miloš Kosti? (milos.kostic[at]tecnalia.com). For submission related queries, contact HR Partner Camilla Hanganpää (camilla.hanganpaa[at]aalto.fi).
About Aalto and Finland
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 13000 students, 400 professors and close to 4500 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.

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 just listed again as the happiest country in the world. You can find more information about living in Finland [url=https://www.aalto.fi/en/careers-at-aalto/living-in-finland]here & [url=https://www.aalto.fi/en/services/welcome-to-aalto-university-and-finland-info-package]here.

To learn more about us and your future colleagues at Aalto check the following 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, [url=https://www.youtube.com/watch?v=ZK6pDWm1_CE]Shaping a Sustainable Future, and [url=https://www.youtube.com/watch?v=ftUP7zefyBY]Automation and Electrical Engineering. 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 virtual campus experience: [url=https://virtualtour.aalto.fi/]https://virtualtour.aalto.fi/
About Tecnalia and Serbia
For over 15 years, Tecnalia Serbia acts as the technology acceleration office for the Health Division of the Tecnalia Research and Innovation Foundation, Spain's leading private research entity. Our core team has consistently led medical device RnD projects from inception to technology transfer, emphasizing rapid development and immediate user engagement. We have initiated the early stages of over 30 technological assets, yielding significant intellectual property (>10 patents, >100 designs) and over 90 peer-reviewed journal publications.

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Our team comprises 4 senior researchers with PhDs in Electrical Engineering and 6 junior researchers, PhD candidates in medical instrumentation. Additionally, we collaborate with technical, medical, administrative, and legal professionals on a project basis. Our team at Tecnalia Serbia values both professional excellence and personal well-being. To support this, we offer flexible working hours, allowing our team members to achieve their best at work while enjoying a fulfilling life outside the office. This flexibility is especially beneficial in Belgrade, a city rich in cultural and leisure activities, enabling our staff to fully embrace the vibrant lifestyle the city has to offer.

Our office is ideally situated at Slavija Square in downtown Belgrade, a major transportation hub. Boasting a stunning view from our rooftop workspace, we provide an environment highly conducive to innovation. We are equipped with on-site rapid prototyping tools and positioned within a short walking distance from the Technical University campus and the Clinical Centre of Serbia, one of the world's largest hospitals. This proximity makes Tecnalia Serbia an ideal launching pad for a career in Medical Technologies R&D.

Additionally, Belgrade is an excellent place to live while pursuing a PhD. With the storied night life, leisurely cafes and a vivid culture scene, the city lives 24/7 throughout the year. The city's location at the confluence of the Danube and Sava rivers provides beautiful settings and numerous spots for relaxation, enjoyment, and sports, especially during one of the 200 sunny days we have each year.

**Contact Information**

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

**Contact**

Finland