Assistant Professor in Radar Signal Processing

Department of Signal Processing and Acoustics
Aalto University is a multidisciplinary community of bold thinkers where science and art meet technology and business.

Aalto University is a university where research, art and education are promoted hand in hand. We are committed to identifying and solving grand societal challenges and building an innovative future. With high-quality research we aim at creating significant impact on the international scientific community, industry and business, as well as the society at large. Disciplinary excellence is combined with multidisciplinary activities, engaging both students and the local innovation ecosystem.

Aalto has six schools with nearly 11 000 students and more than 400 professors. We are an international community: more than 30% of our academic personnel have an international background.

Aalto University was founded in 2010 as three leading Finnish universities, Helsinki University of Technology, the Helsinki School of Economics and the University of Art and Design Helsinki, were merged. Our campuses are located in Espoo and Helsinki, Finland.

The University campus in Espoo is developing into a unique, open innovation hub and a centre of collaboration that attracts partners from all around the world. It encourages sharing of ideas, inter-disciplinary encounters, creativity, growth and entrepreneurship. The core of the campus will be a vibrant city with versatile services and attractive places to meet.

More info at [aalto.fi](http://aalto.fi)
Creating better living environments in multi-disciplinary collaboration, changing the world through artistic means.

Steeped in the deep tradition of Finland’s cultural heritage, the School of Arts, Design and Architecture (Aalto ARTS) educates towards the future with a focus on fostering a more innovative society. Our programmes prepare students to be global citizens, offering valuable contributions to their communities with a focus on collaborative, compassionate, and unconventional solutions to some of the most pressing challenges of our time. We have close to 2,000 students and over 500 faculty and staff. 20% of our students are international.

The School has five departments: Media, Design, Art, Architecture, Film, Television & Scenography. Cooperation and interaction between the different disciplines represented at the school emphasize a human and user-centred approach in the creation of new environments.

Our research in the field of design and media is world class and on a strong international standing in both art and architecture. Other leading research areas pursued include design, digital media, audiovisual presentation, art research, visual culture and wellbeing construction, as well as community and urban construction. The school has active links to the surrounding society, business and industry, and the culture sector.

We are proud to be ranked at #9 in Art & Design education in the world.

More info at arts.aalto.fi
Our portfolio covers fields from natural sciences to engineering and information sciences. In parallel with basic research, we develop ideas and technologies further into innovations and services. We are experts in systems science: we develop integrated solutions from care of the elderly to space robotics.

Our school has about 2000 students, approximately 50 doctor’s and about 250 master’s degrees are completed annually. There are 600 members of academic staff at the School, of which 60 are professors.

The School’s five departments cover the fields of electronics, communications and automation. Special fields include automation and systems technology, electronics and information technology, power engineering, communications engineering and bioinformation technology.

The novel research results and systems solutions require committed researchers, hard-working students, modern research infrastructure, and an excellent support organization. Our international and close-knit community is one of our strengths.

More info at elec.aalto.fi
The Audio Signal Processing Research Group is working on wideband sound technology, which is extensively applicable for example in mobile phones, music technology, and noise control.

Research topics and projects of the group are related to headphone signal processing, sound synthesis and effects processing algorithms, digital filters, musical instruments, acoustic measurements, subjective evaluation, and interactive audio systems. The emphasis of the research is on digital signal processing methodology, which accounts for the properties of human hearing. Much of the academic research is conducted in collaboration with foreign partners, such as Stanford University. Professor Vesa Välimäki leads the research group.

Capturing, transmission, reproduction, synthesis, and perception of sound – these are the fields that interest the Communication Acoustics team.

The projects of the group are gathered around spatial sound. The group has developed, and is still developing, new reproduction methods for spatial sound taking into account the time-frequency-space resolution of the human hearing. These methods are applicable to multi-channel loudspeaker layouts, headphones, and binaural hearing aids. Additionally, the group is currently developing new types of non-linear beam-forming algorithms. The research group is led by Professor Ville Pulkki.

The goal of the Signal Processing Research Group is to do world-class signal processing research by focusing on fundamental signal processing theory and methods for multivariate and multidimensional signals and distributed systems.

The group has an extensive network of collaborators from world leading research universities in the Americas, Europe and Asia. Also world-class researcher training is provided to our diverse group of doctoral students. The research group is led by Professor Visa Koivunen. Others involved are Professor Sergiy Vorobyov, Professor Risto Wichman and Professor Jorma Skyttä.

Speech communication technology aims at describing, explaining and reproducing communication by speech. The focus of the Speech Communication Technology team is on fundamental research questions of speech communication. Some of the topics, particularly in speech transmission technology, are application-oriented and therefore studied jointly with ICT industry.

The research has always been characterized by its interdisciplinary nature. Joint research has been conducted across science boundaries, especially with phoneticians, brain researchers, physicians, and mathematicians. The research topics are various, but all of them address speech in one form or another. The main topics of the research are: analysis and parameterization of speech production, statistical parametric speech synthesis, enhancement of speech quality and intelligibility in mobile phones, robust feature extraction in speech and speaker recognition, and occupational voice care and brain functions in speech perception. The research group is led by Professor Paavo Alku.

The goal of **Speech Recognition Group** is to generally improve the speech recognition methodology with the help of the new algorithms developed in Aalto University. Speech recognition offers challenging benchmarking tasks for efficient algorithms that can process and learn to represent large quantities of data. In addition to improving the acoustic models of phonemes, the group aims at developing new learning statistical language models for difficult large vocabulary continuous speech recognition tasks. The relevant pilot applications in the group ranges from unlimited vocabulary continuous dictation in different languages to audio indexing, adaptive speech synthesis, and speech-to-speech translation.

At the national Center of Excellence in Computational Inference Research, the research group belongs to the flagship of Intelligent Information Access. In language modeling, speech translation, video indexing and speech synthesis we work closely together with the Adaptive Natural Language Processing, Computational Cognitive Systems, Content-Based Image and Information Retrieval, and Speech Analysis research groups. The research group is led by Professor Mikko Kurimo.

**The Speech Technology Research Group** works on developing new methods and approaches to discovering and processing patterned information within speech and audio signals.

The main focus of the team has been speech analysis, recognition and language acquisition. By closely following current knowledge related to human cognitive processes, the group is striving to apply this understanding to new technical systems that mimic human behaviour. For this reason the attention is gradually moving towards multimodal and associative information processing. The research group is led by Professor Unto Laine.

**Metrology Research Institute** focuses on optical radiation measurements and related activities.

Light is everywhere around us in the form of sunlight, artificial lighting and signaling. Most electrical equipment use either visible or infrared radiation for signaling, displays, sensing, data read-out, or digital communication. Colour is one of the most significant properties in consumer products.

Metrology research of Optical Radiation Measurements is divided into three branches:
1. Radiometry deals with characteristics of light sources and detectors
2. Photometry studies light as humans see it, and
3. Spectrophotometry investigates optical components as well as the optical properties of materials.

Some of the facilities, developed in the laboratory, are at world-leading level, when comparing accuracy, compactness, and operating costs. The group’s research concentrates on electronics, modern optics and optical radiation measurements. Metrology Research Institute is a joint laboratory between Aalto University and MIKES. It is involved in many national and international projects. Most of the research in the laboratory is currently carried out within the frameworks of EURAMET EMRP and EMPIR.

The Institute is the national standards laboratory for optical quantities in Finland, maintaining national standards of optical quantities and carrying out calibrations at the highest level. The research group is led by Professor Erkki Ikonen.

We are looking for an assistant professor to establish and lead a group of researchers and students within the radar signal processing research area at Aalto University. In this position, you will have a chance to make an impact in academic research and teaching. The research area has a huge potential for industrial cooperation as well as domestic and international defense research collaboration. Furthermore, there are many emerging application areas in health applications, automotive systems and active sensing using multisensory systems. At Aalto University, you will have excellent research facilities and opportunities for interdisciplinary research with top-level researchers in signal processing, machine learning, future radars, radio engineering, and remote sensing.

YOUR ROLE AND GOALS
Your tasks and responsibilities include conducting world class radar research and teaching as well as preparing research projects with external funding from academic funding agencies and a variety of industrial and defence related sources both nationally and internationally. You supervise and recruit PhD students, post-docs and participate in teaching within the Computer, Communication and Information Science Master’s Programme which is one of the most competitive at Aalto University.

SCIENTIFIC ENVIRONMENT
The professor position is at the Department of Signal Processing and Acoustics (in the School of Electrical Engineering) where currently world class research on statistical and array signal processing, wireless communications, optimization, machine learning, radar and multisensory systems, speech, audio and acoustic signal processing is conducted. The department has currently 9 professors and 3 of them are IEEE Fellows. It has been extremely successful in attracting funding from academic, industrial and defence sources. The department has an extensive network of collaborators in world leading academic institutes and industrial research groups. Moreover, there is a great potential to collaborate internationally through European Defence Agency, NATO Radar panel and different Department of Defence (DoD) agencies related projects. There are very strong research groups in the areas of Radio Engineering and Circuit Design within the School of Electrical Engineering, providing a critical mass of knowledge for large scale research projects in radar.

YOUR EXPERIENCE AND AMBITIONS
We expect a strong track record of publications and achievements in signal processing with experience related to radar, excellent teaching skills to help students to learn difficult topics, and motivation and competence to start and lead new and highly ambitious research projects aiming at significant scientific results and impacts. The professorship is open for qualified applicants in signal processing. We prioritize such fields which enable research collaboration with the Department’s research group of radar and multisensor systems. All applicants must have a doctorate in signal processing (or in a related area of engineering) and fluent command in English.
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READY TO APPLY?
If you want to join our community, please submit your application through our eRecruitment system no later than 4 August 2019.

To apply, please share the following application materials with us:

1. Cover letter
2. Curriculum vitae (with contact information and ResearcherID number)
3. List of publications in which the 7 most significant publications are highlighted
4. A research statement describing past research and plans for future research
5. A teaching portfolio describing teaching experience and plans for teaching
6. Contact information of possible references or at most 2 reference statements

All application materials should be submitted in English, in pdf format. The applications for the tenure track positions are to be addressed to the President of Aalto University.

From amongst the applicants in the first phase, Aalto University will select those who will be asked to visit Aalto University in September 2019.

Short-listed candidates’ applications will be submitted for review by external experts.

General instructions for applicants including evaluation criteria, language requirements and guidelines for compiling teaching portfolio and CV are given at https://www.aalto.fi/en/tenure-track.

Aalto University reserves the right for justified reasons to leave the position open, to extend the application period and to consider candidates who have not submitted applications during the application period.

More info at aalto.fi/openpositions
Why join us?

Established in 2010 as a merger of three leading Finnish Universities, we are both challenger of the old, and traditional with strong history and legacy.

Our unique combination of fields in art and design, technology and business enable multidisciplinarity and finding clever solutions for the world’s most wicked problems in the interfaces of these fields.

We aim for societal impact, educating game changers to drive sustainability.

We enjoy working at our evolving collaborative campus close to the heart of Helsinki, with good connections, great architecture and amazing nature.

We are international and diverse: more than 35 % of our faculty comes from outside of Finland. Our working environment is multicultural, widely English-speaking and its easy to settle in, wherever you come from.

We have strong academic standing and reputation in our key fields – Aalto University is among top 10 of New Universities in the world (QS ranking).

Our well-functioning and fair Tenure Track career system enables building a successful academic career, providing support for fulfilling your professional ambitions.

More info at aalto.fi
Finland is among the best countries in the world according to many quality of life indicators, including being the happiest country in the world (UN study 2018).

We are humble people, but dare to say we have one of the most advanced education systems in the world.

The Nordic values of equality and cooperation are rooted deeply into our society. We are one of the world’s top countries in press freedom and consider the many voices in our society a strength.

With high investments in R&D, a strong innovation culture, open data and advanced state of digitalization, we are a nation of innovation and entrepreneurship.

Gender equality, flexibility and low hierarchy are at the core of our Nordic working environment. Professional ambitions can be combined with a fulfilling personal life.

We are one of the world’s most reliable and stable nations with low levels of corruption and high level of safety. We are proud to provide exceptionally high standards of social security and healthcare, financed by the state.

Having four distinct seasons, clean air and thousands of lakes, we are some nature-loving people and take good care of our unique environment. We enjoy our midnight sun in the summer and northern lights in the winter.

Finnish language is known to be a bit on the complicated side, but don’t worry, we Finns are fluent in English, and have an international mindset.

We have wide and reliable transport networks, with Helsinki airport serving over 100 direct destinations. The comprehensive public transport makes it easy to commute. Our campus is situated within a 10 minute metro ride from the heart of Helsinki.

Want to live in the best country in the world?

More about Helsinki
More about Espoo
More about Finland
More about working at Aalto

More info at finland.fi
Aalto University – a community of game changers
aalto.fi