Research, Development and Innovation Programme ICT 2023: Autonomous everything

Research, development and innovation programme ICT 2023

The research, development and innovation programme ICT 2023 is jointly coordinated and funded by the Academy of Finland and Business Finland with a view to further improving Finland's scientific expertise in computer science and promoting the extensive application of ICT. The programme is based on the report 21 Paths to a Frictionless Finland (PDF) by the ICT 2015 Working Group.

At least 10 million euros of the Academy's budget authority for 2020 will be used to implement the ICT 2023 programme. Business Finland will not open a parallel call for business-related projects, but funding is available under this topic through Business Finland's normal application process (see Business Finland, Funding services).

Autonomous everything

Autonomous systems and solutions are gaining a stronger foothold pervasively in different sectors of our society. Enabled by rapid technological advancements, both the physical and the virtual worlds are being more and more automated and reaching autonomous functionalities, typically for the sake of enhanced efficiency, safety and sustainability. An important enabling element for increased autonomy in systems, machines and processes is artificial intelligence (AI) powered by the increasing capacity of computational resources and the widely available sets of data. Autonomous ships, cars and aerial vehicles are being integrated into existing modes of transport, where computer-augmented human steering still prevails. Lane assistance or information about surroundings towards enhanced situational awareness are examples of partial autonomy. The transition towards autonomy has started gradually.

The increased levels of automation and autonomy in systems and solutions is transforming our society, industry, economy and people's everyday lives. Autonomous

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systems can contribute significantly to added safety, a healthier environment and a better quality of life. They will also transform business models and value chains. However, in addition to autonomous systems being faced by a wide range of interdisciplinary technological challenges, they will also present challenges to both individuals and society at large, which all need to be carefully addressed.

The theme "autonomous everything" combines several different fields of research, such as automation technology, computer science, information technology, telecommunications engineering, hardware development, robotics, electronics, signal processing, information security, machine vision, software systems and software engineering. This thematic call will provide funding to projects conducting basic research and seeking new "autonomous everything" initiatives.

Examples of research topics:

- Autonomous systems and operations
- Remote-controlled transportation
- Autonomous vehicles (land, air, water, space)
- Reliability, risk management and transparency in remote controlled and autonomous systems
- Robotics, co-botics and soft robotics
- Social robotics and human-robot interaction
- Autonomous systems in society
- Mobile geomatics and geospatial data for autonomous systems
- Sustainable automation
- Machine learning and artificial intelligence
- Ethical AI
- Security and robustness in autonomous systems
- Software robotics and expert systems
- Distributed multi-access edge computing in autonomous systems.

The proposed projects must contribute to advancements in the concept of "autonomous everything".

How applications are reviewed

In making funding decisions, in addition to the Academy of Finland's general review criteria for research programmes (see Review criteria on our website), particular attention will be paid to the following issues:

- International engagement
    - attracting top-level young, talented researchers from abroad to Finland or hiring researchers who have recently come to Finland to work on the project
    - research visits by Finnish researchers to leading-edge foreign universities and research institutes
- Business collaboration
    - cooperation between universities, research institutes and business companies
    - problem-setting in research
    - application potential of results
- Intersectoral mobility of leading-edge researchers
    - mobility from universities to business companies
    - mobility from business companies to universities
- Use of universities' and research institutes' own resources to carry out research
    - use of resources of the site of research and the partners
    - level of commitment and funding contribution by the site of research.

The applications will be reviewed by an international panel of experts. The reviewers will use the Academy's review form for Academy Programme/Targeted call.

There will be two threshold ratings in the evaluation:

If an application does not receive at least rating 4 on the scale from 1 to 6 for evaluation item "Project's relevance to the programme/call, the review will be discontinued and the

applicant will only receive feedback on evaluation item "Project's relevance to the programme/call".

If an application does not receive at least rating 4 on the scale from 1 to 6 for evaluation item "Scientific quality and innovativeness of research plan", the review will be discontinued and the applicant will receive feedback only on evaluation items "Project's relevance to the programme/call" and "Scientific quality and innovativeness of research plan".

Consortium applications

If the funding is applied for by a consortium, read the guidelines for consortium applications. The consortium application is submitted by the consortium PI only after all subprojects have completed their applications. The non-negotiable deadline also applies to consortia. Consortium compositions cannot be changed after the call deadline has expired. If the project involves business collaboration, see the detailed guidelines below.

Business collaboration

If the project involves business collaboration, that collaboration must be clearly indicated in the research plan. In addition, your application must also include a business collaboration plan as a separate appendix.

Business collaboration plan (only one plan regardless of the number of companies, no more than 3 pages):

- List all project parties.
- Describe the collaboration as well as the management and research duties included in the project.
- Describe the mechanisms by which the project will integrate all participating organisations and individual researchers.
- Describe, if relevant, the implementation of intersectoral researcher exchange.
- Define each PI's required input to the project and justify why each party's expertise is necessary to achieve the project's objectives.
- Describe the complementary roles of the parties involved and explain which research results can be jointly utilised by the participating companies.

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- Describe the application potential of the results.
- Make sure that the collaboration plan's length and details are proportional to the size of the project. The plan should be extensive enough to ensure that the project parties will work together as one whole.

In the Academy's online services, enter as consortium parties only parties that are applying for funding from the Academy.

If the project involves business collaboration, also read item 10.1 in the Academy of Finland's funding terms and conditions.

Programme coordination

The PIs of the projects are required to

- assume responsibility for and report on the scientific progress of the project and on the use of the funds in accordance with the Academy's instructions
- ensure that the whole research team attends all events organised by the programme coordinators, and facilitate exchange and cooperation between research teams in the programme
- take part in producing reviews, syntheses and information material around the programme, and actively disseminate information about the programme's progress and results on public and scientific forums.