

Research, Development and Innovation Programme ICT 2023: Security and Privacy in Decentralised and Distributed Systems

Call opens: 1 April 2021

Call closes: 28 Apr 2021 at 16.15 Finnish time

Funding: 7 million euros in total in two calls

Funding period: 1 January 2022–31 December 2024

- can be applied for by individual research teams or consortia composed of two or several research teams; applied for to hire a research team
- funding budget for two ICT 2023 calls some 7 million euros in total
- only one application per applicant in either the Frontier AI Technologies call or the Security and Privacy in Decentralised and Distributed Systems call
- possible business collaboration must be clearly indicated in the research plan (item 3.2).

The research, development and innovation programme ICT 2023 is jointly coordinated and funded by the Academy of Finland and Business Finland. The aim of the programme is to further improve scientific expertise in computer science and to promote the extensive application of ICT. The programme is based on the report '21 Paths to a Frictionless Finland' by the ICT 2015 Working Group. At least 10 million euros of the Academy's budget authority for 2021 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](#)).

Two ICT 2023 calls will open in April 2021. The Academy's total funding budget for these calls comes to 7 million euros. The two themes are:

- Security and Privacy in Decentralised and Distributed Systems
- Frontier AI Technologies.

At the core of the Academy of Finland's activities is to provide funding for excellent scientific research. The research we fund is also expected to have high scientific and social impact. The results of Academy-funded projects must be made public and they must be produced following good scientific practice. In other words, the research must be ethical, follow the principles of sustainable development and make its results, material and data openly accessible. Equality and nondiscrimination must also be considered.

Before you fill in your application in [the online services \(SARA\)](#), carefully read the call text and the [funding terms and conditions](#). If the call text and the funding terms and conditions conflict, the terms and conditions should always be considered primary. If the translated English or Swedish version of the call text is in conflict with the Finnish call text, the Finnish version should always be considered primary.

Background and objectives

Increasing data volumes and easier access to numerous computational resources through different communication channels have created an opportunity to diversify the implementation of computation and to decentralise the management of systems, networks and services. Distributed architecture makes scalability much simpler, as new devices can be added and configured to networks without major interference. Consequently, the use of different decentralised approaches is constantly increasing in different systems. Distributed computing improves the privacy of data processing and data networks, and it is usually less sensitive to errors and also provides faster access to data. A decentralised system is typically also more fault-tolerant, more transparent and more secure, and it improves resource allocation. However, the maintenance of decentralised systems is often more complex, and they may become more prone to cyberattacks as well as data leaks and breaches. They are exposed to the same data security threats and risks as more centralised systems and their users. This covers, for example, access control, encryption, data-flow vulnerabilities, data-transfer mechanisms, middleware resources, and decentralised and distributed applications.

Real-data mining in decentralised systems may be detrimental to data protection. For example, data mining of composite time-series data from sensors, applications and other data sources may reveal information about people that they would not want to share or make publicly available to others. However, privacy protection is not always seen as a priority in data collection and analysis. Increasing the data security and privacy protection in systems may increase the computational load and reduce the accuracy and speed of the computation. Finding the right balance between these two in different applications is also an important challenge for research.

The present call focuses on advanced information security solutions that are suitable for distributed and decentralised systems in order to make them, as well as the resulting networks and services, more reliable.

Examples of research topics related to data security and privacy protection:

- Security of decentralised systems
- Blockchains or other distributed ledger technologies, as well as security, protection and privacy in blockchain-based distributed networks
- Systems of systems
- Edge and Fog computing
- Distributed trust
- Data security in 5G/6G mobile applications and systems
- Data security and privacy in intelligent IoT (Internet of Things), big data applications and cloud systems
- Usability of information security
- Data security in systems based on artificial intelligence
- Balance between data security and privacy levels and system performance.

The projects to be funded may examine and develop methods of data security and privacy protection as well as the verification of methods developed in the projects in real-world applications.

Who can apply?

The funding may be applied for by individual research teams or consortia composed of two or more research teams. The consortium parties may represent one or several research organisations.

A consortium application is an application built around a joint research plan, where each party to the consortium applies for funding. The Academy treats the consortium application as a single application, although the funding is granted to each subproject separately. Consortium compositions cannot be changed after the call deadline. [Read the guidelines for consortium applications.](#)



In addition to a doctoral degree, the principal investigator (PI) of the proposed project must also have other significant scientific merits. Usually the PI is a researcher at the professor or docent (adjunct professor) level. In addition, the applicant must have a close connection with Finland to support the implementation of a multi-year project. This connection must be evident from the application.

Special terms and restrictions

The funding is primarily intended towards the salaries of researchers who work full-time on the project and for other project costs. The PI's salary costs may, under certain limitations, be incorporated into the total project costs. Read more in the call text under 'Funding to be applied for and funding period'.

The Academy will review only one ICT 2023 application per applicant in either the Frontier AI Technologies call or the Security and Privacy in Decentralised and Distributed Systems call. If you submit an application to both calls or submit more than one application to one of the calls, we will only review the first application submitted. Applications that are not reviewed will not be eligible for funding.

If you are applying for funding and have ongoing Academy funding, you must submit an interim report in the online services on each ongoing project. [Read the guidelines on drafting the interim report.](#) If you have not submitted a final report on a completed, Academy-funded project, we may decide not to process your application.

Members of the Academy Board, research councils and the Strategic Research Council will not be granted Academy funding during their terms.

Funding cannot be granted to a person who has participated in the planning of the call to an extent likely to give them a comparative advantage over other applicants.

We will not process an application if the applicant has been found guilty of research misconduct in the three years preceding the year of the call.

Funding to be applied for and funding period

The Academy of Finland is prepared to fund research projects within the two ICT 2023 calls with a total of 7 million euros.

The funding period is three years: 1 January 2022–31 December 2024.

Academy research funding is granted to Finnish sites of research (usually universities or research institutes), unless there are special reasons for not doing so. The PI of the funded project must have a close connection with Finland to support the implementation of a multi-year project. The funded researchers may, however, spend time working abroad during their funding period.

The application must contain a funding plan drafted in line with the full cost model, including the funding to be applied for from the Academy (up to 70% of the total project costs). [Read more about the full cost model.](#)

You can apply for Academy funding to cover, for example, the following direct research costs:

- research team salaries
- PI's salary costs (under certain limitations)
- salaries of researchers returning to Finland
- essential implementation costs
- travel expenses
- collaboration and mobility in Finland
- international collaboration and mobility
- preparation of international projects.



Academy funding cannot be used for economic activity. [Read more about the eligibility of economic operators.](#)

Research team salaries

As a rule, staff hired with Academy research funding must have an employment relationship. We recommend that they be hired for a period of employment no shorter than the funding period, unless a shorter contract is necessary for special reasons dictated by the implementation of the research project. Short-term research, study or other assignments may also be carried out in the form of outsourced services, if it is determined to be necessary for the project.

What is required from the site of research?

We require that the site of research (e.g. university) provides the research project with all necessary basic facilities. These are determined based on the nature of the research and are the same as those available to other research staff at the site: office and laboratory premises, equipment (incl. computer equipment), and telecommunications, telephone, mailing, copying and library services. When accepting the funding, the site of research is responsible for ensuring that necessary statements and permits from ethics committees have been obtained before the start of the project.

The costs of ensuring immediate open access to peer-reviewed articles are included in the overheads of the site of research and are thus part of the basic facilities provided by the site. The costs associated with storing and sharing research data are regarded as overheads for the project's site of research, but they may also be legitimately accepted as research costs to be covered with Academy research funding. The site of research also commits to ensuring that the data management plan can be implemented at the site of research, and that the measures to be taken comply with good data management practice. Read more in the [guidelines on the commitment by the site of research.](#)

The application must also include the overheads percentage, indirect employee costs and coefficient for effective working hours of the site of research. The site of research will see to that this information is kept up to date in the online services.

When the site of research is a university or a research institute, as a rule, the funding must be applied for VAT included. Consult the financial administration at the site of research for more information. The Academy's funding may also cover VAT costs, but only on certain conditions (see [Value added tax](#) and read more in the [funding terms and conditions](#)).

Funding plan

In the application, provide a **cost estimate** including an estimate of the annual amount of funding needed, itemised by type of expenditure. Also include a **funding plan** that shows all funding granted for the project as well as funding that will be provided by the site of research if the project is launched. Before submitting the application, applicants must agree with the administration at their own organisation on the contribution of the site of research to the funding of the project. Only costs that pass through the books of the site of the research must be included in the total costs. **You must check with your own organisation** whether the funding planned as the own funding contribution suits this purpose. The funding applied for from the Academy must not exceed 70% of the total project costs. The cost estimate must be realistic.

All research costs must be justified in the free-text field in the online services under 'Funding for the project'.



Salary costs of principal investigator

Academy funding for research projects (Academy Projects, Targeted Academy Projects and Academy Programme Projects) is primarily intended for the salaries of full-time researchers working on the projects and for other research costs.

As a rule, funding is not granted for the salary of the project PI. However, the PI's salary costs may, **under certain limitations**, be incorporated into the total project costs. The PI's salary is entered under 'Salary of principal investigator' in the online services.

Including PI's salary for project management in total project costs

The PI's salary costs may be incorporated into the total project costs in accordance with what is stated under the tab 'Salary of principal investigator' in the online services. In order for the salary costs to be eligible, the PI's tasks must be clearly specified.

The salary costs must not be significant in relation to the project's total costs. For example, a four-year research project must not include more than six months of the PI's effective working hours. This is equivalent to approximately 1.5 months a year.

Applying for funding for PI's salary for research

The Academy may grant funding for the PI's salary for no more than a year for well-justified reasons, such as working abroad, returning to Finland or transferring to another research organisation or a company in Finland. Possible business collaboration must fulfil the terms set out in the Academy's [funding terms and conditions](#).

A condition is that the research-related reasons and the PI's tasks must be clearly presented on the tab 'Salary of principal investigator' in the online services. The funding cannot be used for this purpose unless it is mentioned in the conditions accompanying the funding decision.

Granting salary funding to PI with no employment relationship

If the PI does not have an employment relationship with, for example, a university or research institute, they must explain how their salary will be covered during the funding period on the tab 'Salary of principal investigator' in the online services.

Retired researchers can be granted funding on the same grounds as other researchers.

Mobility aid in research projects

The mobility aid is applied for as research costs related to the implementation of the research plan. The aid is applied for in accordance with the practices of the site of research.

In the online services, the aid is applied for on the tab 'Funding for the project' under 'Travel expenses'. The mobility aid must be justified. [Read more about the mobility aid](#).

How applications are submitted and become pending, publicity of applications

How to submit and supplement the application

The non-negotiable call deadline also applies to consortia. The deadline for applications is 28 April 2021 at 16.15 Finnish time.



Make sure to submit the application in good time before the deadline. The system will only accept applications that contain all obligatory information. The joint consortium application is submitted by the consortium PI. The PI can submit the consortium application only after all subprojects have tagged their applications as complete.

You can edit and supplement the application until the deadline. You can make changes to a submitted application (e.g. change appendices), but you must make them before the deadline. If you notice that your application lacks important information after the deadline, immediately get in touch with the call's contact person, so that they can reopen the application for you. Make sure to re-submit the application after you have supplemented it. We will consider the supplemented information insofar as it is possible in view of the review and decision-making process. We may ask you to supplement the application. If you do not supplement the application by the given deadline, we may decide not to process it. You must make sure that your contact details (email address) are up to date. If you have not submitted a final report on a completed, Academy-funded project, we may decide not to process your application.

An application will not be processed if the applicant or the application does not meet the competence requirements or other key requirements, or if the application otherwise does not qualify for processing. A research council or another decision-making body may decide not to process and not to fund an application based on science policy objectives or if it is apparent for some other reason that the applicant cannot receive funding with the submitted application. [Read more about the circumstances that may cause the Academy not to process or review an application.](#)

How the application becomes pending

According to section 17 of the Finnish Administrative Procedure Act and section 8 of the Act on Electronic Services and Communication in the Public Sector, the sender is responsible for the application arriving by the set deadline. An application becomes pending at the Academy when the online application and the obligatory appendices have been submitted in the online services. The system will confirm a successful submission by sending an email to the address you have provided.

Publicity and data protection

Except for the research plan, plan of intent, abstract and interim report, which are primarily subject to professional secrecy, the application and its appendices are public documents. For example, the CV is a public document and as such must not include any confidential information. This publicity is based on the Finnish Act on the Openness of Government Activities. The Academy is committed to following regulations on data protection. The GDPR-compliant privacy statement concerning the research funding process is available on our website under [Data protection](#).

Application parts and guidelines

The application consists of forms completed in the online services and PDF appendices. As an applicant, you have the right to submit your application in Finnish or Swedish, **but we ask that you to submit it in English** to facilitate the international review.

Most of the links below take you to the [A–Z index of application guidelines](#).

The online application contains the following parts

Personal data

- Personal details
- Degrees (most recent one first); parental leaves etc. may be filled in under 'Additional information'



ACADEMY OF FINLAND

- Titles of docent and professorships
- The CV filled in under the personal details will not form part of the application. The CV is filled in on the CV tab.

CV

- [CV following the template](#), no more than two pages

Consortium parties (if applicable)

- Details on each party (name, email address, organisation and country)
- Read the [guidelines for consortium applications](#).

General information

- Details on the site of research
- Title of research project in English and Finnish/Swedish
- Research fields (at least one, no more than five). [See the research field classification](#).
- Keywords in English and Finnish/Swedish

Abstract

- Maximum length 2,500 characters including spaces
- Brief overview of scientific and societal objectives, research methods and data as well as expected research results and impact
- [Read more about the abstract](#).

Research plan

- Maximum length 12 pages, 15 pages for consortium projects
- [See the guidelines on the structure of the research plan](#).
- **If the project involves business collaboration, that collaboration must be clearly indicated in the research plan under item 3.2, Collaborators and their key merits in terms of the project.**
- See the [how-to guides for the online services](#).

Most relevant publications and other key outputs

- Up to ten of your (or the consortium's) most important project-relevant publications and up to ten of your (or the consortium's) most important key outputs, with justifications.
- You can retrieve publication details from the [VIRTA publication information service](#). [Also see our how-to guide for the online services](#).
- Details on publications may also be entered manually. Obligatory information: author(s), title, year of publication, name of series/journal, type of publication (the type will not be shown in the PDF version of the application).

Mobility

- Enter information on planned national and international mobility within the project, itemised by person.
- [See more information on mobility](#).



Collaborators

- Project collaborators, itemised by collaborator (name, organisation, country)
- Describe the collaborators' project-relevant key merits and provide justifications for choosing them in section 3.2 of the research plan.
- If necessary, append a letter of commitment. See the [guidelines on the letter of commitment](#).

Affiliations

- Research infrastructures: Indicate what kinds of equipment, resources or data reserves provided by national or international research infrastructures the project plans to use. The menu includes infrastructures included in Finland's national roadmap and/or ESFRI's roadmap. Other possible infrastructures are entered in a free-text field. [Read more about research infrastructures](#).
- Centres of Excellence in Research: [Read more about Centres of Excellence](#).
- Finnish Flagships: [Read more about the Finnish Flagship Programme](#).

Research ethics

- Ethical permit for project and/or animal testing permit (yes/no)
- Found guilty of research misconduct (yes/no). We will not process a funding application if the applicant has been found guilty of research misconduct in the three years preceding the year of the call.
- The research ethics description is entered under section 4.1 of the research plan.
- [See the ethical guidelines](#).

Funding for the project

- The project's funding follows the [full cost model](#). The Academy's funding contribution to the research costs comes to no more than 70%.
- Before you can fill in the cost estimate, you must first select the site of research on the tab 'General information'.
- The site of research maintains the following percentages: effective working hours, indirect employee costs, overheads percentage and [VAT](#).
- Enter the funding period.
- Enter salaries and other costs.
- Enter other funding sources and their funding contributions. You must immediately notify us if you receive funding from other sources for the same purpose after your application to the Academy has been submitted.
- Justify the funding to be applied for. The cost estimate must be realistic.
- The [PI's salary costs may, under certain limitations, be incorporated into the total project costs](#): for project management and/or research. The justifications are entered on the tab 'Salary of principal investigator' in the online services.
- Consult the administration at your site of research when filling in budget details. Read more about the funding in the call text under 'Funding to be applied for and funding period'.
- Commitment by site of research. Make sure you have a commitment from your site of research (usually a university or research institute) to supporting the project. Read more in the [guidelines on the commitment by the site of research](#).

Salary of principal investigator

- Justifications, if [salary costs for the PI](#) are included in the funding plan



- The PI's salary costs may, under certain limitations, be incorporated into the total project costs: for project management and/or research.
- If the PI does not have a permanent employment relationship, include a salary plan for the PI for the entire funding period.
- Read more about the PI's salary in the call text under 'Funding to be applied for and funding period'.

Public project description

- Maximum length 1,000 characters including spaces
- Popular and reader-friendly description of the research project in English and Finnish/Swedish
- We will use the project description in our communications on the funded research project. The project description is also stored at [fi](#), a service that makes available information on research conducted in Finland.
- Read the [guidelines on the public project description](#).

Appendices

A. Individual application (not consortium application)

- Appendices must be PDF files.

Obligatory appendices:

- Complete list of publications. [Read the guidelines on the structure of the list of publications](#).

Case-specific appendices:

- **Business collaboration plan (see instructions below)**
- Letter of commitment: See the [guidelines on the letter of commitment](#).

B. Consortium application

- Appendices must be PDF files.

Appendices of consortium PI:

Obligatory appendices:

- Complete list of publications. [Read the guidelines on the structure of the list of publications](#).

Case-specific appendices:

- **Business collaboration plan (see instructions below)**
- Letter of commitment: See the [guidelines on the letter of commitment](#).

Appendices by PI of consortium subproject:

Obligatory appendices:

- Complete list of publications. [Read the guidelines on the structure of the list of publications](#).



Case-specific appendices:

- Letter of commitment: See the [guidelines on the letter of commitment](#).

Authorisation

- You can authorise another person to supplement or view your application.
- Start by entering the person's name in the field.
- The person must have an account in the Academy's online services (SARA).
- You cannot authorise more than one person at a time to edit a field in your application, and you cannot edit that same field while the authorisation is active.
- Do not authorise yourself.
- See technical instructions on the authorisation process in the [how-to guides for the online services](#).

Submit application

- You can submit the application when you have filled in or attached all the necessary information.
- A red warning triangle on the tab tells you that some information is missing.
- You can supplement the application until the deadline. Resaving will replace the earlier version.
- If you want to supplement the application after the deadline, please get in touch with the contact persons listed in the call text.

Interim report

- If you are applying for funding and have ongoing Academy funding, you must draw up an interim report in the online services on each ongoing project before the call deadline. [Read the guidelines on drafting the interim report](#).
- Also see the [How-to guides for the online services](#).

Instructions for drafting business collaboration plan

If the project involves business collaboration, that collaboration must be clearly indicated in the research plan under item 3.2, Collaborators and their key merits in terms of the project. In addition, the application must include a business collaboration plan as a separate appendix (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.
- 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 familiarise yourself with the [Academy's terms and conditions](#) concerning business collaboration.

How the application is reviewed

Academy of Finland funding is granted based on peer review. We mainly use foreign experts as reviewers.

The review of applications follows a single-stage process. The applications will be reviewed by an international panel. The panel drafts one review report on each application. The review report is subject to professional secrecy.

Review criteria

- how the project supports the objectives of the call
- scientific quality, innovativeness and novelty value of the research as well as its impact within the scientific community
- competence of applicant/research team in terms of project implementation
- feasibility of research plan (incl. research ethics)
- quality of research environment and collaborative networks
- researcher mobility and researcher training
- added value of collaboration between consortium parties.

Read the review questions that will be used in the review: [ICT 2023 review form](#) and [review guidelines](#). The review guidelines and form are only available in English.

Two threshold values will be used in the review

The threshold rating for the 'Project's relevance to the programme' item is 4 on a scale from 1 to 6. If an application fails to meet this rating, the review will be discontinued and the applicant will only receive feedback on that item.

The threshold rating for the 'Scientific quality, novelty and innovativeness of the research' item is 4 on a scale from 1 to 6. If an application fails to meet this rating, the review will be discontinued and the applicant will only receive feedback on two items: 'Project's relevance to the programme/call' and 'Scientific quality, novelty and innovativeness of the research'.

Funding decisions

The Academy's Research Council for Natural Sciences and Engineering will make the funding decisions in late 2021.

In addition to the general review criteria of Academy research programmes, the following issues will be considered:

- 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
- cooperation with the private and public sectors
 - 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.

You will receive an email notification after the funding decision has been made. After receiving the email, you can log in to the online services with your user ID to view the decision and its justifications. A positive funding decision will be accompanied by the funding terms and conditions. In the online services, you will also have access to the review report, which may include the panel ranking (panels rank the best applications).

How to receive the funding

A positive funding decision is accompanied by the funding terms and conditions. Make sure to check the decision and accept the funding and its terms in the online services without delay. This must be done via the Academy's online services **within eight weeks of the decision date**, unless otherwise stated in the special conditions of the decision notification.

Before you accept the funding, also update the project description (if necessary), make changes to the annual instalments (if necessary) and attach [the full data management plan](#) (only the consortium PI). Once you have accepted the funding, the system will send a notification to the commitment issuer at the site of research. That person must also accept the granted funding.

The funds can be paid only after the applicant and the representative of the site of research have accepted them. The system will then notify the funding to the finance administration of the site of research, whereupon the funds will be ready to use.

Contacts

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- Our email addresses are in the format `firstname.lastname(at)aka.fi`.