

netherlands



Call for Proposals

Open Call for Small-Scale Initiatives in Machine Learning

(OpenSSI 2021)

Training and consultancy

Purpose of this call

This call for proposals supports researchers who expect to benefit from machine learning or deep learning, but who need additional expertise in applying these methods. Applicants must represent a team of researchers as indicated below.

The call is organized around an intensive workshop followed by several months of consultancy.

As a small-scale initiative, this call follows a lightweight procedure without the possibility of appeal.

About the eScience Center

The Netherlands eScience Center is the national centre for innovative software solutions in academic research. Our aim is to bridge the gap between digital technologies on the one hand and scientific and scholarly inquiry on the other. Bringing together knowledge, people and institutions, we build and apply software to enhance the use of digital technology in research. Our vision is to establish a robust research community, in which all investigators in all domains are able to exploit advanced digital tools and methods to answer research questions, keeping the Netherlands at the forefront of cutting-edge international research.

We use our extensive knowledge of advanced digital technologies and methodologies as well as software development to help define and solve research challenges. We share our ideas and the research software we develop.

Experts who develop digital tools and methods for research, i.e. build 'eScience software', are called Research Software Engineers or RSEs. The Organisation for Economic Co-operation and Development (OECD) offers the following description of RSEs: "A growing number of people in academia combine expertise in programming with an intricate understanding of research. Research Software Engineers may start as researchers who spend time developing software to progress their research. They may also come from a more conventional software development background and are drawn to research by the challenge of using software to further research."

The eScience Center's RSEs are highly qualified researchers with expertise in digital technologies and methodologies. They are the equivalents of postdocs and/or assistant and associate professors and, in some cases, the top-level technicians employed by universities.

Open science, reproducibility and sustainability

Collaborating with the eScience Center requires applicants to support the use and development of standards-based open-source and FAIR solutions¹.

- open science means that data, methods and results are freely available under open licences
- reproducible research means that researchers with access to data and software are able to reproduce the research results in so far as these are based on that data and software
- software is sustainable when it is easier to reuse software than to replace it

¹ FAIR Data Principles, see <https://www.go-fair.org/fair-principles>
FAIR Software Recommendations, see <https://fair-software.nl>

To support the wider research community while ensuring the reproducibility, transparency and integrity of all the research activities carried out at the eScience Center, all output (such as software and publications) is made available as open access and data is offered as FAIR data. All source code is made publicly accessible on a software development platform (e.g. GitHub), while all software and documentation use permissive open-source licences.

In addition, the eScience Center guarantees quality by employing best practices in research software development, such as modular software architecture, version control, unit and integration testing, the use of online collaborative environments (e.g. Jupyter) and software citation.

The eScience Center's default mode of operation is to reuse existing code and solutions that meet our quality standards, or can be made to do so.

Available projects

This call makes available in-kind support by allocating the time of Research Software Engineers (RSEs) employed by the eScience Center to the project. The eScience Center's in-kind contribution is calculated in 'person years' or PYR, where 1.0 PYR represents 1,680 hours of RSE time available for the duration of the project.

The total budget available for this call is approx. 3.3 PYR. A maximum of 0.25 PYR (approx. three months) will be allocated to each awarded project, which means a total of 11-13 projects can be awarded. The total duration of each project must be between 3-8 months and will be agreed upon before the project commences. The projects have to be started and completed in 2021.

Who can apply?

Proposals can be submitted by researchers from a Dutch research performing organisation. This is defined as a university or a research institute affiliated with NWO or KNAW (See Appendix A).

Lead Applicant

Each proposal is to be formally submitted by a single named researcher (henceforth the 'lead applicant' or LA) on behalf of a group of researchers (the 'research team'). The LA :

- must be in possession of a PhD and
- have demonstrable knowledge and experience in applying digital methodologies to research and
- be free to spend a significant amount of time on the proposed project (to be specified on the application template) and
- may submit only one proposal in that capacity in this call.

Research Team

Small-scale initiatives are a collaborative effort of coherent research teams. Teams may include PhD students as well as academic staff, and represent different disciplines, faculties, levels of expertise, etc. Employees of institutes for higher education (hogeschool: see <https://www.vereniginghogescholen.nl/hogescholen>) may also participate in a research team. Research teams comprising a mix of researchers from different universities or institutes are encouraged to apply. The research team must

- consist of 3 to 5 researchers (including the LA) and
- share a strong interest in the proposed research question and
- include at least one member with programming experience and
- be free to spend a significant amount of time on the proposed project (to be specified on the application template).

What can be applied for?

Each project involves a period of intensive consultancy provided by the assigned RSEs, following a week-long workshop in which the various research teams will participate collectively. The workshop, on “*Machine Learning and Best Practices for Software Development*”, will be held on 17-21 May 2021. After this initial phase, the research teams are expected to continue their research independently, with consultancy by the assigned RSEs continuing part-time and on demand.

Research team members must be closely involved in both the initial workshop and the consultancies. The method of working is collaborative. Together with the RSEs, the research team members will share knowledge and develop and explore new ideas, thus increasing their understanding of current machine learning techniques. The RSEs will offer advice and support during the duration of the project to help the research team achieve the desired results. This includes:

- Initial brainstorming on suitable machine learning models
- Advice on designing experiments and formulating research questions
- Technical support for implementing, debugging, and training machine learning models
- Help with interpreting the results
- Contribution to the eScience component in a research paper

The research team will be responsible for data processing, coding, and the training and evaluation of the machine learning models. In addition, each project envisages the following deliverables:

- publication of a research paper and
- a blog post or white paper and
- software or code release

Both RSEs and research team members should be available for the submission / review process of the research paper after completion of the project itself. Both RSEs and research team members should be mentioned as co-authors of each of the three deliverables.

Preparing an application

Proposals must use the application template “Application template Small-Scale Initiatives in Machine Learning” available on the eScience Center website at <https://www.esciencecenter.nl/application-template-small-scale-initiatives-in-machine-learning/> Applicants should take note of the following requirements:

Data

For a collaboration with eScience Center RSEs to be successful, the research data must be available for use from the start. Before accepting a proposal, this data will be inspected in order to make sure it is ready for use. The data should be of sufficient quantity to allow machine learning. If you are unsure whether your data is suitable, please contact the eScience Center before applying.

Programming skills

Prior experience with machine learning is not expected. However, at least one team member should have sufficient programming experience to enable the research team as a whole to work together fruitfully with the RSE consultants. The project involves extensive hands-on training on how to implement machine learning solutions using Python. If you are uncertain about your computational skills, please contact the eScience Center before applying.

Submitting the application

Proposals have to be submitted by email, using the required application template. The deadline for submission is 1 March 2021, 12:00:00 (CET). Please send the filled-in application template to open-ssi-call@esciencecenter.nl.

Assessment procedure

Submissions will be reviewed by eScience experts from the Netherlands eScience Center. Criteria for selection are:

1. Quality of the proposed research in regard to the application of machine learning technologies. (25%)
2. Match between the available data and the research question(s) asked. (25%)
3. Extent to which the proposed research builds on the research teams’ skills and knowledge. (25%)
4. Expected ability of the RSEs to give the proposed research a boost through digital technologies. (25%)

The projects will be spread as evenly as possible across the following discipline areas (note that the lists are not exhaustive):

- *Physical Sciences and Engineering* (mathematics, physics, astrophysics, chemistry, engineering, computer science, earth sciences, climatology, environmental sciences, agricultural sciences)
- *Life Sciences* (biology, medical and health sciences incl. neuroscience)

- *Social Sciences and Humanities* (economics, political sciences, law, sociology, anthropology, education sciences, communication studies, psychology, linguistics, philosophy, literary studies, archaeology, history, human geography)

The lead applicants will be informed on the decision by email on April 1st 2021. Unsuccessful applicants will receive a short motivation.

Timetable

1 February 2021	Start of submission period
1 March, 2021, 12:00:00 (CET)	Submission Deadline
1 April, 2021	Notification of acceptance
17 May – 21 May, 2021	Workshop
May – December, 2021	Consultancy period
31 December, 2021	Last possible end date for projects

Contact details

If you have specific questions about this call for proposals and the assessment procedure, please contact: open-ssi-call@esciencecenter.nl .

Appendix A

1. Universities

Erasmus Universiteit Rotterdam
Open Universiteit Nederland
Protestantse Theologische Universiteit
Radboud Universiteit Nijmegen
Rijksuniversiteit Groningen
Technische Universiteit Delft
Technische Universiteit Eindhoven
Theologische Universiteit Apeldoorn
Theologische Universiteit Kampen
Universiteit Leiden
Universiteit Maastricht
Universiteit Twente
Universiteit Utrecht
Universiteit van Amsterdam
Universiteit van Tilburg
Universiteit voor Humanistiek
Vrije Universiteit Amsterdam
Wageningen Universiteit en Researchcentrum

2. KNAW-instituten

Hubrecht Instituut voor Ontwikkelingsbiologie en Stamcelonderzoek
Huygens ING
Internationaal Instituut voor Sociale Geschiedenis (IISG)
Koninklijk Instituut voor Taal-, Land- en Volkenkunde (KITLV)
Meertens Instituut
Nederlands Herseninstituut
Nederlands Instituut voor Ecologie (NIOO)
NIOD Instituut voor Oorlogs-, Holocaust- en Genocidestudies
Nederlands Interdisciplinair Demografisch Instituut (NIDI)
Westerdijk Fungal Biodiversity Institute

3. NWO-instituten (NWO-I)

AMOLF - Physics of functional complex matter
ARCNL - Advanced Research Center for Nanolithography
ASTRON - Netherlands Institute for Radio Astronomy
CWI - Centrum Wiskunde & Informatica

DIFFER - Dutch Institute for Fundamental Energy Research

Nikhef - Nationaal instituut voor subatomaire fysica

NIOZ - Koninklijk Nederlands Instituut voor Onderzoek der Zee

NSCR - Nederlands Studiecentrum Criminaliteit en Rechtshandhaving

SRON - Netherlands Institute for Space Research