Helmholtz AI projects 2021 call

09 August 2021

Background

The Helmholtz AI Cooperation Unit[1] (Helmholtz AI) permanently and strategically drives and coalesces the field of applied Artificial Intelligence within the Helmholtz Association. As an interdisciplinary platform, Helmholtz AI compiles, develops, fosters, and promotes Artificial Intelligence-based approaches for all Helmholtz Centers.

One essential component is funding research projects that address the topics of applied Machine Learning (ML) and Artificial Intelligence (AI). These annual calls for projects are based on the general concept for Helmholtz AI and are in line with the future topics of the Initiative and Networking Fund (INF). Supported projects initiate cross-cutting research collaborations and identify innovative research topics in this area; they underpin the growth of the Helmholtz AI network within Helmholtz and with external partners; they support the transfer of scientific knowledge from research into practice; they include the opportunity to access and employ computing resources of HAICORE.

Objective of funding

The objective of this third call for Helmholtz AI projects is to initiate and facilitate activities that address cross-center challenges and methods; it aims at several smaller collaborative projects with the potential to facilitate larger follow-up projects; it fosters co-development of solutions with potential users and encourages the practical implementation of science-based know-how outside the scientific community (e.g. with companies & non-profits).

First results are expected by mid-2023, i.e., one year after funding starts. The results shall contribute to the vibrant Helmholtz AI community, fertilize cross-center collaborations, incentivise transfer activities and contribute to international visibility.

Goals

A Helmholtz AI project addresses two overarching goals:

    1. exploit new Machine Learning, Statistical Learning and Artificial Intelligence
    approaches in the applicants' research field(s), and

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[1] Concept for Helmholtz AI:
https://www.helmholtz.de/fileadmin/user_upload/01_forschung/Helmholtz_Inkubator_HAICU.pdf

2. foster interaction and method transfer between application domains, research fields (in and between Helmholtz Research Areas), and sectors (with industry or other partners).

In order to allow for vigorous exploration of new approaches and to encourage disruptive ideas, Helmholtz AI projects explicitly call for 'high risk, high gain' project proposals and value (fast) failure over incremental advances. Projects should address, if appropriate, reproducibility and explainability. Where applicable, projects are co-created and iteratively developed with users and further stakeholders (including universities and entities from outside the scientific community). Activities within projects should strongly impact research at participating Helmholtz centers and should contribute to the overall development of the Helmholtz AI community within Helmholtz and transfer activities (e.g. with external application-oriented partners).

Thematic criteria and general requirements

Projects shall be aligned with the goals formulated in the Helmholtz AI concept. Applications that meet the following criteria will be evaluated based on the award criteria (see below in "Evaluation process, selection, and award criteria").

1. Thematic criteria

   a. Projects shall focus on data analysis, method application and method development (or similar activities) in line with the above goals.

   b. Projects with a substantial share of or focus on data collection, data preparation/ cleaning or validation are not eligible for funding.

2. General requirements

   a. Helmholtz AI projects shall combine substantial and reasonably balanced contributions from scientists from at least two Helmholtz centers.

   b. Helmholtz AI projects shall contribute to Helmholtz' transfer objective through one or more of the following:
   ○ Inclusion of relevant external partners such as companies or non-profits;
   ○ Outlining how the project achieves the maturation of (preliminary) findings and results, e.g. advancing the Technology Readiness Level (TRL)
   ○ Outlining a sound and implementable exploitation strategy

   Funding Funding will be provided only for Helmholtz centers; in clearly documented cases of indispensable expertise, funding may also be provided for a highly qualified university partner (within Germany).

   c. Applications shall outline deliverables that can be achieved over the course of the funding period and demonstrate tangible outcomes. First deliverables need to be envisioned 12 months after the start of the project (non-limiting list: e.g. publication of a software or generated reference data set, policy/white paper, educational material, communication material). Applicants shall describe the expected results and impact of the project for the participating Helmholtz centers, the Helmholtz

Association, the research field and regarding actually expected or potentially pioneering transfer activities beyond the scientific community (e.g. industry uptake, spin-offs, economic & social contributions).

d. A concise cooperation and management plan of the project should comprise effective communication, participation and decision-making mechanisms between the Helmholtz centers and external partners.

e. Applications shall describe how a swift start of the project is ensured following the funding decision (e.g. hiring, data provision), as projects are expected to commence as soon as possible after the funding decision. Ideally, the proposal should name, where appropriate, candidates for intended positions and describe how the AI and ML expertise needed for the proposed project is ensured (e.g. in-house through proposed PIs or new hires or through the involvement of external partners).

f. Helmholtz AI projects can apply for a total volume of € 400k or more in total for a running time of 2-3 years: a maximum of € 200k can be applied for from the INF, and matching financing of at least the same amount must be provided by the participating centers themselves. The latter has to be confirmed with a signed letter from the board of directors when submitting the application.

g. Staff, travel expenses and cost for consumables are eligible for funding; investments are excluded. The draft financial plan shall cover the full running time of the project.

h. It is encouraged that a list of independent experts who could serve as potential reviewers may be provided. Proposed experts must be unbiased (criteria are published with this call, see appendices).

i. Applications submitted for Helmholtz AI projects must not have been submitted to another funding line of the Helmholtz Association; revised resubmissions of previously unsuccessful Helmholtz AI project proposals are welcome.

Rights and Obligations

1. During the funding period, project leaders commit to actively participate in Helmholtz AI cross-field activities, such as progress workshops, method exchange workshops or hackathons.

2. Funded project Principal Investigators (PI) commit to acknowledging financial support through the Helmholtz AI projects funding line in any related published output.

3. Funded project PIs commit to share short updates about ongoing related activities (e.g. for publication on the website www.helmholtz.ai and associated social media channels) requested by the Helmholtz AI science management regularly.

4. Annually and at the end of their respective funding period, all Helmholtz AI project PIs shall submit a short written (final) report demonstrating progress and results (referencing

deliverables) to Helmholtz AI central and the Helmholtz AI scientific advisory committee. These reports form part of the general reporting of the Helmholtz AI platform.

Applications

1. The application consists of:

a. Cover page and abstract (information to be entered in the online submission tool)

b. Main body (max. 5 pages) and appendices (work packages, deliverables, financial plan, board's confirmation letter, CVs and, if applicable, resubmission statement) in a single PDF file

2. The application shall be written in English. The main body and appendices shall be formatted in DIN A4, Arial, 11pt, 1" margin and single line spacing (a template is published with this call, see appendices).

3. The application's main body structure is:

a. Scientific case

b. Unique and ambitious approach

c. Utility of AI/ML methods and/or data sets

Please note that the methodology description should not merely list options or remain at surface level, but explain in detail which choices are made and how these will help address the research question(s) and challenges at hand.

d. Long-term impact and transfer potential

e. Implementation and management

4. Important elements on the cover page (information to be entered in the online submission tool) include:

a. Project title and acronym

b. Up to 10 keywords

c. Names and contact information of the lead center's (coordinator) and further centers' Principal Investigators

d. Names of participating centers and external partners

e. Budget

5. CVs of the principal investigators and, if available, CVs of likely prospective candidates for a specific position should be submitted in the appendix. Please note that your CV should also contain references to relevant accomplishments beyond scientific papers and citation metrics (e.g. software packages, policy papers, standards, datasets, patent filings, entrepreneurship and industry collaborations). Please make sure to highlight people with required ML and AI expertise (if any).

6. A declaration, usually a signed letter, by the board of directors of participating centers must be included, which guarantees that their own funds will match at least the amount

applied for from the INF.

7. The application may include a list of up to six unbiased independent experts (information to be entered in the online submission tool) with relevant expertise in the methodological aspects of the application, at least half of the nominees should be female; such experts could be invited to participate in the panel meeting.

8. Revised resubmissions of previously unsuccessful Helmholtz AI project proposals must be accompanied with a brief description of changes applied (max. 1 page).

9. An incomplete application may lead to the exclusion of the application from the selection procedure.

Evaluation process, selection, and award criteria

Proposals are subject to the following evaluation procedure. Proposals are first checked regarding formal requirements and then evaluated by a panel of independent experts. The panel performs a pre-assessment of all applications prior to the selection meeting (no presentation). Based on the pre-assessment, the panel deliberates to reach a final assessment and recommends a list of projects for funding. Ultimately, the President of the Helmholtz Association decides which projects shall be awarded INF funding.

Proposals will be evaluated by a panel of experts, on the basis of the award criteria 'ambition', 'research impact', 'methodology impact' and 'quality and efficiency of the implementation'. In line with Helmholtz AI's 'high risk, high gain' approach, the criterion 'ambition' is weighted with 1.5.

Award criteria	Aspects
Ambition (weight 1.5)	- Extent to which the proposed project is beyond the state of the art, demonstrates unique innovation potential (e.g. ground-breaking objectives, novel concepts and approaches) and takes on risk - Clarity of the objective(s) - Soundness of concept and credibility of the proposed methodology
Research impact (weight 1.0)	- The extent to which the output(s) of the project would contribute to advance the specified research field(s) - The potential to contribute to establishing and strengthening long-term cooperation between the partners.
Methodology impact (weight 1.0)	- The extent to which the output(s) of the project would contribute to advance the development/implementation/use of the specified method - The potential to exploit and disseminate the project results within Helmholtz and with further partners

Quality and efficiency of the implementation (weight 1.0)	- Quality and effectiveness of the work plan, including the extent to which the resources assigned to work packages are in line with their objectives and deliverables - Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role - Complementarity of the partners and balance of expertise - Readiness of applicants to commence the project within the timeline indicated in the call

The evaluation procedure and the handling of proposals will be jointly managed by staff at the Helmholtz Association Head Office and Helmholtz AI central (at the Helmholtz Zentrum München). The panel evaluation meeting will be managed by the Head Office.

The scientific leadership of Helmholtz AI (i.e. the scientific director and steering board members) will have no access to submitted proposals or assessments at any stage during and after the evaluation procedure. They will not contact the panel of experts.

Schedule

Date	Event or action
August 2021	Announcement of Helmholtz AI 2021 project call
1 September 2021	Submissions accepted for Helmholtz AI projects via online submission portal: https://application.helmholtz.ai
1 December 2021	Application deadline
December 2021	Proposals are checked according to formal criteria. Proposals meeting the selection criteria are reviewed and scored by panel members according to award criteria
January 2022 - March 2022	Panel members review and score proposals according to award criteria and meet to decide which projects to recommend. The President decides which projects to fund.
March-April 2022	Funding contracts between Helmholtz Association and submitting centers are drawn up.
April 2022 onwards	Start of Helmholtz AI projects

For further inquiries, please contact via email:

• Helmholtz AI central: Meike-Jana Kalb via projects@helmholtz.ai

• Helmholtz Head Office: Dr. Patrick Gilroy via inkubator@helmholtz.de

Appendices

1. Application template

2. Criteria for bias/conflict-of-interest

3. Information about the processing of personal data