

Publication policy for collaboration with Helmholtz AI consultants

Approved by the Helmholtz AI steering board on January 14, 2021.

Version 1.0

Rationale and introduction

Machine learning (ML) and deep learning (DL) are subsets of applied artificial intelligence (AI), which consist of statistical learning algorithms and are summarized hereafter as AI. [Helmholtz AI consultants](#) are researchers who engage in scientific collaboration with other researchers through the Helmholtz AI voucher system. Any resulting scientific output shall appropriately reflect the nature of such collaboration and the respective contributions through authorship and acknowledgement.

This policy ensures that creative work performed either by designing and writing of project-relevant code or research software infrastructure, including routines for handling raw data, preparing data sets, workflows, etc., is adequately appreciated. It will also ensure the proper acknowledgment of stimuli and ideas originating in designing and adapting machine learning as part of collaborative projects that may have a domain background on one hand and machine learning requirements on the other.

In order to ensure a fair publication policy for Helmholtz AI consultants, the processing of a Helmholtz AI voucher is clearly divided into contributions that lead to co-authorship, mentioning in the acknowledgements or not needing a mention at all. The policy addresses the specific forms of common work and strong dedication of Helmholtz AI consultants in the development of AI-based solutions, resources and tools.

Before submission of a publication (peer-reviewed or pre-print) it must be forwarded to the respective consultant, irrespective of the kind of acknowledgement. In case of disagreement, the issue can be addressed to the Helmholtz AI steering board (contact@helmholtz.ai).

This document sets out the generally binding publication policy for researchers collaborating with Helmholtz AI consultants. To safeguard good scientific practice, please adhere to the [Guidelines for Safeguarding Good Scientific Practice](#) provided by the German Research Foundation (DFG - Deutsche Forschungsgemeinschaft).

These guidelines set out the overarching conditions and responsibilities of authorship:

“An author is an individual who has made a genuine, identifiable contribution to the content of a research publication of text, data or software. All authors agree on the final version of the work to be published. Unless explicitly stated otherwise, they share responsibility for the publication. ...”

The examples given below should provide guidance on how to apply this general principle in the context of the collaboration of Helmholtz AI consultants and other researchers, acknowledging that the judgement of whether a contribution is substantive is ultimately a judgement call and the lists can never be fully comprehensive.

The following policy and further information can also be found on the Helmholtz AI website at: www.helmholtz.ai/

(1) Authorship contributions

For each publication derived from a voucher in which a Helmholtz AI consultant was involved, the following **creative and analytical contributions** must lead to an offer of co-authorship to the contributing Helmholtz AI consultant(s) and/or team leader. Where the involved consultant has contributed according to an item on this list but declines co-authorship because either they fundamentally disagree with the overall conclusion, or because they themselves do not consider their contribution sufficiently substantial, a mention in the Acknowledgement is the appropriate form of giving credit for such efforts.

- **Conceptualization:** formulation of a conceptual design for an AI model for the particular project, this may encompass:
 - the formulation of tasks that lend themselves to AI given specific data
 - envisioning solution strategies along with necessary tools for the posed problem
 - helping to find a good solution strategy by finding severe fundamental deficiencies rendering an existing approach non-functional, making envisaged application impossible or severely impaired
- **Formal analysis:**
 - application of statistical, mathematical, computational, or other formal techniques to analyse or synthesize study data

- using existing pre-trained AI models in such a novel way that it enables solutions or insights into scientific problems that were not possible before
- reproduction of published results (e.g. with unseen domain specific data) to support or motivate a publication
- **Investigation:** conducting a research and investigation process, specifically performing experiments or a data/evidence collection
- **Methodology:** development or design of new methodology, e.g.
 - creating solutions that substantially accelerate existing AI methods and
 - enable AI experiments that were not possible before due to intractable time for their execution
- **Model:** (de novo) creation of a model and domain adaptation, transfer of a model
- **Software engineering:** if substantial work is carried out in specific support of the voucher
 - Programming, software development and designing computer programs,
 - implementation of the computer code and supporting algorithms
 - (automated) testing of existing code components
 - continuous learning of models with updated data
 - designing or extending software code or platforms necessary to solve posed AI problems
- **Supervision:** oversight and leadership responsibility for the AI part of the research activity, planning and execution
- **Validation:** verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs
- **Visualization:** substantive contribution to figure or animation design and implementation for visualising the data and/or interpretation for a scientific audience
- **Writing:** preparation and/or creation of a publication, specifically writing of substantial sections of the initial draft, e.g. the methodology description or statistical analysis part.

(2) Acknowledgement contributions

Not sufficient on their own for authorship, but requiring a mention in the acknowledgements are the following contributions:

- Non-trivial input on improvements or implementation of already conceptualised models and designs
- provision of study materials, computing resources, pipelines or other analysis tools
- general advice on possible improvements, without hands-on work
- assessment of data quality, methodological feasibility and readiness for AI without working on the project afterwards
- Support in visualisation, particularly when related to preparing figures in a standardised format without novel concepts and limited in scope
- implementing workflows for testing, validating, improving already existing and functional models/code
- adapting or slight adjustment of already existing solutions / models for a task (without substantially changing the model itself)
- critical reviewing, commentary or revision of the publication

Resources, infos and notes

This publication policy is based on the [Contributor Roles Taxonomy \(CRediT\)](#), which was established by the Consortia Advancing Standards in Research Administration Information (CASRAI) and is included in the key-performance indicators (KPIs) of Helmholtz AI.

To ensure good scientific practice, please adhere to the Code of Conduct [Guidelines for Safeguarding Good Research Practice](#) provided by the German Research Foundation (DFG - Deutsche Forschungsgemeinschaft).

An additional [guideline for affiliations and acknowledgements in publications](#) is dedicated to a standardized affiliation and funding acknowledgement style for Helmholtz AI publications. The latter policy can be found on the Helmholtz AI website (www.helmholtz.ai).

Imprint

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