



Alexander von Humboldt Professorship for Artificial Intelligence

Programme scope information

With its Professorship for Artificial Intelligence funded by the Federal Ministry of Education and Research (BMBF) as part of the German government's Artificial Intelligence Strategy, the Alexander von Humboldt Foundation is looking to attract world-leading researchers from abroad working in the field of artificial intelligence (AI) to undertake their research in Germany. The Humboldt Professorship will be based on in-depth, cross-disciplinary understanding of AI. A more detailed outline of the programme scope is provided below.

The programme is aimed at nominees whose research focusses on **computational processes for intelligent behaviour and decisions, and their foundations, applications and effects**. One of these areas of research must typically be at the forefront, however, combinations of different areas are possible and lines are not always clear.

The aforementioned topics within AI can include e.g., machine learning, pattern analysis and recognition, knowledge-based systems, reasoning (under uncertainty), action planning, as well as robotics and autonomous systems. Basic research in these areas will be primarily rooted in computer science, with elements of mathematics and engineering. Research may also be both theoretical and experimental in nature. Research should aim to achieve a fundamental understanding and explainability of machine decision-making processes or develop/optimize widely used AI methods and tools. The latter can be a step towards a specialist application of AI, e.g. in life, natural or social sciences. Other important aspects of future AI research are development and optimisation of hardware specifically designed for AI systems.

If the focus of an application lies within the technical application of AI, this shall only be relevant for the programme where this application clearly goes beyond the pure use of existing methods and tools. This must be indicated as clearly as possible in three ways:

- 1) The research question. The use of AI methods/technologies is central to the question (i.e., the question cannot be answered without AI and a deep, extensive understanding of AI), original in its idea and innovative in its planned implementation.
- 2) The data used. New data sources will be made available by or used for AI applications, or existing data will be processed for the first time using AI.
- 3) The planned algorithms and/or AI tools are either newly developed or significantly further developed, e.g., through specialised optimisations.

The new application of AI will systematically advance the relevant research area. Where applicable, research findings should generalise well and lead to new AI applications in related areas. A distinction is made here from research projects in which the use of AI methods and tools does play a role, but is neglected in the research question, as in such projects existing data, methods, and tools are only slightly adapted from the research area in question or another area.

Research on the effects of AI usually tackles the topic from a metaperspective and looks at the philosophical, social or legal implications arising as a result of AI and its use. This dimension primarily concerns the humanities and social sciences.

The thematic scope covered by the topic of AI for the purposes of the Humboldt Foundation also has bearing on the nominees' publication lists. Depending on the research focus, nominees should have a strong presence in specialist computer science journals and conferences (e.g. AAAI, ICML, IJCAI, NeurIPS) or relevant publication outlets within the respective areas. While it is not essential that nominees are active in the core communities of AI research, it is expected that they possess clear expertise in (and across) the field of AI from their previous research.

The above information does not reflect the full extent of the AI subject area and serves only as background information for the application and review process. We hope that this information is helpful and thank you for your interest and for your valuable support in the selection process for the Alexander von Humboldt Professorship for Artificial Intelligence!