

Faculty of Science and Engineering

Profile report: Tenure Track Assistant Professor in Artificial Intelligence - Responsible & Explainable AI

- Discipline: Responsible & Explainable AI
- Level: Assistant/Associate/Full professor
- Focus: Research
- Fte: 0,8-1,0 fte

1. Scientific discipline

Artificial Intelligence (AI) is a scientific discipline that focuses on creating computer systems capable of performing tasks that typically require human intelligence, such as problem solving, decision making, and learning from data. Responsible AI is a subfield within AI that emphasizes on design methods for the ethical and socially responsible development of AI technologies, considering issues such as fairness, transparency, and accountability. Explainable AI (XAI) is a related area that seeks to make AI systems more understandable and transparent, allowing users to interpret the decisions made by AI algorithms.

2. Vacancy

This position is opened by the board of the Faculty of Science and Engineering in the context of the sector plans and will be embedded in the Bernoulli Institute, basic unit Artificial Intelligence, Multi-Agent Systems group. The position falls within the framework of the faculty's career system [Career Paths in Science and Engineering](#). As the focus domain of the position is research, the criteria of the career path with a focus on research apply. Please see the link for more information.

3. Selection committee (BAC)

Prof. dr. N. Taatgen (chair)	Scientific Director Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence
Prof. dr. H.B. Verheij	Head of department Artificial Intelligence, professor of AI and Argumentation
Dr. F. Cnossen	Education Director Artificial Intelligence & Computational Cognitive Science
Prof. dr. L.C. Verbrugge	Professor of Logic and Cognition
Prof. dr. D. Grossi	Associate professor of Multi-agent Systems
Dr. B. van Riemsdijk	Associate professor of Intimate Computing, University of Twente, External member
TBA	Student member

Advisors:

Prof. dr. L.R.B. Schomaker	Professor of Artificial Intelligence
F. Postma, MSc	HR Advisor

4. Area of expertise

The area of expertise in Explainable and Responsible AI focuses on formal and computational methods for the design of trustworthy, transparent, norm-guided AI methods, in order to support the safe and value-adding integration of AI systems into our daily lives. This multidisciplinary area requires innovative combinations of AI techniques, including knowledge representation, reasoning, learning, and human-machine interaction. Relevant research in the area includes multi-agent coordination, ethical decision making, alignment of learning and reasoning, and the grounding of knowledge in data. Examples of required AI techniques include logic, argumentation theory, computational social choice theory, social network theory, agent-based simulations, and probabilistic formal methods.

Explainable and Responsible AI has become a new and expanding area of AI. Many of the currently successful systems cannot be employed, because it is not clear what the basis for their decisions are. Moreover, if a system cannot explain its line of reasoning, there is no good way to prevent biases from affecting the outcomes. Successful application of future AI systems requires explainability to be able to be used ethically and in accordance with current and future European and national laws,

5. Embedding: institute (and base unit)

The position will be embedded in the Artificial Intelligence department of the Bernoulli Institute. The department is organized as three research groups: Autonomous Perceptive Systems (focusing on machine learning, robotics and pattern recognition), Cognitive Modeling (focusing on cognition, human-computer interaction and language) and Multi-Agent Systems (focusing on social cognition, group decision making and argumentation). This position will be embedded within the Multi-Agent Systems group.

The Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence is part of the Faculty of Science and Engineering (FSE). The profile of the institute centers around modeling, computation, and cognition with a focus on science and technology, keeping a balanced mix of fundamental and applied aspects. The Bernoulli Institute has research groups in mathematics, computer science and artificial intelligence that work together on three scientific challenges: 1. Persistent Complex Systems, 2. The Future of AI, and 3. Tomorrow's Software-Intensive Infrastructures. The institute participates in various national research schools and most of the PhD students are enrolled in an educational programme and take part in other activities offered by these schools. The institute has a leading role in the cross-disciplinary research theme on Data Science and Systems Complexity (DSSC) and in the Center "Groningen Cognitive Systems and Materials" (CogniGron) within the Faculty of Science and Engineering.

6. Local and (inter)national position

The Bernoulli Institute has strong collaborations with other faculties of the university and the University Medical Center, and participates in the Jantina Tammes school for

Digital Society, Technology and Artificial Intelligence. The institute leads a large national NWA-ORC project, HAICu, directed at the development of algorithms for digital humanities and the cultural heritage. In addition, the institute has a leading role in the 10 year NWO Gravitation project Hybrid Intelligence (2019-2029), a national collaboration between Dutch universities. Within the Netherlands, there is a growing interest in Artificial Intelligence as formulated in the NWO AI Research Agenda. Both the EU and the Dutch Government are investing significantly in AI research.

The Bernoulli institute has a strong international reputation in the area of Systems Theory, Dynamical Systems, Software Engineering and Cognitive AI, and collaborates with several international institutes, among which ETH Zürich, Stanford University, the University of Washington and Carnegie Mellon University.

7. Expected contributions to education

The candidate is expected to teach and develop relevant course modules within our ambitious BSc and MSc programmes in Artificial Intelligence, and our MSc programme Computational Cognitive Science. The candidate plays a role in developing education concerning their area of expertise. The exact topics of the course modules co-depend on the expertise and interests of the candidate. The candidate will also supervise graduation projects in the BSc and MSc programmes. The candidate should co-create an educational culture where Artificial Intelligence and Computational Cognitive Science students feel supported and where teachers foster personal growth in students. Importantly, the candidate is expected to add to a supportive and collaborative environment between colleagues.

8. Expected contributions to research

The candidate is expected to initiate and develop an internationally leading research programme in the field of Responsible & Explainable AI. The research should have visibility on the national and worldwide levels and lead to publications in top journals and conferences. Further it is expected that the new professor will take a leading role in the field of Artificial Intelligence within the Netherlands. Obtaining substantial external funding for PhD projects is crucial. Supervision of PhD students is an important part of the research activities. The research is expected to strengthen the existing efforts in the field of Artificial Intelligence within the Bernoulli Institute, and should lead to a strengthening of the international reputation of the group, the research center and the institute.

9. Expected contributions to the organisation

The candidate is expected to have an active interest and to provide a positive contribution to the management and organisational tasks of the institute. The candidate will furthermore contribute to the organisation of the faculty, for example by participating in working groups and committees, in the domains of education,

research and management. The candidate will contribute to relevant organisational activities on the national and international level.