Open positions in the Cluster of Excellence "Bilateral AI" at Graz University of Technology

Open research positions: 3 PhD positions, 1 PostDoc position

We are seeking highly motivated and talented individuals to join our dynamic research team for combining symbolic and sub-symbolic AI. The successful candidates will conduct research at the Graz University of Technology in collaboration with our partner institutes JKU, AAU Klagenfurt, ISTA, TU Graz, TU Vienna, and WU Vienna.

Job description:

The vision of Bilateral AI, is to educate a new generation of top-quality AI scientists with a holistic view on symbolic and sub-symbolic AI methods. The training will be distributed over the six participating Universities. Joint seminars, scientific workshops, and compulsory courses outside the PhD students' research fields, will be also be designed to encourage interdisciplinarity. Each student will be supervised by two experienced and internationally renowned professors with different research fields (symbolic / sub-symbolic AI). The training will also provide a career development program, advice and support for students with innovative business ideas, and workshops for presentation and soft skills.

Requirements:

- MSc degree in AI, Computer Science, Mathematics, Statistics or related fields
- background on Machine Learning or Automated Reasoning
- experience with programming in Python or C/C++
- strong written and verbal communication skills
- willingness and ability to work in a team

What we Offer:

- PhD: On the basis of full-time employment (40 hours/week)
- Opportunity to work together with leading experts in the field
  - Prof. Robert Legenstein
  - Prof. Elisabeth Lex
  - Prof. Wolfgang Maass
  - Prof. Robert Peharz
  - Prof. Thomas Pock
  - Prof. Franz Wotawa
- Opportunities for professional development and career advancement
- Stable employer
- Attractive campus environment with good public transportation connections
- State-of-the-art research infrastructure
- …and much more

Application Deadline:

Open until filled. Applications will be processed on a regular basis.
Only full application documents will be considered
Our project is committed to increase the proportion of academic female faculty and, for this reason, especially welcomes applications by qualified women. If applicants are equally qualified, a woman will be given preference for this position.

How to Apply:

If you are interested in a position, please submit regular application documents including

1. letter of motivation (detailing previous research achievements, research goals, career plans);
2. a complete CV, including a list of previous scientific expertise, awards, grants, stays abroad, attended lectures, attended summer schools, attended workshops, skills, and publications (if applicable);
3. abstract in English of the applicant's MSc thesis, BSc thesis or of a research project;
4. a complete list of completed studies and transcripts of all grades;
5. contact details of two reference persons (at least one academic) willing to provide a recommendation letter;
6. proof of proficiency in English (usually TOEFL/IELTS/CAE);

as described at the specific positions below.

PhD position with Prof. Franz Wotawa:

We are searching for students with good knowledge in either symbolic or sub-symbolic AI (e.g., machine learning). PhDs will be assigned to one of the following projects: (i) Quality assurance of AI-based systems, (ii) Explainable AI, or (iii) Combining ML and AI in diagnosis and debugging.

Duration: 4 years

Application: Submit the application documents, included in a .zip archive, to the **e-mail address** *wotawa@ist.tugraz.at* .

Post-Doc position with Prof. Franz Wotawa:

The open Post-Doc position is allocated to the sub-project Quality Assurance of AI-based Systems and shall contribute to research in verifying and validating software and systems comprising AI methodologies (either machine learning or symbolic AI). Candidates are expected to have already provided research in verification, validation, or testing and to have excellent knowledge of either logic or machine learning. Post-Docs will be involved in grant applications, conference organization, and the supervision of Bachelor and Master students, and teaching. Successful candidates will be assigned to the research group headed by Prof. Franz Wotawa.

Duration: 3 years

Application: Submit the application documents, included in a .zip archive, to the e-mail address *wotawa@ist.tugraz.at* .

PhD position with Prof. Robert Legenstein:

We are searching for students with excellent knowledge in machine learning as well as knowledge in computational neuroscience and spiking neural networks. The succesful candidate will work on brain-inspired learning architectures for broad AI systems.

Duration: 4 years

Application: Submit the application documents, included in a .zip archive, to the e-mail address robert.legenstein@igi.tugraz.at .

PhD position with Prof. Robert Peharz:

Tractable Causal Reasoning

The phrase "correlation is not causation" is a well-known aphorism, often accompanied by cautionary tales about confusing the two. Despite this, much of current machine learning relies heavily on function approximation, which captures "low-level" correlations but usually overlooks the true causal mechanisms underlying the data. Over the past few decades, causal modeling and reasoning have been built on solid formal foundations, and the importance of causality in machine learning is increasingly recognized.

While causal models are crucial for advancing broad AI, reasoning and inference within these models remain computationally challenging, primarily because causal reasoning is inherently based on probabilistic inference, which is notoriously hard. However, recent years have seen tremendous progress in tractable probabilistic models, which allow for inference to be performed exactly and efficiently.

In this project, we aim to break new ground by developing novel algorithms that enable tractable causal inference. Specifically, we seek to create innovative compilation and learning algorithms that convert causal and logic models into tractable probabilistic circuit representations, enabling causal inference in polynomial time. Exploring the computational (parameterized) complexity of causal inference is also of interest in this project.

The ideal candidate for this position should
* be curios, creative and a team player and have
* drive to develop their own research ideas and vision
* excellent mathematical and analytic skills
* excellent coding skills (particularly in Jax, PyTorch, TensorFlow, or Julia)
* excellent communication skills
* a deep interest in principled, theoretical approaches to AI, including probabilistic methods, causality, and logic

Duration: 4 years

Application: Submit the application documents to robert.peharz@tugraz.at , using the subject line "CoE PhD Application"

We offer an annual gross salary of at least € 50,103.20 for the fulltime PhD position and € 66,532.20 for the PostDoc position. An overpayment based on qualification and experience is possible.