



MAX-PLANCK-GESellschaft

PhD Position on Program Induction Methods for Discovering Decision Strategies (m/f)

The newly established [Max Planck Research Group for Rationality Enhancement](#), headed by Dr. Falk Lieder at the [Max Planck Institute for Intelligent Systems](#) in Tübingen, Germany, is looking for a PhD student (m/f) for a project at the intersection of machine learning and computational cognitive science.

Research questions

Our mission is to reverse-engineer and enhance human intelligence. You will be part of a larger project whose goals are to a) reverse-engineer the computational mechanisms enabling people to discover and continuously refine their highly efficient algorithms for planning, reasoning, and decision-making, b) develop automatic methods for discovering optimal heuristics and general principles of good decision-making, and to c) develop cognitive tutors that teach people optimal cognitive strategies. Your primary focus will be to develop and evaluate cognitively-inspired learning algorithms for discovering effective decision strategies. The goal is to develop robust program induction methods that can automatically discover interpretable decision strategies that people can use to make better choices. You will evaluate your methods by the performance and computational efficiency of the discovered algorithms, its robustness to misspecification. Finally, we will conduct training experiments to evaluate if teaching people the discovered strategies enables them to make better decisions.

The position

The PhD student (m/f) will receive a PhD funding contract equivalent in remuneration to pay group E13, 65% of the Collective Wage Agreement for the Public Service. An initial contract will be given for 3 years with possibility of 1-year extension. The successful PhD candidate (m/f) should have strong programming skills, and a solid background in computer science, cognitive science, or psychology, and previous experience with Bayesian machine learning and/or reinforcement learning methods. Experience with some of the following is a plus but not required: program induction, programming and running online experiments, cognitive modeling, research on human decision-making, probabilistic programming, and metareasoning. The starting date is flexible.

The Max Planck Institute for Intelligent Systems

The Max Planck Research Group for Rationality Enhancement is part of the MPI for Intelligent Systems in Tübingen, Germany (<http://is.tuebingen.mpg.de>). The

institute is a world-class center for foundational research in machine learning and related areas. The PhD position is also part of the brand new Tübingen AI Center and the Cyber Valley Initiative that is bringing new research groups, professorships, and industry partners to Tübingen and Stuttgart. The majority of the institute's scientific employees come from outside of Germany. You will work among gifted students and experienced scientists from all over the world; and have access to excellent infrastructure, including several regular series of tutorials, lectures, journal clubs and invited talks by international guests, as well as a large computer cluster, and dedicated full-time specialists. The working language at the institute is English.

Tübingen

[Tübingen](#) is a scenic medieval university town, cradled in what is simultaneously one of Germany's most beautiful landscapes one of Europe's most economically successful areas. Stuttgart airport is an hour by bus, Frankfurt airport can be reached in two hours by train. Most locals speak English and knowledge of German is not required to live here.

How to apply

Please submit a complete application to the Ph.D. program of the International Max Planck Research School for Intelligent Systems (www.imprs.is.mpg.de) by November 15. To express your interest for this specific project please list Dr. Falk Lieder as one of the faculty members you are interested in working with and mention the project in your motivational letter. Please start your application as early as possible so that you will have enough time to submit all of the required documents (see <https://imprs.is.mpg.de/application>) on time. If you have any questions about the project, our research group, or anything else, please do not hesitate to contact [Falk Lieder](#).

The Max Planck Society is committed to increasing the number of individuals with disabilities in its workforce and therefore encourages applications from such qualified individuals. The Max Planck Society seeks to increase the number of women in those areas where they are underrepresented and therefore explicitly encourages women to apply.

