



Several Ph.D. positions available

## Learning and Dynamical Systems

At the Learning and Dynamical Systems Group we perform fundamental research at the intersection between machine learning and dynamical systems to enable future cyber-physical systems that dynamically interact with their environment, seamlessly adapt to changes, and make sensible decisions. While rigorous theory and mathematical analysis forms the basis of our research, we also evaluate our methods in experiments on real-world systems. More information can be found here: <https://lds.is.mpg.de>.

We are continuously looking for outstanding students who are eager to do their Ph.D. on a challenging research project in a highly stimulating environment. We have a variety of possible projects available, covering theoretical and/or practical aspects of machine learning in connection to cyber-physical systems. These include:

- **Developing algorithms for large-scale constrained optimization**
- **Finding Nash equilibria in large-scale zero-sum games (training GANs)**
- **Developing a highly underactuated testbed**
- **Developing a testbed for studying if/how prior knowledge can improve learning**
- **Fundamental research in reinforcement learning**
- **Fundamental research in online learning/repeated decision-making**

Successful applicants have a Master's degree in engineering, computer science, or mathematics with excellent grades. Applicants should be fluent in written and oral English. Prior experience in dynamical systems and machine learning or experience with real-world testbeds is a plus.

### Max Planck Institute for Intelligent Systems

The Max Planck Institute for Intelligent Systems is part of the Max Planck Society, which is one of the world's most recognized and respected scientific research organizations. Max Planck directors have won 20 Nobel Prizes over the history of the Max Planck Society. In 2020, the Nature Index placed the Max Planck Institutes third worldwide in terms of research published in Nature journals. The Max Planck reputation gives you international recognition and exposure.

The Max Planck Institute for Intelligent Systems has a joint research center on learning systems with ETH Zurich and a joint research school with the University of Stuttgart and the University of Tübingen. Students who join the Max Planck Institute will typically enroll in one of these research schools. The Ph.D. degree will therefore be granted by either the University of Tübingen, the University of Stuttgart, or ETH Zurich.

### Contact

If you have any questions do not hesitate to contact us. When applying for a Ph.D. position, please include your CV, bachelor's and master's transcripts, a one-page letter of motivation describing your research interests and educational background, two reference letters, and two references that can be contacted.

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