



Deutscher Akademischer Austauschdienst
German Academic Exchange Service



Table of Contents

| | |
|---|----------|
| Doctorate | 2 |
| Continuous Verification of CYber-Physical Systems • Ludwig-Maximilians-Universität München • München | 2 |

Doctorate



Continuous Verification of CYber-Physical Systems

Ludwig-Maximilians-Universität München • München

Overview

| | |
|--|---|
| Degree | Dr rer nat (PhD of natural sciences) |
| Course location | München |
| In cooperation with | TU Munich |
| Teaching language | <ul style="list-style-type: none">English |
| Languages | All talks, research and supervision happens in an English-speaking environment. |
| Full-time / part-time | <ul style="list-style-type: none">full-time |
| Programme duration | 6 semesters |
| Beginning | Winter and summer semester |
| Tuition fees per semester in EUR | None |
| Combined Master's degree / PhD programme | No |
| Joint degree / double degree programme | No |
| Description/content | <p>Networks, computers, sensors, and actuators are increasingly integrated into cyber-physical systems; software systems that interact with the physical world and must cope with its continuous behaviour. An increasing number of cyber-physical systems operate in safety-critical domains. Examples are autonomous vehicles, robotic surgery, traffic control, human-robot collaboration, and smart grids. For this reason, their design and deployment should be accompanied by a formal check of correct behaviour.</p> <p>The Research Training Group on Continuous Verification of CYber-Physical Systems (ConVeY) conducts research in three areas:</p> <ul style="list-style-type: none">Robust System Design: We develop techniques to guarantee correct behaviour under changes in plant parameters, under certain classes of perturbations including sensor measurement errors, and under uncertainties introduced by the implementation platform. In particular, we investigate the design of controllers that are robust by construction against those changes.Evolving Systems: We investigate novel construction and verification techniques that |

adapt to offline changes in the specification, the hardware, or the implementation of control software, and reuse efforts from earlier stages as much as possible.

- **On-the-fly Synthesis and Verification:** We develop techniques for the online verification and synthesis of controllers that operate — and provide a correctness guarantee — only within a given time horizon. Repeated execution of this procedure, combined with availability of a fail-safe strategy, ensures safe operation.

Applicants should have very good skills in the English language and a strong background in at least one of the fields relevant for research at ConVeY: Control theory, formal methods in computer science, or machine learning. Experience is ideally shown through a thesis, seminar papers, or scientific publications. Alternatively, excellent grades in a respective Master's course.

Additional Support is offered by the [GraduateCenter](#).

Course Details

| | |
|---|---|
| Course organisation | <p>ConVeY is a research training group that funds PhD students with a full position for three years, with a potential extension. Depending on the research topic and the student's background, students may have to attend compensating course work.</p> <p>ConVeY is a joint research training group between TU Munich and LMU Munich. We offer a strong academic environment and a comprehensive qualification programme to our PhD students.</p> |
| International elements | <ul style="list-style-type: none">• International guest lecturers• Opportunities for students to work abroad |
| Integrated internships | ConVeY provides PhD students the possibility to perform research internships at other institutions. |
| Course-specific, integrated German language courses | No |
| Course-specific, integrated English language courses | No |

Costs / Funding

| | |
|--|--|
| Tuition fees per semester in EUR | None |
| Semester contribution | Basic fee 85 EUR + additional fee for the "Deutschlandticket" |
| Costs of living | Living costs (including accommodation and health insurance) in Munich range from 1,000 to 1,200 EUR per month. |
| Funding opportunities within the university | Yes |

Description of the above-mentioned funding opportunities within the university

ConVeY funds PhD students with a full position for three years, with a potential extension.

LMU Travel Grant, LMU Completion Grant

Requirements / Registration

Academic admission requirements

To apply for ConVeY, you should fulfil the following requirements:

- Excellent Master of Science in computer science, mathematics, or a related field
- Very good skills in the English language
- Strong background in at least one of the fields relevant for research at ConVeY:
 - Control theory
 - Formal methods in computer science
 - Machine learning
- Experience is ideally shown through a thesis, seminar papers, or scientific publications. Alternatively, excellent grades in a respective Master's programme.
- Strong intrinsic motivation with an interest in scientific collaboration.
- Mathematical skills are highly appreciated.

Language requirements

Very good skills in the English language (speech and written form) are required.

Submit application to

In case of interest, please contact us with your CV and a short description of your previous research experience at applications-convey@ifi.lmu.de.

Services

Accommodation

The International Office helps visiting academics, PhD students, and postdocs who are travelling to Munich for a set period of time to find accommodation.

For further information, please visit the following link:

<https://www.lmu.de/en/study/important-contacts/international-office/index.html>.

Rooms in shared flats are popular on the private market and reasonably priced at 400-600 EUR per month if located in central parts of Munich.

Structured research and supervision

Yes

Research training / discussion

Yes

Support for international students and doctoral candidates

- Welcome event
- Buddy programme
- Specialist counselling
- Support with registration procedures

General services and support

ConVeY provides an international environment shared between LMU Munich and TU Munich.

**for international students
and doctoral candidates**

Every new PhD student is assigned a senior PhD student as her/his buddy, to help with onboarding, initial questions, and group events. Weekly meetings and talks lead to a strong collaboration between the members of the research group.

In addition, every PhD student is assigned a thesis advisory board that consists of two senior researchers.

Supervisor-student ratio

Two supervisors for each student

Contact

Ludwig-Maximilians-Universität München

Faculty of Mathematics, Computer Science, and Statistics

Prof Dr Dirk Beyer

Oettingenstr. 67
80538 München

Tel. +49 8921809151

✉ applications-convey@ifi.lmu.de

🌐 Course website: <https://convey.ifi.lmu.de/>

📘 <https://de-de.facebook.com/lmu.muenchen/>

Last update 15.01.2025 09:56:43

International Programmes in Germany - Database

www.daad.de/international-programmes
www.daad.de/sommerkurse

Editor

DAAD - Deutscher Akademischer Austauschdienst e.V.
German Academic Exchange Service
Section K23 – Information on Studying in Germany
Kennedyallee 50
D-53175 Bonn
www.daad.de

GATE-Germany

Consortium for International Higher Education Marketing
www.gate-germany.de

Disclaimer

The data used for this database was collected and analysed in good faith and with due diligence. The DAAD and the Content5 AG accept no liability for the correctness of the data contained in the "International Programmes in Germany" and "Language and Short Courses in Germany".

The publication is funded by the German Federal Ministry of Education and Research and by contributions of the participating German institutions of higher education.



Federal Ministry
of Education
and Research