

## MUNICH AEROSPACE – NEW HORIZONS IN AVIATION AND SPACE

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In 2010, through Munich Aerospace and its pooling of research, graduate programmes and teaching an alliance has been formed between the **Technical University Munich (TUM)**, the **Bundeswehr University Munich (UniBwM)**, the **German Aerospace Center (DLR)**, as well as **Bauhaus Luftfahrt (BHL)**.

To promote excellent, scientific young academics, Munich Aerospace awards a PhD scholarship on

### Robust Model Predictive Control under Uncertainties

The Institute of Flight System Dynamics at the Technical University of Munich works on various fields of research. This vacant position is mainly connected to the trajectory optimization group and besides requires skills in the field of real-time optimization and stochastics. The scholarship is part of the Munich Aerospace Research Group **“Robust and efficient real-time flight path optimization”** where real-time trajectory optimization shall be achieved by model predictive control with sensitivity updates and structure exploiting optimal control methods for the development of fast and efficient algorithms.

#### Your tasks

- Development of simulation models of lift to cruise transition UAVs with extensible physical detail
- Uncertainty quantification and inclusion of uncertainties into simulation models
- Real-time calculation of feasible and robust trajectories by nonlinear model predictive control
- Extension of real-time algorithm for stochastic optimal control problems
- Validation in flight tests

#### Your profile

- Excellent Master’s degree in an engineering discipline or equivalent
- Good and efficient programming skills (C/C++, MATLAB, Simulink)
- Good background in applied optimal control or optimization (experience with FALCON.m beneficial)
- High motivation, autonomous working style and the ability to work in an international team
- Excellent English or German skills (German beneficial)
- Completion of university degree not more than three years prior to the application for the scholarship

The Institute of Flight System Dynamics offers the possibility for further scientific and applied qualification, while working on current and relevant research topics. Within the research group, you will become a member of a highly motivated, international, and autonomous team that will support you during your personal and scientific development. You will be working highly autonomously.

## The Scholarship

The Munich Aerospace scholarship amount is 1.575 € per month granted for a minimum of 12 months and limited to a maximum of 3 years. Munich Aerospace scholarship holders are entitled to attend the Munich Aerospace Graduate School, formed by the TUM Graduate School and the DLR\_Graduate\_Program, and have access to special events and trainings. An additional grant of up to € 6.100 per year will be available to cover expenses that are directly related to the PhD project (e.g. textbooks, laptop, conference travels, public transport, housing subsidy). The scholarship holder is part of a Munich Aerospace research group and receives additional technical support from the research group head. The candidates receive their PHD from TUM or UniBwM.

TUM seeks to increase the number of women in areas in which they are underrepresented. Therefore, we particularly encourage qualified women to apply. TUM further aims to hire more people with disabilities and also encourages them to apply for research positions.

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## Interested?

Please send us your application (cover letter, CV, diplomas, transcript of records) in PDF format to [application@fsd.lrg.tum.de](mailto:application@fsd.lrg.tum.de) with the subject "Application Munich Aerospace MPC". The application deadline is April 14, 2021.

If you have any questions, please contact Tuğba Akman ([tugba.akman@tum.de](mailto:tugba.akman@tum.de)).

**We are looking forward to your application!**