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IVI

COMBINING STUDY AND RESEARCH IS NOT POSSIBLE.

# YES.

Join Fraunhofer IVI in Ingolstadt.

YOU WANT TO SHAPE URBAN AIR MOBILITY TOGETHER WITH US AND YOU ARE INTERESTED IN PROGRAMMING? WE AT FRAUNHOFER IVI ARE LOOKING FOR A

## BACHELOR OR MASTER THESIS ON **MACHINE LEARNING IN THE FIELD OF AUTONOMOUS FLYING** IN INGOLSTADT

The Fraunhofer **Application Center "Connected Mobility and Infrastructure"** at Technische Hochschule Ingolstadt (THI) focuses on current and future topics of automated and cooperative driving. Diverse competences in the fields of sensor technology, communication and artificial intelligence are combined, fostering synergies with the local industry, and aiming for close cooperation with the city of Ingolstadt and its partners. With research on urban air mobility, the application center is opening further fields of technology in the areas of autonomous systems, digitization in traffic, highly automated flying, as well as vehicle and traffic safety.

Our research team specializes in using machine learning and computer vision to transform the field of highly automated flying systems. We provide a stimulating environment, as well as access to modern facilities. We are searching for a highly motivated master's/bachelor's student to join our team and conduct significant research in one or more of the areas listed below:

- **adversarial feature / data augmentation:** Using adversarial augmentations to improve the generalization, resilience, and adaptability of machine learning models
- **multi-task learning:** Developing a common backbone/feature extractor design that can accomplish numerous tasks at once, such as object detection, scene parsing, depth estimation for autonomous flying
- **transfer learning / knowledge distillation:** Investigating strategies for enhancing model efficiency by transferring the knowledge gained from large models to smaller models that can be deployed under real-world constraints
- **panoptic segmentation:** Fine tuning models for 2D / 3D panoptic segmentation based on camera images / point cloud for autonomous flying

**Your tasks:**

- conduct literature study to identify research gaps and possibilities in the chosen research topic(s)
- design and implement algorithms, conduct tests, and gather data
- validate and refine research with team members and external partners

**Your profile:**

- enrolled in a Master's or Bachelor's program in computer science, electrical engineering, physics, computer science, mathematics, mechanical engineering or related fields
- prior research experience or coursework in machine learning, computer vision or robotics highly desirable
- proficiency in programming languages such as Python and experience with deep learning frameworks (e. g., PyTorch)
- passion for research and problem-solving
- excellent communication skills and ability to work collaboratively in a team

**What you can expect:**

- opportunity to work in the field of machine learning and neural networks
- access to state-of-the-art computational resources and modern infrastructure
- valuable research experience and exposure to real-world practical projects
- flexible working hours.
- potential for co-authorship on research papers and conference presentations

Fraunhofer is Europe's largest application-oriented research organization. Our research efforts are geared entirely to people's needs: health, security, communication, energy and the environment. We are creative. We shape technology. We design products. We improve methods and techniques. We open up new vistas.

At its three locations Dresden, Ingolstadt and Berlin, Fraunhofer IVI's researchers develop technologies and concepts in the fields of mobility, energy and security from forward-looking research to practical application. The institute cooperates closely with TU Dresden, TU Bergakademie Freiberg and TH Ingolstadt.

**Please register at the career portal of the Fraunhofer-Gesellschaft and send us your meaningful application:**

**Career Portal**

**If you have any questions, please contact:**

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