Master's/Bachelor's Thesis – Predictive Process Monitoring (PPM) with Graph Neural Networks (GNNs)

The Fraunhofer-Gesellschaft (www.fraunhofer.com) currently operates 76 institutes and research institutions throughout Germany and is the world's leading applied research organization. Around 32 000 employees work with an annual research budget of 3.4 billion euros.

The »**Process Intelligence**« group of the Fraunhofer IIS analyzes, designs, and optimizes data-driven processes and supports companies with process-related key figures and recommendations for action in decisions related to transport, production, logistics, and health. For this purpose, we use qualitative and quantitative analysis and forecasting methods from the field of Machine Learning. Our group is part of the Analytics department, which researches in the areas of Analytics, Artificial Intelligence, and mathematical optimization in the context of digitalizing supply and value chains.

You are interested in combining research and practices and would like to develop further in the field of Machine Learning and Process Mining?
Then have a look at our offer!

What you will do
- You research the latest methods in the areas of Process Mining, Predictive Process Monitoring, and Graph Learning
- You investigate and implement various Graph Neural Networks for Predictive Process Monitoring use cases
- You compare, interpret, and evaluate the achieved results with each other and with traditional approaches
- You prepare your findings in engaging presentations for the team
- You expand our existing software inventory with selected approaches

What you bring to the table
- You are currently studying Computer Science, Mathematics, Data Science or a related field
- You have experience in Python (especially ML frameworks like PyTorch, sklearn, etc.)
- You are interested in Machine Learning (especially Graph Learning) and want to apply this interest to challenging tasks
- You show initiative and an independent way of working
- You have excellent English skills (German skills are a bonus)
- Advantageous: You have worked with PyTorch Geometric before and have a basic understanding of Process Mining

What you can expect
- **Flexible** working hours
- **Open** and **friendly team work**
- **Varied** tasks with room for **creativity**
- Exciting **seminars** and **events**
- **Networking** with scientists
- **Active contribution** in applied research
- **Interesting** and **innovative** projects
- **Mentoring program** »josephine®« for talented female students

We are pleased to offer you the opportunity to write a Bachelor's or Master's thesis in collaboration with us on the abovementioned topic. The awarding and execution of the thesis will follow the rules of the university where you are enrolled. Please consult with a professor of your choice for the supervision of your thesis. If you are studying at the Nuremberg University of Applied Sciences, the Friedrich-Alexander University Erlangen-Nuremberg, or the Ludwig Maximilian University of Munich, we can gladly arrange suitable supervision together. After your studies, you have the option of working with us full or part-time.

We value and promote the diversity of our employees' skills and therefore welcome all applications - regardless of age, gender, nationality, ethnic and social origin, religion, ideology, disability, sexual orientation and identity.

Interested?
Apply online now (PDF: cover letter, CV, transcripts). We look forward to getting to know you!

Contact person: Attila Lischka
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Fraunhofer-Institute for Integrated Circuits IIS
www.iis.fraunhofer.de/en

Requisition Number: xxxxx   Application Deadline: none   Location: Nuremberg