

HANNES STÄRK

MIT PhD Student in Electrical Engineering and Computer Science

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EDUCATION


PhD in EECS | Machine Learning

Massachusetts Institute of Technology  June 2022 - June 2027

- Advised by Prof. [Tommi Jaakkola](#) and Prof. [Regina Barzilay](#)
- Working on ML for biochemistry and generative models.


M.Sc. Informatics | Machine Learning major

Technical University of Munich  Oct 2019 - Sept 2021

- "passed with high distinction" (1.2) - No corrections for [thesis](#)
 - Thesis at University of Cambridge with Pietro Liò and Stephan Günnemann.
 - Learning theory, ML, DL, Quantum Computing, Protein Prediction, ...
-  Attending theoretical foundations of AI and protein prediction reading groups

B.Sc. Informatics | Mathematics track

Bundeswehr University Munich  Oct 2017 - Sept 2019

- Only student who completed the 3 year curriculum in 2 years
-  Built concept and started development of the app [CoachPTBS](#)

EXTRACURRICULAR TRAINING

Machine Learning Summer School: [MLSS](#)  Aug 2021

- Strong student award and nominated for best paper (selective admission)

Eastern European ML Summer School: [EEML](#)  Jul 2021

- 1 of 4 chosen students to present research (selective admission)

SELECTED PAPERS (find all here:)

- Stärk et al. (2023) "[Harmonic Self-Conditioned Flow Matching for Multi-Ligand Docking and Binding Site Design](#)". In: *Under Review*. Oral at [NeurIPS'23 AI4Science workshop](#).
- Gabriele Corso*, Hannes Stärk* et al. (2023) "[DiffDock: Diffusion Steps, Twists, and Turns for Molecular Docking](#)". In: *ICLR 2023*. Best paper at [NeurIPS'22 Score-Based Methods Workshop](#)
- Stärk et al. (2022) "[EquiBind: Geometric Deep Learning for Drug Binding Structure Prediction](#)". In: *ICML 2022*. Also spotlight at [ICLR'22 MLDD](#).
- Stärk et al. (2022) "[3D Infomax improves GNNs for Molecular Property Prediction](#)". In: *ICML 2022*. Also at [NeurIPS 2021 ML4PH](#), [AI4S](#), [SSL workshops](#) and [ELLIS ML4Molecules workshop](#).
- Stärk et al. (2021) "[Light Attention Predicts Protein Location from the Language of Life](#)". In: *OUP Bioinformatics Advances*. Spotlight at [ICLR'21 MLPCP](#). Poster + talks at [MLCSB 2021](#) and [WCB ICML 2021](#).

WORK EXPERIENCE

ML Research Intern

Valence Discovery

 March 2022 - May 2022  remote  Part-time

 Graph ML for drug-target binding affinity prediction

Mathematics Instructor

BIB Augsburg gGmbH

 Feb 2020 - Nov 2021  Augsburg, DE  Part-time

 4h per week: teaching linear algebra, analysis, and statistics


- Online lectures and weekly individual lessons

SUMMARY

*I am a second-year PhD student at MIT CSAIL advised by Tommi Jaakkola and Regina Barzilay. I work on ML for **bio-chemistry problems and diffusion/flow based generative models**. I aim to use ML for modeling complex systems with the purpose of improving our understanding of the world and helping tackle impactful real-world problems.*

NEWS

MIT News featured [DiffDock](#)  Mar 2023

MIT News featured [EquiBind](#)  Jul 2022

ACADEMIC OUTREACH

My Reading Group: LoGG

 since Aug 2021  virtual

- I organize the weekly [Learning on Graphs and Geometry reading group](#) where I discuss papers with authors on Zoom with ~ 75 weekly attendees.
- Slack community of over 2,700 researchers
- Sponsored by [Recursion Valence Labs](#)

Co-founder and Organizer of the [Learning on Graphs Conference](#)

 since Dec 2022  virtual

- Innovate reviewing process with financial incentives for reviewers and quality control
- Decentralized meetups, free registration, and fully openly accessible

Main organizer of [MoML Conference](#)

 since Oct 2023  MIT, Cambridge, MA

- 300 attendee, Molecular ML conference, in honor of my deceased mentor [Octavian Ganea](#).

REVIEWING

- 5 NeurIPS 2023 Workshops (11 papers)
- NeurIPS 2023 (6 papers)
- ICML 2023 Frontiers in Learning, Control, and Dynamical Systems Workshop (3 papers)
- ICML 2023 Synergy of Scientific and Machine Learning Modelling Workshop (1 paper)
- IEEE Transactions on Pattern Analysis and Machine Intelligence (1 paper)
- Bioinformatics (1 paper)
- 2021 Machine Learning for Health Symposium (4 papers)

Student Assistant

Institute of Mathematics and OR, Bundeswehr University Munich

📅 Sept 2018 – July 2019 📍 Munich, DE 🛒 Part-time

🔑 10h workweek: causal inference + structure learning in Bayesian networks

- Implemented and evaluated methods for regression on time-series data

Dual Study Program

Allianz Deutschland AG

📅 Sept 2017 – Sept 2019 📍 Munich, DE 🛒 Part-time

🔑 38h workweek: web-development and digital infrastructure maintenance in an agile development team, technical training in computer science

- Designed and Developed an app for organizing large software releases
- Provided web-applications for customer interaction and deployment pipelines

📋 Java (Spring Boot), HTML, CSS, TypeScript (Angular), Git, Jenkins, software engineering best practices, clean and fast programming

TEACHING

Operations Research

Technical University of Munich, Decision Sciences

📅 April 2021 – Sept 2021 📍 Remote 🛒 Part-time

- Taught two recitations per week for 40 students, helped in online forum

Deep Learning

Technical University of Munich, CV & AI Niessnerlab

📅 Nov 2020 – April 2021 📍 Remote 🛒 Part-time

- Held weekly office hours, created exercises and learning material like jupyter notebooks, answered questions in an online forum

VOLUNTEERING

Co-organizer of ML on Graphs Workshop @ WSDM 2022

ICLR 2021 and ICML 2021 Volunteer

- Help presenters and host talks including keynotes

Gymnastics and Acrobatics Trainer

VfL Buchloe

📅 Sept 2015 – May 2022 📍 Buchloe, DE

- Started acrobatics show group [Akrobatik Astral](#)
- Training gymnastics and acrobatics groups for competitions and shows
- Choreograph acrobatics [shows](#) 📺 and participate in them

SKILLS

Python

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Main language in projects and personal use

Java + Scala

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Two years of backend development and main language during studies

Other Languages: HTML, CSS, JavaScript (proficient) R, C++, SQL, ARM assembly, Swift, MATLAB (used occasionally)

PyTorch

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Self-Supervised learning, Transformers for proteins, Differentiable rendering, Reinforcement learning, WaveNet for denoising audio, Enzyme prediction + projects done as coursework and exercises created for courses

TensorFlow, Keras

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Variational Autoencoder for aerial images

Other: Spectral Methods for Graphs, Computer Vision, Git, Unix systems, Shell, Docker, Cloud-foundry, Jenkins, Unittesting, Jupyter, \LaTeX , clean code, AWS, Google Cloud Platform

Languages:

German

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Native Speaker

English

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Professional Proficiency | 96% in TOEFL test

French

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Secondary language at school and from friends

LEISURE

Gymnastics, Philosophy, Acrobatics, Watching online lectures, Chess ♚, Paper discussions

AWARDS

🏆 Lightning award at MLSS

🏆 Strong student award at MLSS

🏆 Highest prize money award at WCB ICML'21

TALKS (find all here: 🌐)

[American Chemical Society](#) 📅 Aug 2023

Invited talk at Skolnik Award Symposium

[Mila - Quebec AI Institute](#) 📅 Jan 2022

Molecular Modelling. Host: Dr. Prudencio Tossou

[Twitter Research](#) 📅 Jan 2022

Host: Prof. Michael Bronstein and Fabrizio Frasca

[Technical University of Munich](#) 📅 Nov 2021

Two guest lectures about protein prediction for biology and CS students. Host: Prof. Burkhard Rost

[University of Cambridge](#) 📅 Oct 2021

AI Research seminar. Host: Prof. Mateja Jamnik

[Valence Discovery](#) 📅 Oct 2021

Invited talk. Host: Daniel Cohen

[ISMB/ECCB 2021](#) 📅 July 2021

Chosen for "Long Talk" on representation learning