MANUEL BRACK

Research Scientist

📞 408-581-1691 @ mail@manuel-brack.eu in manuel-brack-17b07718b
% manuel-brack.eu 📍 Darmstadt, Germany

I am a highly motivated Research Scientist with a proven track record in pioneering large-scale generative models at the intersection of natural language processing and computer vision. I have authored numerous top-tier publications and spearheaded significant contributions to open-source AI projects. My expertise includes utilizing super-compute clusters to enhance large-scale data collection, curation, and distributed model training, consistently driving cutting-edge innovations. I am passionate about advancing AI technologies and am eager to bring my skills to a forward-thinking organization where I can lead transformative research initiatives.

EDUCATION

PhD (Dr. rer. nat.) - Artificial Intelligence	M.Sc. - Computer Science	B.Sc. - Computer Science
TU Darmstadt, AI&ML lab	**TU Darmstadt, 1.0 GPA (with honors)**	**TU Darmstadt, 1.5 GPA**
Advisor: Kristian Kersting	**Advisors: Patrick Schramowksi & Kristian Kersting**	**Advisors: Nikolaous Alexopolous & Max Mühlhäuser**
12/2024	**07/2022**	**04/2020**
Multiple publications at top ML conferences	*Master Thesis published at ICML*	*Bachelor Thesis published at Usenix Security*

INDUSTRY & RESEARCH EXPERIENCE

Research Scientist Intern
📅 2024
Adobe Applied Research
📍 San Jose, CA

- Conducted an original research project on improving text-to-image pretraining, potentially leading to improved model performance despite vastly reduced data requirements

Research Scientist
📅 2023 - now
German Research Center for AI (DFKI)
📍 Darmstadt, Germany

- Conducted fundamental research on Generative AI through continued collaboration with other institutes resulting in publications at top ML venues.
- Lead the cooperation with hessian.AI on the Occiglot effort, for which I implemented and oversaw large-scale data curation and LLM training on the 42 supercomputer. This collaboration resulted in the open-source release of over ten cutting-edge LLMs and multilingual pre-training datasets
- Served as liaison and participated in a national effort for LLM development
- Made several contributions to the *diffusers* open-source library, implementing 3 impactful pipelines from my research that are now natively supported by *diffusers*

Research Scientist Intern
📅 2023
Adobe Research
📍 San Jose, CA

- Carried out a research project on image editing with diffusion models that I successfully published at CVPR 2024

Scientific Employee
📅 2022 - now
Artificial Intelligence & Machine Learning Lab @ TU Darmstadt
📍 Darmstadt, Germany

- Conducted cutting-edge research on Generative AI and co-authored over 10 original research papers that were published at top venues (NeurIPS, CVPR, ICML, JAIR, etc.)
- Contributed to teaching at TU Darmstadt through guest lectures and talks in the *Continual Machine Learning* and *Deep Learning* courses
- Supervised five Master students whose efforts contributed to multiple original research works

Software Engineer
📅 2020 - 2022
Argo Cloud Solutions GmbH
📍 Offenbach, Germany

- Designed and implemented a heuristic natural language processing pipeline to automate data entry for real estate applications
- Led the implementation of a cloud pipeline to automatically track over 10000 weekly mails in custom CRM system saving hundreds of working hours per month

OTHER EXPERIENCE & TEACHING

Co-Founder & Lead Researcher

📅 2024 - now

📍 Europe

Occiglot Research Collective

- Co-founded the Occiglot research collective to advance academic, open-source LLM development for European languages
- Released more than ten multilingual LLMs to the public. I led the training implementation and execution on the 42 super-cluster
- Made major contributions to multilingual open-source datasets through web-scale data crawling and implementing new filtering and deduplication pipelines
- Build a pan-European community of LLM researchers with 100s of active members

Guest Lecturer

📅 2024

📍 Darmstadt, Germany

Continual Machine Learning – TU Darmstadt

Teaching Assistant

📅 2021

📍 Darmstadt, Germany

Natural Language Processing and the Web – TU Darmstadt

SELECTED PUBLICATIONS   🔹 **Google Scholar**

Björn Deiseroth, **Manuel Brack**, Patrick Schramowski, Kristian Kersting, Samuel Weinbach (2024): **T-FREE: Tokenizer-Free Generative LLMs via Sparse Representations for Memory-Efficient Embeddings.** *Under Review.* arXiv:2406.19223

Manuel Brack*, Felix Friedrich*, Katharina Kornmeier*, Linoy Tsaban, Patrick Schramowski, Kristian Kersting, Apolinaros Passos (2024): **LEDITS++: Limitless Image Editing using Text-to-Image Models.** *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR).* arXiv:2311.16711

Felix Friedrich, **Manuel Brack**, Dominik Hintersdorf, Lukas Struppek, Patrick Schramowski, Sasha Luccioni, Kristian Kersting (2024): **Auditing and Instructing Text-to-Image Generation Models on Fairness.** *AI and Ethics.* arXiv:2302.10893

Manuel Brack, Felix Friedrich, Dominik Hintersdorf, Lukas Struppek, Patrick Schramowski, Kristian Kersting (2023): **SEGA: Instructing Text-to-Image Models using Semantic Guidance.** *In Proceedings of the Conference on Neural Information Processing Systems (NeurIPS).* arXiv:2301.12247

Marco Bellagente*, **Manuel Brack***, Hannah Teufel*, Felix Friedrich, Björn Deiseroth, Constantin Eichenberg, Andrew Dai, Robert Baldock, Souradeep Nanda, Koen Oostermeijer, Andres Felipe Cruz-Salinas, Patrick Schramowski, Kristian Kersting, Samuel Weinbach (2023): **MultiFusion: Fusing Pre-Trained Models for Multi-Lingual, Multi-Modal Image Generation.** *In Proceedings of the 37th Conference on Neural Information Processing Systems (NeurIPS).* arXiv:2305.15296

Manuel Brack*, Patrick Schramowski*, Björn Deiseroth, Kristian Kersting (2023): **ILLUME: Rationalizing Vision-Language Models through Human Interactions.** *In Proceedings of the International Conference on Machine Learning (ICML).* arXiv:2208:08241

Patrick Schramowski*, **Manuel Brack***, Björn Deiseroth, Kristian Kersting (2023): **Safe Latent Diffusion: Mitigating Inappropriate Degeneration in Diffusion Models.** *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR).* arXiv:2211.05105

SELECTED WORKSHOP PAPERS   🔹 **Google Scholar**

Lukas Helff*, Felix Friedrich*, **Manuel Brack***, Patrick Schramowski, Kristian Kersting (2024): **LLAVAGUARD: VLM-based Safeguard for Vision Dataset Curation and Safety Assessment.** *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops,* arxiv:2406.05113

Manuel Brack*, Felix Friedrich, Patrick Schramowski, Kristian Kersting (2023): **Mitigating Inappropriateness in Image Generation: Can there be Value in Reflecting the World's Ugliness?.** *In Workshop on Challenges of Deploying Generative AI at ICML.* arXiv:2305.18398

* Denotes equal contribution