

Maximilian Beck

AI Research Scientist at Meta FAIR. Research on efficient Large Language Model architectures.

Nationality German Languages German (native), English (fluent)  Paris, France

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Experience

AI Research Scientist

Meta FAIR

 April 2026 – ongoing  Paris, France

- Research on efficient LLM architectures

Research Scientist Intern

Meta FAIR, CodeGen Team

 May 2025 – Oct 2025  Paris, France

- Research on LLMs for code and [neural debuggers](#); hosted by [Jonas Gehring](#), [Jannik Kossen](#), Gab Synnaeve
- Co-authored [two](#) more research [papers](#)

PhD Researcher

NXAI GmbH

 Aug 2024 – Mar 2026  Linz, Austria

- Research on scaling [xLSTM](#) as Transformer alternative
- Developed [custom Triton](#) and CUDA Kernels for xLSTM
- Exploration of [scaling laws](#) for recurrent LLMs

Student Researcher

FZI Research Center for Information Technology

 Nov 2019 – Jul 2021  Karlsruhe, Germany

- Research on autonomous driving and motion planning under uncertainty
- Software development for the internal driving simulator; contributed a package for visibility calculations with CGAL written in C++ and Python ([github repo](#))

Student Research Assistant

wbk Institute for Production Science, KIT

 Nov 2016 – Jun 2018  Karlsruhe, Germany

Skills

- **Programming Languages:** Python (2018-present), C/C++ (2016-2025), Java (2011-2016)
- **Other skills:** PyTorch (2021-present), JAX (2024-present), CUDA (2023-present), Triton (2024-present), slurm (2021-present), git (2015-present)

Education

PhD, Artificial Intelligence

Johannes Kepler University

 Jul 2021 – Mar 2026  Linz, Austria

- PhD Advisor: Dr. Sepp Hochreiter
- Thesis: [xLSTM: Recurrent Neural Network Architectures for Scalable and Efficient Large Language Models](#)

Master of Science,

Mechatronics and Information Technology

Karlsruhe Institute of Technology - KIT

 Oct 2017 – April 2021  Karlsruhe, Germany

- Focus: Control Technology in Mechatronics
- Master Thesis at [Institute of Measurement and Control Systems \(MRT\)](#) & [FZI: Motion Planning for Automated Vehicles in Uncertain Environments](#) ([pdf](#)); advised by [Ömer Şahin Taş](#)
- Final Grade: 1.4 (German grading system)

Exchange Program, Computer Engineering

San José State University

 Aug 2018 – May 2019  San José, California, USA

- 2 semester exchange program. GPA: 3.8/4.0

Bachelor of Science,

Mechatronics and Information Technology

Karlsruhe Institute of Technology - KIT

 Oct 2014 – Oct 2017  Karlsruhe, Germany

- Bachelor Thesis at [wbk Institute for Production Science](#): *Machine Control and Industry 4.0 Functions for a Machining Center of Type DMC 60H*
- Final Grade: 1.5 (German grading system)

Selected Publications (Google Scholar)

- [Maximilian Beck](#), Jonas Gehring, Jannik Kossen, Gabriel Synnaeve: **Towards a Neural Debugger for Python**. Arxiv, 2026. ([link](#))
- [Maximilian Beck](#), Kajetan Schweighofer, Sebastian Böck, Sebastian Lehner, Sepp Hochreiter: **xLSTM Scaling Laws: Competitive Performance with Linear Time-Complexity**. Arxiv, 2025. ([link](#))
- [Maximilian Beck](#), Korbinian Pöppel, Phillip Lippe, Sepp Hochreiter: **Tiled Flash Linear Attention: More Efficient Linear RNN and xLSTM Kernels**. Advances in Neural Information Processing Systems (NeurIPS), 2025. ([link](#))
- [Maximilian Beck*](#), Korbinian Pöppel*, Phillip Lippe*, Richard Kurlle, Patrick M. Blies, Günter Klambauer, Sebastian Böck, Sepp Hochreiter: **xLSTM 7B: A Recurrent LLM for Fast and Efficient Inference**. International Conference on Machine Learning (ICML), 2025. ([link](#))
- [Maximilian Beck*](#), Korbinian Pöppel*, Markus Spanring, Andreas Auer, Oleksandra Prudnikova, Michael Kopp, Günter Klambauer, Johannes Brandstetter, Sepp Hochreiter: **xLSTM: Extended Long Short-Term Memory**. Advances in Neural Information Processing Systems (NeurIPS), 2024. ([link](#)) [[Spotlight](#)]
- Korbinian Pöppel, [Maximilian Beck](#), Sepp Hochreiter: **FlashRNN: Optimizing Traditional RNNs on Modern Hardware**. International Conference on Learning Representations (ICLR), 2025. ([link](#))
 - *Own contributions*: Contributed the FlashRNN sLSTM & LSTM Triton Kernels. Set up speed experiments. Contributed to writing.
- Benedikt Alkin, [Maximilian Beck](#), Korbinian Pöppel, Sepp Hochreiter, Johannes Brandstetter: **Vision-LSTM: xLSTM as Generic Vision Backbone**. International Conference on Learning Representations (ICLR), 2025. ([link](#))
 - *Own contributions*: Provided the mLSTM implementation.
- Thomas Schmied, Thomas Adler, Vihang Patil, [Maximilian Beck](#), Korbinian Pöppel, Johannes Brandstetter, Günter Klambauer, Razvan Pascanu, Sepp Hochreiter: **A Large Recurrent Action Model: xLSTM enables Fast Inference for Robotics Tasks**. International Conference on Machine Learning (ICML), 2025. ([link](#))
 - *Own contributions*: Contributed fast Triton inference kernels.
- Marius-Constantin Dinu, Markus Holzleitner, [Maximilian Beck](#), Hoan Duc Nguyen, Andrea Huber, Hamid Eghbal-zadeh, Bernhard A. Moser, Sergei Pereverzyev, Sepp Hochreiter, Werner Zellinger: **Addressing Parameter Choice Issues in Unsupervised Domain Adaptation by Aggregation**. International Conference on Learning Representations (ICLR), 2023. ([link](#)) [[Oral](#)]
 - *Own contributions*: Implementation of our method IWA & baselines. Design of experiments and presentation of empirical results ([see here](#)). Contributed to writing.
- Martin Gauch, [Maximilian Beck](#), Thomas Adler, Dmytro Kotsur, Stefan Fiel, Hamid Eghbal-zadeh, Johannes Brandstetter, Johannes Kofler, Markus Holzleitner, Werner Zellinger, Daniel Klotz, Sepp Hochreiter, Sebastian Lehner: **Few-Shot Learning by Dimensionality Reduction in Gradient Space**. Conference on Lifelong Learning Agents (CoLLAs), 2022. ([link](#)) [[Oral](#)]
 - *Own contributions*: Experiments and baseline implementations ([see here](#)). Made an animation for our method ([see here](#)). Contributed to writing.

* denotes equal contribution

I have served as a reviewer for the following conferences: NeurIPS-2024, ICLR-2025, ICML-2025, NeurIPS-2025, ICLR-2026, ICML-2026.

Invited Talks

- May 2026 (Virtual): Invited Talk **Towards a Neural Debugger for Python** at KTH Royal Institute of Technology in Sweden in [Martin Monperrus' research group](#)
- Mar 2026 (Linz, Austria): PhD Defense **xLSTM: Recurrent Neural Network Architectures for Scalable and Efficient Large Language Models** at [JKU Linz](#)
- Apr 2025 (London, UK): Invited Talk **xLSTM: New Architectures for Large Language Models** at [G-Research](#)
- Apr 2025 (Virtual): Presented **xLSTM 7B: A Recurrent LLM for Fast and Efficient Inference** online on [ploutos.dev](#)
- **xLSTM: Extended Long Short-Term Memory**
 - Jan 2025 (Virtual): Guest Lecture [FAU Erlangen-Nuremberg](#) in the *Machine Learning for Time Series* course
 - Nov 2024 (Munich, Germany): Opening Keynote at [Machine Learning Week Europe](#)
 - Sep 2024 (Virtual): [Meta](#), Monetization AI Speaker Series
 - Sep 2024 (Karlsruhe, Germany): KIT, [Autonomous Learning Robots \(ALR\) Lab](#)
 - Aug 2024 (Vienna, Austria): ELLIS Seminar at [Institute of Science and Technology Austria \(ISTA\)](#)
 - Aug 2024 (Virtual): [Google Research](#) NLP Seminar
 - Jul 2024 (Vienna, Austria): Oral at [ES-FoMo@ICML24](#)
 - Jul 2024 (YouTube): [1littlecoder's](#) youtube channel ([Recording](#))
 - Jun 2024 (Helsinki, Finland): ELLIS PhD Spotlight Presentation at [ELISE Wrap Up Conference 2024](#)
 - Jun 2024 (Virtual): [Intel Labs](#)
- **Few-Shot Learning by Dimensionality Reduction in Gradient Space**
 - Oct 2022 (Virtual): [Ruhr-University Bochum, Chair for Machine Learning](#)

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