

Manpa Barman

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EDUCATION

- **Universität Stuttgart** Stuttgart, DE
 - *M.Sc. in Information Technology; Overall Grade: 1.6 / Thesis Grade: 1.0* *Oct. 2022 – May 2026*
 - **Fellowships & Awards:** **Ferienakademie 2026** - selected for the “AI for Games” course under Prof. H. Köstler and Prof. J. Pirker. **DSSGx Fellow 2024** - one of ten fellows selected for the Data Science for Social Good program, LMU München.
 - **Relevant coursework:** Deep Learning, Machine Learning, GPU Programming, Advanced Visual Processing, Acquisition and Analysis of Eye Tracking Data, Computer Architecture, Operating Systems
- **Assam Engineering College** Guwahati, IN
 - *B.E. in Instrumentation Engineering; Thesis Grade: 1.3* *Aug. 2016 – Nov. 2020*
 - **Fellowships & Awards:** **Winter Overseas Fellowship** - Government of India merit scholarship for a research visit at the University of Warwick, 2020. **Merit Scholarship for Academics** - awarded 2018, 2019 and 2020.

PUBLICATIONS

- **Rare Object Retrieval for Autonomous Driving:**
F. Embacher*, **M. Barman***, J. Uhrig, M. Enzweiler
Submitted to WACV 2026 (*under review*) | *Equal contribution
- **Automating Data Integration and Publishing for Neuroimaging via LSLAutoBIDS:**
M. Barman, J. Range, B. Ehinger
Aperture Neuro, Vol. 6, Issue SI 1, 2026 | doi:10.52294/001c.159415 | presented at deRSE 2026 (presenting author)
- **From Monitoring to Forecasting: An Integrated Visitor Insights Tool for Protected Area Management:**
M. Mangold, **M. Barman**, A. Garove, P. Ferreira, A. Younas, J. Ostheimer, J. von Bartenwerffer, M. Heurich
Journal of Outdoor Recreation and Tourism (*under review*)
- **CryptoQA: A Large-scale Question-answering Dataset for AI-assisted Cryptography:**
M. Elfares, P. Reisert, T. Dietz, **M. Barman**, A. Zaki, R. Küsters, A. Bulling
arXiv preprint arXiv:2512.02625, 2025
- **Object Detection and Tracking Turret based on Cascade Classifiers and Single Shot Detectors:**
P. Gogoi, **M. Barman**, M. Deka, U. Rajkonwar, R. Moudgollya
International Conference on Computational Performance Evaluation (ComPE), Shillong, IN, 2020
- **Deep Learning Based Flood Mapping: A Case Study from a Flood-vulnerable State in Northeastern India:**
M. Barman, P. Gogoi, S. Goswami, H. Nagendra
Conference abstract, American Geophysical Union (AGU) Fall Meeting, Chicago, USA, 2022

RESEARCH EXPERIENCE

- **Mercedes-Benz AG R&D and Universität Stuttgart** Sindelfingen, DE
 - *Master Thesis and Research Intern* *Aug 2025 – May 2026*
 - **Master Thesis (Oct 2025 – May 2026):** Designed a two-stage rare-object retrieval framework combining vision-language models with transformer-based detection, and proposed a novel end-to-end retrieval metric evaluated on the SearchADORE dataset. Supervised by Prof. Bin Yang (Institute of Signal Processing and System Theory) with the Mercedes-Benz Scene Understanding team; resulted in a co-first-authored WACV 2026 submission.
 - **Research Intern (Aug 2025 – Sep 2025):** Benchmarked the in-context learning capabilities of SOTA VLMs for image classification in the context of rare image retrieval for autonomous driving on the SearchAD dataset, under Jonas Uhrig and Felix Embacher.
- **Carl Zeiss AG** Oberkochen, DE
 - *Research Intern, Corporate Research and Technology* *Oct 2024 – Apr 2025*
 - **Overview:** Developed a .NET software solution integrating multimodal interfaces for hands-free microscopy control, and analysed the limitations of multimodal foundation models in the specialised context of microscopic imaging. Under David Dobbelsstein and Daniel Werdehausen.

- Ludwig Maximilian University of Munich (DSSGx 2024)** Munich, DE
Research Fellow *Aug 2024 – Sep 2024*
 - Overview:** Built an end-to-end data science pipeline to address overcrowding in Bavarian Forest National Park: consolidated heterogeneous visitor-counter and contextual data into a unified store, engineered features, and trained and validated time-series models forecasting visitor traffic, delivered as a decision-support tool for park management. Stakeholder: Nationalparkverwaltung Bayerischer Wald; academic partner: Universität Bayreuth. Led to a co-authored manuscript under review at the *Journal of Outdoor Recreation and Tourism*. [Link]
- Collaborative Artificial Intelligence Group, Universität Stuttgart** Stuttgart, DE
Wissenschaftliche Hilfskraft & Research Project *Nov 2023 – Jul 2024*
 - CryptoQA:** Designed the structure of the CryptoQA benchmark and fine-tuned open-source LLMs on it (Llama-2 and Mistral 7B/13B variants, including math-specialised MetaMath models) to study the capability of open models on cryptanalysis, then analysed base vs. fine-tuned behaviour to characterise their reasoning. A sample of the dataset and a few fine-tuned models were released publicly. Under Prof. Andreas Bulling and Mayar Elfares. [Code] [Models]
 - Gaze3P:** Implemented and set up the recording software, configured and calibrated the eye-tracking hardware, and built part of the gaze data processing pipeline.
- Computational Cognitive Science Group, Universität Stuttgart** Stuttgart, DE
Wissenschaftliche Hilfskraft *April 2023 – May 2024*
 - LSLAutoBIDS:** Developed the open-source Python package LSLAutoBIDS with Prof. Benedikt Ehinger, automating conversion of EEG recordings (XDF) to BIDS, Datalad integration and upload to Dataverse, promoting open science by design. [Link]
 - Co-registered EEG and eye-tracking dataset:** Co-authored *A co-registered EEG and eye-tracking unrestricted viewing data set on natural images* (Schepers, Marathe, Barman, Ehinger; ECVP 2025, Mainz): contributed the experiment design and recording software, and ran the pilot studies validating the acquisition setup.

SELECTED PROJECTS

- CHATtacker: Role Playing in Large Language Models:** Analysed the effects of role-playing prompts on SOTA LLMs and explored offensive and defensive countermeasures.
- Visual World Paradigm:** Eye-tracking study on how phonetic and semantic similarity shape human next-word prediction, using Gazepoint recordings.
- GPU Implementation of a JPEG Encoder:** Implemented a JPEG encoder in OpenCL and analysed the speedup of the GPU implementation.

TECHNICAL SKILLS

Languages: Python, C++, C#, Bash, SQL, L^AT_EX

ML / DL: PyTorch, TensorFlow, Hugging Face (Transformers, PEFT/LoRA), scikit-learn, NumPy, Pandas, OpenCV, Weights & Biases

LLM / VLM: vision-language models, in-context learning, fine-tuning, RAG, LangChain, FAISS

Infrastructure: Linux, Git, Docker, AWS, SLURM / GPU clusters, CI/CD, OpenCL, .NET

Eye Tracking & Neuro: Lab Streaming Layer (LSL), BIDS, Datalad, Dataverse, OpenSesame, Gazepoint, Tobii

LANGUAGES

Assamese (native) | **English, Hindi** (professional working) | **German** (elementary)

INTERESTS

Vocalist, playing ukulele, hiking, blogging and Zumba