

Akshay Agrawal

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[LinkedIn](#) | [Github](#) | [Website](#)

EDUCATION

Christian Albrechts Universität, Kiel, DE Master of Science (M.Sc.) Major: Computer Science	2019-2023
Xavier Institute of Engineering, Mumbai, India Bachelor of Engineering (B.E.) Major: Computer Science	2015-2019
Udemy Web Development Bootcamp Major: MERN Stack	2024-Present

SKILLS & INTERESTS

- **Languages:** English (Native), German (Intermediate)
- **Programming Languages:** Python, C++, JavaScript, HTML5, CSS3
- **Frameworks and Libraries:** Flask, React, Node.js, TensorFlow, Keras, NumPy, Pandas
- **Database:** SQLAlchemy, MongoDB, MySQL
- **Technologies and Tools:** Docker, Git, AWS, CI/CD, Linux, Jupyter Notebook, RESTful API
- **Interests:** Photography, swimming, cooking, and volleyball

WORK EXPERIENCE

ZeroBS GmbH, Kiel DE <i>FullStack Developer</i> <ul style="list-style-type: none">• Developed a CMS infrastructure that improved efficiency, leading to 3x productivity, involving backend development using Flask and frontend development with JavaScript and Jinja2 templates.• Implemented Agile methodologies and automation of manual processes, reducing operational overhead by 90%.• Crafted one-click deployments, providing the client with complete autonomy and authority.• Deployed and managed up to 5,000 processes of different cloud providers (AWS, Digital Ocean) on the Python module Terraform.• Maintained asynchronous job queues for application stability using Celery, and RabbitMQ.• Collaborated with core team members conveying problems, solutions, updates, and project status to management, along with program and user documentation. Skills Learnt: Web development, Infrastructure management, Communication	Oct 2021 – July 2022
Christian Albrechts Universität, Kiel DE <i>Research Assistant (Information Systems)</i> <ul style="list-style-type: none">• In collaboration with the supervisor, Conducted data analysis for over 100 computer science course offerings at CAU, Kiel, collaborating with the supervisor to find insights, patterns, and correlations to enhance the curriculum.• Utilized Neo4j to create and manage graph databases, for better data visualization and interpretation of course relationship, providing a comprehensive understanding of the curriculum.• Designed a web-based structure using Flask to highlight complex data relationships, for effective data exploration. Skills Learnt: Insight's analysis, Collaboration, Data Visualization	Apr 2023 – Sept 2022

PERSONAL PROJECTS

Non-Neural Twin for Simple Autoencoders

Master Thesis - [Github](#)

- Researched and compared various non-neural machine learning methods giving a potential replacement for an **unsupervised neural network**.
- Identified and experimented **VQPCA** as a superior data reduction technique for linear relationships, surpassing the MSE results for **Autoencoders** by 10^{-1} % resulting in enhanced interpretability.
- Managed and processed synthetic and real-world datasets with dimensions up to 30, along with refining **data reduction algorithms** using Python libraries including **NumPy**, and **Pandas**.
- Data visualization of up to 500x500 using **Matlab** and **Seaborn**, for decision-making by comparison of different heatmaps.

Skills Learnt: Machine Learning, Deep Learning, Neural Networks(Keras, TensorFlow)

Sequencer

Distributed Systems

- Designed and coded a Sequencer for a distributed environment using Python's web framework Flask that handled access requests concurrently.
- Addressed challenges related to concurrency, fault tolerance, and scalability challenges for system efficiency and reliability.
- Collaborated on issue resolution and system optimization to enhance user experience.

Skills Learnt: Distributed systems, Concurrency, Mininet

Autonomous Driving Car in ROS for Formula Student

Master Project - Visual Modelling

- Engineered an algorithm for **centerline estimation**, optimizing the car's path on the race track and enhancing speed performance.
- Spearheaded supervised **machine learning(SVM)**, for detailed track analysis and trajectory optimization.
- Performed **interpolation** of track data improving accuracy in trajectory calculation using **scipy.bspline**.
- Operated ROS for simulating the car's behavior and collaborated in weekly multi-team meetings for updates and idea discussions.
- Visualized track data and the centerline using **Matplotlib** and **Wandb**, evaluating performance on multiple datasets.

Skills Learnt: Computer Vision, Simulation, C++, Cmake, numerical analysis