Akshay Agrawal

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EDUCATION

Christian Albrechts Universität, Kiel, DE **2019-2023**
Master of Science (M.Sc.) | Major: Computer Science

Xavier Institute of Engineering, Mumbai, India **2015-2019**
Bachelor of Engineering (B.E.)| Major: Computer Science

Udemy **2024-Present**
Web Development Bootcamp | Major: MERN Stack

SKILLS & INTERESTS

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

WORK EXPERIENCE

Christian Albrechts Universität, Kiel DE **Apr 2023 – Sept 2022**
Research Assistant (Information Systems)

- 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 Visulaization

ZeroBS GmbH, Kiel DE **Oct 2021 – July 2022**
FullStack Developer

- 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 **automated** 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

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)

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 discussionss.
- Visualized track data and the centerline using **Matplotlib** and **WanDb**, evaluating performance on multiple datasets.

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