

# Akshay Joshi

M. Sc. Data Science & Artificial Intelligence

Graduate student with an extensive background in Semiconductor & Software Engineering R&D, currently pursuing research in Self-supervised Learning, Visual Scene Understanding, and Multimodal Representation Learning at Universität des Saarlandes & DFKI.

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## WORK EXPERIENCE

### Deep Learning Research Assistant

German Research Center for Artificial Intelligence

11/2020 - Present

Saarbrücken, Germany

- Developing novel deep neural Transformer-based BioMedical Language Model architecture with Linear Self-Attention. 🔗
- Self-supervised models pre-trained on PubMed & MAUDE datasets which comprise more than 50 million citations for Biomedical research literature hosted by US FDA.
- Built highly parallel & computationally efficient Semantic Search, Information Retrieval & Recommendation Systems for Smart Vigilance in Medical Product Research & Development.

### Graduate Teaching Assistant

Artificial Intelligence Group, Saarland University 🔗

10/2020 - 03/2021

Saarbrücken, Germany

- TA for the lecture 'Architectures for Intelligent Systems' offered by Prof. Dr. Jana Koehler (Chair of AI Group & Scientific Director of Algorithmic Business & Production research dept. at DFKI). 🔗
- Developed a reference architecture & corresponding architectural design documents for Amazon Alexa powered Smart Digital Assistants for Conversational Question Answering.
- The lecture has a cohort of ~40 M. Sc. Computer Science students.

### Software Engineer I

AMD Research & Development 🔗

08/2018 - 09/2019

Bangalore, India

- Instrumental in the design & development of Platform Security Processor firmware for AMD Ryzen, Threadripper & EPYC CPUs.
- Owner for the design & validation of Microsoft PlayReady DRM protection technology for Ryzen Desktop & Mobile processors.
- Recommended by the Director of Software Engineering at AMD for my technical expertise and agile adaptability skills.

### Software Engineering Intern

AMD Research & Development 🔗

02/2018 - 08/2018

Bangalore, India

- Maintained & validated AMD Ryzen Master Software Development Kit for CPU & Memory Overclocking (Frequency/Voltage) utilities.
- Delivered ~70 multi-platform Windows SDK APIs in 6 months.

### Engineering Intern

Alstom 🔗

01/2017 - 03/2017

Bangalore, India

- Developed the data pre-processing pipeline which involved Data Cleansing, Wrangling & Dimensionality Reduction.
- Built Multivariate Regression & Autoregressive Integrated Moving Average (ARIMA) Forecast models for predictive analytics.

## EDUCATION

### M. Sc. in Data Science & Artificial Intelligence

Universität des Saarlandes 🔗

10/2019 - 03/2022

Saarbrücken, Germany

### B. Eng. in Computer Science & Engineering

Visvesvaraya Technological University 🔗

08/2013 - 06/2017

Bangalore, India

## TECHNICAL SKILLS

Python PyTorch C++ NumPy Scikit-learn  
SQL OpenCV Vision NLP ML RESTful  
R Statistics Deep Learning Graphics ASR  
Tableau Apache Spark Data Mining Kubernetes  
Docker C AB Testing GIT Image Processing

## RESEARCH PAPERS

Art Style Classification with Self-Trained Ensemble of AutoEncoding Transformations 🔗

*Investigating the effectiveness of self-supervised vision architectures to extract dense features in complex & ambiguous artistic images. Self-supervised pretraining used to resolve class-imbalance of WikiArt dataset. Outperformed existing state-of-the-art methods with an overall F1 Macro gain of ~20%.*

## RESEARCH PROJECTS

Exploiting Point-level Correspondences for Unsupervised 3D Point Cloud Understanding (06/2021 - Present)

Containerized Secure Microservices Mesh with Flask, Unicorn, NGINX, & Kubernetes (06/2021 - 06/2021)

- Implemented highly scalable, resilient, and secure RESTful microservices mesh with SSL/TLS & Apache NGINX Ingress load balancer.

3D Pose and Shape Estimation with Stitched Puppet Model & Max Product Belief Propagation (01/2021 - 03/2021)

Multi-stage Informational Retrieval & Ranking System using LM, BM25 (Okapi, Plus), TFIDF (08/2020 - 08/2020) 🔗

- The query processing time was reduced to ~8 mins from 20 mins using parallel processing, caching & efficient data structures.

Open-domain Question Answering with Memory Networks over Knowledge Graphs & Text (07/2020 - 08/2020) 🔗

- Pre-trained the network on bAbI dataset for text understanding and reasoning. Achieved overall Precision of ~70% & Recall of ~85%.

Real-time Event-driven Multilane Vehicle Detection & Counting with YOLO (05/2020 - 06/2020) 🔗

## SEMINARS & CONFERENCES

Hybrid Machine Learning Seminar on 'Learning like Humans with Deep Symbolic Networks' (11/2020 - 02/2021) 🔗

Research Poster on 'Advanced Cryptographic Standards & Security' at Computer Society of India (04/2017 - 04/2017)

Seminar on 'High Performance Quantum Computing' at Cambridge Institute of Technology (03/2017 - 05/2017)

## HONOURS & ACHIEVEMENTS

Ranked in the Top 5% of the graduating class of Bachelors in Computer Science & Engineering (08/2013 - 07/2017)

Total number of Graduating Students: 106

## LANGUAGES

English  
Full Professional Proficiency

German  
Limited Working Proficiency