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, Neuro-Symbolic Reasoning, Multilingual Language Modelling & Automatic Speech Recognition 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 databasets which comprise more than 50 million citations for Biomedical research literature hosted by US FDA.
- Building 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

Semi-supervised ASR for South Indian Languages with NST, Conformers & Robust Wave2Vec 2.0 (05/2021 - Present)

Containerized Secure Microservices Mesh with Flask, Gunicorn, 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 & Sum 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 End-to-End Memory Networks over KG & 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 & OpenCV (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