SANGAMITHRA PANNEER SELVAM

e-mail: psmithra0610@gmail.com | *Phone:* +49 151 45849640 | *Stuttgart, Germany*
LinkedIn | *GitHub* | *Portfolio*

EDUCATION

University of Stuttgart - *CGPA – 2.4 (5th semester)* — Stuttgart, Germany
Master of science in Electrical Engineering — October 2019 – Present

Anna University – *CGPA – 1.8 First Class with Distinction* — Chennai, India
Bachelor of Engineering in Electrical and Electronics Engineering — August 2015 – May 2019

EXPERIENCE

Ferdinand Steinbeis Research Institute — Heilbronn, Germany
Research Intern — November 2021 – April 2022

- Developed NLP-Content Based Recommender System architecture to find business ecosystem partners and traits leading to 95% reduction in manual effort and provides 360° business value.
- Enriched company profiles with web-scraping and unstructured data processing using TensorFlow and NumPy.
- Conceptualised a new trait prediction idea of companies with clustering algorithm and data visualisation on Tableau.
- Modelled Ontology, Knowledge graph on Neo4j graph databases to map company profiles. Formulated Cypher Query to get top ranking of companies with evaluating metrics of 83% precision and 86% recall.
- Created an automated recommend system with model pipeline by deploying trained deep neural networks, language models and ML algorithms with 85% accuracy.

Ferdinand Steinbeis Research Institute — Heilbronn, Germany
Student Research Assistant — September 2020 – September 2021

- Aided as a research student for the Vice President co-innovation at Bosch.
- Collaborated closely on AIoT framework and worked in AIoT Lab on Pneumatic System research project.
- Co-ordinated the launch of AIoT playbook by Bosch connected world as a member of Expert Network.
- Acted as front-end developer of AIoT Framework, Agile Scrum master & Machine learning research engineer for AIoT lab, Miro Board -AIoT masterclass organiser, LeanIX modelling and handled procurement department.

Institute of Aircraft Design (SWE), University of Stuttgart — Stuttgart, Germany
Scientific Research Assistant — September 2020 – March 2021

- Undertook wind turbine Force - Torque coupling model using Simpack tool to reduce electro-mechanical interactions.
- Built first time C user routine from Fortran with faster computation of 1.5× times and contributed to first level documentation of C framework on Simpack. Implemented Java Native Function to call Java method from C program.

Michelin Tyres — Chennai, India
Automation Intern — September 2018 – February 2019

- Performed data analysis using data engineering techniques on spare parts for purchase department.
- Optimized stock on hand and cost using python for drives, rollers & motors by component level mapping of machines.
- Detected duplicate codes on electrical spare parts among 17000 parts and achieved an efficiency of 80%, thereby contributing to cost savings by 20% (confidential) in annual expenditure.

PROJECTS

Automated analysis of requirements for testing of autonomous vehicles — Stuttgart, Germany
Artificial Intelligence — June 2022 – Present

- Analysed requirements & developed architecture for automated test case generation through AI language models - Bert & word2vec with NN for classification with 95% accuracy.
- Extracting RDF triples from structured data to model parameters using OWL ontology and SPARQL for test cases.
- Facilitating a link between requirements & test engine to minimize test cases and validate through SW engineering.

AI-Perfect Wedding Planner Stuttgart, Germany
Data Science June 2022 – August 2022

- Designed an end-to-end AI solution to predict cost estimate & recommend suitable selection for the perfect wedding, reducing time by 95%. Gathered 21 features for wedding data through Selenium driver.
- Applied ETL transformation on raw wedding data using SSDT-BI tool in MySQL server and created stored procedures to derive WRK table with contributing features.
- Analysed dependent features of a wedding using bins, visualization, A/B, classification and Chi-squared test through Tableau.
- Predicted wedding cost with 15 input features using regression algorithm with 0.79 adjusted r2 score in R.
- Queried RDBMS to recommend top location, destinations, cost per person etc. based on season and priorities.

Distributed Training of Neural Network Stuttgart, Germany
Deep Learning April 2021 – October 2021

- Analysed distributed training of ResNet18 CNN model on GPU and CPU Linux HPC machine clusters to reduce computational intensity and memory demands of DNN.
- Trained the model by parallelism techniques with PyTorch and Message passing interface with relevance of batch size and average gradients using DP & DDP PyTorch packages.
- Observed result includes overhead in communication, training time & training accuracy over 95% and reduction in training times by 3× times on CPU and 54.5× times on GPU.

Pneumatic System Use case Heilbronn, Germany
Artificial Intelligence - AIoT lab May 2021 – September 2021

- Built a system that utilizes AI-based sound analysis to detect leakages in pneumatic systems with a goal to evaluate Holistic DevOps and AI/Machine learning model reuse with cost reduction of over 96%.
- Designed architecture stack on LeanIX tool including data flow, domain overview and digital twin overview diagrams.
- Analysed 1.7 million sound data by data engineering techniques and with Mel - frequency cepstral coefficients.
- Trained multiple deep neural network models by data ingestion through a hyperparameter tuning system.
- Created model repositories for MLOps execution with detection accuracies over 90%, and deployed on RPi.

PUBLICATIONS

- Lüdecke, F.D.; Schmid, M.; Rehe, E.; Panneer Selvam, S.; Parspour, N.; Cheng, P.W. "*Numerical Aspects of a Two-Way Coupling for Electro-Mechanical Interactions - A Wind Energy Perspective*". Energies 2022, 15, 1178.
- P.Sangamithra, M. Kishore Abishek, "*Modeling And Analysis Of Touch Screen Based Wireless Control Of Four Motor Robotic Vehicle Employing Knowledge-Based System And Ensemble Machine Learning*". IJEET, Volume 9, Issue 2.

SKILLS & INTERESTS

Languages – English | German B1 | Tamil. ***Interests*** – Formula 1 enthusiast; history documentaries; strum guitar

Programming Languages & Libraries– C | C++ | Java | Python | R | React | SQL | MPI | Html | CSS | Linux | LaTeX | Cypher Query | JNI | Pandas | NumPy | Matplotlib | Seaborn | Scikit-learn| PyTorch| Tensorflow | Keras | SpaCy | CoreNLP | Standford parser| HuggingFace | NLTk

Tools & Technologies – PSpice | MATLAB | Tableau | Protégé | Neo4j | Arduino IDE | AWS | Docker | Git | Jupiter | Kubernetes (Basic) | Hadoop with Spark | Anaconda | Visual Studios | MS Office.

LEADERSHIP AND ACHIEVEMENTS

Deutschlandstipendium - *Robert Bosch GmbH and Wagner Stiftung* April 2020 – April 2022

General Co-ordinator, National Service Scheme March 2015 – April 2018
Managed 100 volunteers and 10 department coordinators. Conducted 35 events including coast line clean-up, Road safety campaign. Organized blood donation camp securing a state level award.

CERTIFICATIONS

- The Ultimate Hands-On Hadoop **|** DevOps Beginners **|** Statistics & Business Analytics Udemy 2022 - Present
- Data Science with ML, NLP, DL and RL **|** Ultimate AWS Certified Cloud Practitioner Udemy 2022
- Business Model Development Facilitator AIoT Masterclass 2021