SWATI KAR

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SUMMARY

- 3 years of hands-on experience with cutting-edge data science, machine learning, deep learning, computer vision, and reinforcement learning model development and deployment to AWS to solve business problems.
- Proficient in Python, and big data analysis, with extensive experience in PySpark, TensorFlow, PyTorch, and scikit-learn for building and deploying optimized machine learning models.

EDUCATION

Clarkson University, Potsdam, New York **Jan 2023 - Dec 2024 (expected)**

- **Master of Science**, Department of Electrical & Computer Engineering
- **Thesis:** Deep Reinforcement Learning for Autonomous Drone Navigation

Rajshahi University of Engineering & Technology, Rajshahi, Bangladesh **Mar 2014 - Nov 2018**

- **Bachelor of Science** , Department of Computer Science & Engineering
- **Thesis:** Comparative Analysis of Mining Fuzzy Association Rule using Genetic Algorithm.

RESEARCH INTERESTS

- Machine Learning, Deep Learning, Reinforcement Learning, Generative AI & Computer Vision

SOFTWARE SKILL HIGHLIGHTS

- **Languages:** Python, MATLAB, SQL, C, C++, R, Shell Scripting
- **AI Tools:** Tensorflow, Keras, PyTorch, OpenAI (ChatGPT), LangChain, Huggingface, Llama2, CUDA
- **Data analysis tools:** Power BI, PySpark, NumPy, Pandas, Matplotlib, scikit-learn, MongoDB, MS Excel
- **Image Processing Tools:** OpenCV, ImageJ(Fiji), YOLO, PIL
- **Web Development Tools:** HTML, CSS, Streamlit, Flask, AWS (SageMaker, S3 bucket, Glue, Athena, Lambda), Databricks, Snowflake
- **Project management:** Git, JIRA, Agile Project Management System, MS Office Suite
- **Soft skills:** Communication, Presentation, Teamwork, Financial Market Analysis

PROFESSIONAL EXPERIENCES

Teaching Assistant, Clarkson University, NY **Jan 2023 – May 2024**

- Teaching Assistant for EE 567 (Software System Architecture), EE 262 (Introduction to Object-Oriented Programming & Software Design), and ES 100 (Introduction to Engineering & Computer Use with MATLAB)

Front-end developer Intern, Shurjomukti Ltd., Dhaka **Jan 2021 – Apr 2021**

- Worked on an ERP software focusing on Shurjomukhi inventory management using Vue.js, Node.js, and MySQL.

RESEARCH & PROJECT EXPERIENCE

AutoNav: Deep Reinforcement Learning for Autonomous Drone Navigation [Ongoing]

- Developed and implemented reinforcement learning algorithm(Deep Q learning) for autonomous drone navigation
- Explored and tested various reward mechanisms to identify the optimal path to reach the target.
- Technologies: Deep Reinforcement Learning, Python, Tensorflow, AirSim.

Emergency Medical Service (EMS) Analysis using GenAI [Ongoing]

- Enhanced EMS response by automating medication suggestions based on patient demographics, improving treatment accuracy by utilizing generative AI technology.
- Technologies: Python, Pandas, SQLAlchemy, MySQL, Llama Index, and OpenAI API

Document Search Bot [Link]

- Developed a chatbot aimed at providing Q&A functionality by processing user prompts through a language model, delivering accurate responses with references, using Streamlit and Langchain for a seamless and interactive experience.
- Technologies: Python, OpenAI API, Langchain, Streamlit.

Deep Learning Analysis of Cell Movement on Nanofiber Substrates [Link]

- Implemented UNet for cell segmentation in microscopic images using Apeer.com & ImageJ for labeling, enhancing cell movement tracking through deep learning and image processing, which helps to detect early signs of abnormal cell movement.
- Technologies: Deep Learning, Python, TensorFlow, Keras, OpenCV, CUDA. ImageJ

Sales Prediction Forecasting using ARIMA Model [Link]

- Implemented ARIMA model using Python's statsmodels library to forecast time-dependent 'Tractor Sale' dataset, enhancing strategic decision-making by analyzing trends and tuning parameters for optimal selling predictions.
- Technologies: Python, Statsmodels, Matplotlib, Hypothesis testing, Time forecasting.

Indian Premier League (IPL) Data Analysis Using PySpark [Link]

- Developed a PySpark-based data cleaning and transformation pipeline to extract statistical insights and generate visualizations, enhancing the understanding of player and team performances across various seasons.
- Technologies: PySpark, Databricks, Pandas, MySQL, Matplotlib, Seaborn.

Cloud-based Movie Recommendation System [Link]

- Developed a scalable movie recommendation system using the Factorization Machine approach with Amazon SageMaker, preprocessing the MovieLens dataset and training the model to predict user preferences.
- Technologies: Python, Pandas, NumPy, Scikit-Learn, AWS S3, Amazon SageMaker, Boto3, AWS IAM roles, and SageMaker Python SDK.

University Management System [Link]

- Developed a comprehensive University Management System to enhance operational efficiency and improve accessibility of academic resources for administrators, instructors, and students, ensuring high security and reliability.
- Technologies: MySQL, Django, Flask, HTML, CSS.

JOURNALS AND CONFERENCES

Google Scholar statistics total of **12** citations.

1. Swati Kar, Mir Md Jahangir Kabir, "Comparative analysis of mining fuzzy association rule using genetic algorithm", 2019 International Conference on Electrical, Computer and Communication Engineering (ECCE).
2. Minh Nguyen, Jacob Gately, Swati Kar, Soumyabrata Dey, Saptarshi Debroy, "DNN-based Denial of Quality of Service Attack on Software-defined Hybrid Edge-Cloud Systems", 2022 IEEE 22nd Annual Wireless and Microwave Technology Conference (WAMICON).

RELEVANT COURSE WORK AND CERTIFICATIONS

- **Database Systems(Spring 2024):** Obtained 94% marks
- **Deep Learning(Fall 2023):** Obtained 97% marks
- **Stochastic Process(Fall 2023):** Obtained 94% marks
- **AWS ML Course:** AWS Certified Machine Learning Specialty MLS-C01 [2024] [Link]
- **Gen AI:** Completed courses on RAG, Prompt Engineering, Finetuning from Deeplearning.AI website. [Link]