SHALMOLY MONDAL

Melbourne, Victoria | (+61) 0481599990 | www.shalmolymondal.com
https://github.com/ShalmolyMondal | Shal.m@outlook.com | www.linkedin.com/in/shalmoly-mondal

Data Science | PhD in Computer Science | Internet of Things (IoT) | Bridging Research and Innovation

I leverage my expertise in **IoT**, particularly **data analysis**, to design and implement innovative solutions for complex data challenges. My **research contributions** coupled with **industry experience** in sensor data and software engineering, allow me to bridge the gap between research and development. I am passionate about driving digital transformation through AI and data science, and eager to contribute my expertise to the field, by making a difference and developing cutting-edge technologies that make a real-world impact.

TECHNICAL SKILLS

- **Programming:** Python, R, ReactJS, Node.JS, HTML
- **Machine Learning and Deep Learning**: scikit-learn, TensorFlow, PyTorch and Keras.
- **Time Series Forecasting**: ARIMA, SARIMA, Prophet, Holt Winters
- **Databases**: Microsoft SQL, Influx DB, Mongo DB, Oracle
- **Source Control**: Git, AWS CodeCommit
- **Data Analysis Tools/Libraries:**
  - *Python libraries* - numpy, pandas, SciPy
  - *R libraries* - prophet, auto.arima, forecast
- **Data Visualization:** Python, JavaScript, R
  - *Python libraries* - matplotlib, seaborn
  - *JavaScript* – d3.js, ApexCharts.js
  - *R libraries* - ggplot2, plotly
- **Cloud Technologies**: AWS IoT, Microsoft Azure IoT Hub, Fiware, Nectar Research Cloud
- **DevOps:** Docker
- **Embedded Systems:** Arduino, RaspberryPi
- **Big Data Analytics:** Kafka, Amazon Kinesis
- **Project Management**: JIRA

SOFT SKILLS

- **Communication:**
  - Authored peer reviewed publications and **presented research findings** at international conferences, effectively conveying complex technical concepts to both **academic and industry audiences**.
  - Developed **comprehensive documentation** for research projects and software frameworks, ensuring clarity and accessibility for collaborators and end-users.
- **Critical Thinking:** Applied analytical skills, and critical thinking to identify, and co-relation in large and complex datasets, leading to discovery of novel insights and solutions.
- **Collaboration and Teamwork:**
  - Supervised and mentored undergraduate and master's students on research projects, fostering their development.
  - Collaborated with cross-functional teams in academic and industry settings, contributing effectively to interdisciplinary projects.
- **Organization and Project Management:**
  - Demonstrated strong organization skills through well-structured, documentations, code repositories, and research presentations.
  - Successfully managed multiple research work, research projects and industry collaborations concurrently, ensuring timely completion and high-quality deliverables.

WORK EXPERIENCE

BlueIoT • *July 2023 – Current*
***IoT Data Analyst**, Mulgrave, Australia*

Python | AWS | ReactJS | Tailwind

- Designed and developed **interactive air quality monitoring dashboards** from scratch using **React.JS,** significantly **enhancing user experience**. The result is an improved, a more **effective** and **user-friendly** approach to summarize air quality information.
- Analyzed raw sensor data from **multiple sources** and performed initial data pre-processing in **Excel** and conducted basic Exploratory Data Analysis (**EDA**) using **Python** libraries such as **NumPy** and **Pandas**.
- Created **interactive visualizations**, including **charts and graphs**, to summarize the key insights from the sensor data.
- Set up **databases**, and executed **SQL queries** to extract relevant data from **Amazon Timestream** and **Dynamo DB.**
- Worked closely with the IoT and software development team using **agile methodology**.
- Assisted in migrating existing infrastructure to **AWS** cloud by assessing the current infrastructure to determine feasibility and requirements for the migration.

IoT and Data Science Researcher • *June 2019 – June 2023*
***Internet of Things Lab, Swinburne University of Technology**, Australia*

Python | AWS IoT | Machine Learning | ReactJS | Flask | DynamoDB | MATLAB | R

- **Led the development of a novel adaptive data generation framework for IoT applications:** Designed and implemented an end-to-end system utilizing **data science techniques** (Python, Scikit-learn), **cloud platforms** (**AWS**, Fiware), and **front-end technologies** (ReactJS, Node.js) to generate customized datasets for diverse IoT scenarios. This framework empowers researchers and developers to conduct robust performance testing prior to real-world deployment, significantly optimizing R&D processes.
- **Extracted hidden patterns and trends from complex datasets:** Employed **statistical analysis techniques** (t-tests, Chi-square tests)

and **distribution evaluation** (Normal, Gaussian) to uncover hidden insights within large datasets, contributing to informed decision-making and model development.

- **Applied time series forecasting for future trend prediction:** Leveraged advanced **time series forecasting** techniques to accurately predict future data trends within IoT applications, enabling proactive response and resource optimization.
- **Open-source contribution:** Actively contributed to open source IoT solutions, collaborating with the community to enhance functionality and drive innovation.
- **Mentored and supervised projects:** Successfully guided two capstone projects to develop and implement end-to-end solutions.
- **Communicated research findings through publications:** Authored and published research work in renowned journals and international conferences contributing to the field of IoT and data science research. Publications can be accessed here **Google Scholar**.

Sessional Academic • *March 2020 - Current*
***Swinburne University of Technology**, Australia*

- Tutored 2 undergraduate and 3 master courses in **big data**, **data visualization**, and programming (Ruby, JS, and **Python)**.
- Developed teaching materials, planned weekly tasks, graded assignments, and monitored student progress through effective assessment strategies.
- Supervised master's level projects in **IoT**, **Big Data**, and **Data Science** providing guidance and support to over 150 students.

Software Engineer • *March 2017-March 2019*
***Infosys Limited**, Hyderabad, India*

SQL Oracle

- Worked on Oracle APPS as an **SQL developer** specifically focusing on their ERP systems.
- Created logical and technical documents, including operational procedures and configuration guides to guide the development team.
- Conducted thorough testing, **troubleshoot**, and bug fixing.
- Collaborated closely with cross functional teams, including clients to meet project goals, maintain project quality, and timely delivery.
- Received "Rookie of the Year" award - Q2, 2018

PROJECT PORTFOLIO

Activity Recognition in Smart Manufacturing:

- Needed to accurately classify various activities of factory workers within a manufacturing process.
- I implemented effective machine learning techniques that could achieve precise activity recognition specifically **SVM** and **Random Forest**, to develop a **classification system** for activities in the smart manufacturing IoT application.
- The implemented **machine learning models** demonstrated high accuracy in classifying diverse activities, contributing significantly to the overall success of the smart manufacturing project. Machine Learning Python

Faded Road Marking Detection:

- Collaborated with the Brimbank Council to address night-time driving risks associated with faded road markings.
- **Analyzed real-time data** from Nerian stereo vision depth cameras, implementing **deep learning models** and **computer vision techniques**.
- Conducted extensive research and experimentation to optimize model accuracy and efficiency, resulting in a **72% accuracy**. Python Deep Learning

Face Recognition System:

- Implemented a face recognition system, utilizing **eigenface and distance classifier,** and achieved an accuracy of **93.33%.**
- Applied advanced **image processing** and **statistical pattern recognition** in **MATLAB** and utilized **PCA** technique to extract the relevant features for image processing. This implementation resulted in a notable **16% increase** in the overall accuracy.
- Authored and published work in peer reviewed journals and international conferences showcasing the research findings and contributions in the field. MATLAB Statistical Analysis

Portfolio Website:

- Built and designed my professional portfolio website to demonstrate my technical skills in **web design**, development, and **content creation**, while also exhibiting my ability to present my work and skills in a professional and accessible manner. (Link to website in the bio at top of the page) ReactJS Redux Git

CERTIFICATIONS

- AWS Certified Cloud Practitioner Certificate – Issued January 2020
- AWS Academy Accredited Educator – Issued January 2020
- IBM Data Science Professional Certificate, Coursera - Ongoing
- Contributed to open-source project (https://github.com/IBA-Group-IT/IoT-data-simulator)

EDUCATION

Ph.D. in Computer Science | Swinburne University of Technology, Melbourne, Australia, *June 2019 – June 2023*

M.Tech in Computer Science (Spl in Information Security) OGPA – 8.3/10 | IIT (ISM), India *July 2014 – May 2016*

B.Tech in Computer Science and Engineering, DGPA – 8.6/10 | Calcutta Institute of Technology, India *July 2010 – June 2014*