**Debdeep Paul**

Address: 70 Jalan Tiga Ratus, Singapore 488090

Linkedin: <https://sg.linkedin.com/in/debdeep-paul-8181a717>

Residential status: Singapore PR Mobile: +65 93710817 E-Mail: paul.debdeep@gmail.com

**JOB EXPERIENCE**

**Jul 2021 – Panasonic Holdings Corporation Singapore**

**Present AL/ML Technology Lead**

**Expertise** Artificial intelligence and machine learning (AI/ML), generative AI, large language model, deep learning, reinforcement learning, explainable AI, causal inference, Continuous Integration (CI) and Continuous Deployment (CD), MLOps.

Role: Spearheading the full lifecycle of AI/ML product development, strategize and implement solutions that harness data-driven optimization amidst inherent uncertainties. Foster close collaboration project management with sales & marketing, manufacturing teams, IT to ensure a smooth and iterative development process. Lead with hands on development and dedicated to the mentorship of team members, empowering them to make significant contributions to technology advancement, deployment in production environment and monitoring.

*Achievements: Received the esteemed President's Award for pioneering AI/ML technologies within supply chain operations, significantly advancing service initiation across three major business divisions within Panasonic.*

*Projects handled:* Natural Language Processing (NLP) and Generative AI:

*At the forefront of establishing a new technology development pillar focused on unlocking the potential of generative AI. This initiative spans various business units, leveraging AI/ML to innovate and create value in diverse applications.*

Use cases: *Sentiment analysis for forecasting with internal and external text data, product portfolio optimization, new product* *planning, new business opportunities in emerging markets.*

Explainable AI and causal inference:

*Cultivating advanced capabilities to demystify AI decision-making processes, fostering trust among domain experts and expediting the integration of AI technologies. Developing versatile solutions applicable to prevalent AI/ML models, facilitating their deployment across varied systems leveraging causal inference and A/B testing methodologies.*

Change point detection:

*Developed capabilities to detect, predict and explain the change points in a multivariate time series.*

Cyber security:

*Cyber threat detection, vulnerability prediction using NLP and survival analysis.*

Patents filed and granted:i) Transforming data on heterogeneous timescale- US20220058669A1, ii) Feature engineering to incorporate human in the loop AI- US20230032011A1, iii) Novel framework for forecasting highly fluctuating target variable- US20240119470A, iv) Markov chain based change point detection- US20240320694A1.

**Jul 2019 – Panasonic Holdings Corporation Singapore**

**Jun 2021 Senior Data Scientist**

*Projects handled:* Prescriptive analytics:

*Architecting a cutting-edge technological framework designed to prescribe actionable strategies for minimizing or maximizing a defined objective function. This seamlessly integrates ML algorithms with advanced optimization techniques, enabling data-driven decision-making and efficiency improvements.*

*Use cases: Inventory management (PoC completed, under deployment with 2 business divisions).*

Demand forecasting and sales analytics:

*Engineered a patented, comprehensive demand forecasting platform that encompasses robust feature engineering and utilizes sophisticated machine learning methodologies such as ensemble and deep learning algorithms for enhanced predictive accuracy.*

Anomaly detection:

*Developed a platform for anomaly detection to facilitate predictive maintenance leveraging Bayesian statistical methods, deep learning, supervised and unsupervised learning techniques.*

**Feb 2023 – General Assembly Singapore**

**Dec 2023 Lead Instructor: Data Science Immersive**

**Curriculum:** Tailored for students with quantitative and programming backgrounds, this course dives into the essentials of data science: Python programming, exploratory data analysis, data modeling, and machine learning. Provides hands-on experience you need to synthesise extremely large data sets, build predictive models, and tell a compelling story to stakeholders.

**May 2016 – Singapore Institute of Manufacturing Technology, A\*STAR Singapore**

**Mar 2019 Data Scientist**

Role: Project proposal, internal funding for PoC, development and implementation.

*Projects handled:* Analytics on messy datasets:

*Developed an algorithmic solution for dynamic pricing which considers market competition by leveraging statistical machine learning and optimization, with unknown demand.*

Real time predictive analytics for large sensor networks (IoT applications):

*Developed a method to select hundreds of sensors (out of thousands), for real time monitoring. Algorithmic implementation for anomaly detection based on deep learning methods such as RNN and LSTM.*

AI/ML solution for business interruption insurance:

*Developed a methods for business disruption modeling, pricing, data driven evaluation, Customer Retention and Churn Prediction, customer segmentation, explainable AI and causal inference.*

Last mile logistics (Deep learning for big data applications):

*Enhanced the capability of delivery routing optimization engine by integrating travel time estimation, implemented with 8 clients.*

**Dec 2009 – Tata Motors Limited Ahmedabad, India**

**Dec 2011 Manager, Central Quality, Engines and Transaxle Assembly, Small car**

Role:Responsibility comprised of quality control of the engine and transaxle before passing to the next customer.

*Job description: Field complaint reduction, quality function deployment in engine systems, product and process audits, change management for products and processes from design to production.*

**July 2008 – Tata Motors Limited Pune, India**

**Nov 2009 Assistant Manager, Customer complaint analyst, small car**

Role:Responsible for tracking built in issues observed during manufacturing and field issues.

*Job description: To take up the built-in issues to ensure implementation of corrective and preventive actions.*

**EDUCATION**

**Jan 2012 – Nanyang Technological University Singapore**

**Jan 2016 PhD, School of Electrical and Electronic Engineering** GPA-4.08

**Research focus**: Machine learning, data analytics and optimization for cloud services.

*Description:* Developed optimization-based framework for revenue maximization and operational cost reduction for cloud service providers to increase the profitability.

*Tools used includes mathematical modeling of stochastic systems, convex optimization with appropriate relaxation, supervised and unsupervised learning, predictive modeling, and time series analysis.*

**June, 2008 National Institute of Technology**  **Durgapur, India**

Bachelor of Technology (Electronics & Communication) First class with Distinction

**TRAINING, CERTIFICATIONS, INTERNSHIPS**

**Training & Cloud essentials for Scientists, Engineers, and Technical Managers,** NTU (2024).

**certification Applied Causal Inference:** Certificate from Sphere (2023).

**Project Management Professional:** Attended the training and obtained the certification for completion (2021).

**OR & Analytics:** Advanced methods in operations research and optimization for data analytics (2018), NUS Business School - Analytics & Operations Department.

**Planning and Managing Projects:** Preliminaries of project management (2017), Twenty eighty strategy execution.

**Design of Experiments:** Preliminaries of statistical aspects of design of experiments (2016).

Instructor: Prof Goh Thong Ngee, Industrial & Systems Engineering, NUS.

**Young Entrepreneurship Camp:** 5 days crash course on entrepreneurship, fully sponsored by Nanyang Technopreneurship Center (NTC), NTU (2015).

**Convex Optimization:** Successfully completed the online course and obtained the certificate from

Stanford online (2014).

**Internship Singapore Institute of Manufacturing Technology, A\*STAR Singapore**

**Jun-Dec 2015 Planning and operations management**

*Data driven Supply chain disruption risk mitigation, actuarial science, and extreme event modeling.*

**SKILLS**

**Programming** Python (expert), Julia (beginner).

**Cloud services** Amazon web services (AWS), google cloud platform (GCP).

**Database** PostgreSQL, MySQL

**CI/CD** GitLab, Docker.

**Observability** MLflow, Weights & Biases.

**Optimization packages** Gurobi, CPLEX.

**Interpersonal** Committed to development, keen on continued learning and understanding multi-cultural settings, problem solving by collaborating with team members and constituents, diligence and sincerity, self-motivation and focus on the tasks at hand. Team-work – goal orientation and problem solving through coordinated efforts, interpersonal skills, and interaction in multicultural settings.

**Languages** English(Fluent), Hindi (Fluent), Bengali (Fluent).

**Informatics** MS Office – Word, Excel & Power Point (Proficient), Power BI.