

MILLEND ROY

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RESEARCH INTERESTS

Energy Systems and Technology for Emerging Markets :

- Optimizations in Smart Grids and high-renewable based power systems.
- Reinforcement Learning applications in decision-making and grid control.

EDUCATION

Indian Institute of Technology (IIT), Dhanbad

2017 - 2021

B.Tech in Electrical Engineering

GPA : 9.51/10.0 (Institute Silver Medalist)

Advisors : [Dr. Kalyan Chatterjee](#) & [Dr. Bhukya K. Naick](#)

WORK EXPERIENCE

Microsoft Research Lab India, Technology and Empowerment Lab

– *SCAI Research Fellow* with [Dr. Akshay Nambi](#), [Tanuja Ganu](#)

July 2021 - Present

- * EnCortex, a Decision Management Framework for Smart Grid Utility.
- * Anomaly detection in electric vehicle's battery systems.

– *Research Intern* with [Tanuja Ganu](#), [Dr. Akshay Nambi](#)

Mar 2021 - July 2021

Energy consumption modeling for an electric vehicle fleet.

Indian Institute of Technology (IIT), Dhanbad, Power Systems Lab

Dec 2020 - May 2021

Under-Graduate Student Researcher with [Dr. Soham Dutta](#)

- * Bachelor's Thesis on Reinforcement Learning based Islanding Detection in IEEE 9 Bus System.
- * Machine Learning based adaptive fault diagnosis considering hosting capacity amendment in active distribution network.

Hurrey Tech Ventures R&D

May 2020 - Oct 2020

Data Science Intern

Hurr.AI, a reinforcement learning (AIEd and NLTK) based Recommendation Engine to surface '3Rs' : the right learning material to the right student at the right time.

Vardhan Consulting Engineers

April 2020 - May 2020

Engineering Design Intern

Solar Resource Assessment and loss analysis for Annual Energy Production using PVsyst.

Indian Institute of Technology (IIT), Delhi, Comm. Networks Lab

May 2019 - July 2019

Summer Research Fellow with [Akash K. Mondal](#), [Dr. Swades De](#)

- * Simulation Relays using SR Flip Flop logics and programmed auto-reclosures in circuit breakers
- * A comprehensive survey of islanding detection methods.

PUBLICATIONS

* - equal contribution

Under Review

3. [EnCortex: A General, Extensible and Scalable Framework for Decision Management in New-age Energy Systems](#)
Vaibhav Balloli*, **Millend Roy***, Anupam Sobti, Tanuja Ganu, Akshay Nambi. In: *20th USENIX Symposium on Networked Systems Design and Implementation (NSDI'23)*. Boston, MA, USA.
2. [Machine Learning Based Adaptive Fault Diagnosis considering Hosting Capacity Amendment in Active Distribution Network](#)
Sourav Kumar Sahu, **Millend Roy**, Soham Dutta, Debomita Ghosh, Dusmanta Kumar Mahanta. In: *Electric Power Systems Research (EPSR'23)*
1. [A Data Driven Fault Detection Approach with an Ensemble Classifier based Smart Meter in Modern Distribution System](#)
Soham Dutta*, Sourav Kumar Sahu*, **Millend Roy**, Pradip Kumar Sadhu. In: *Sustainable Energy, Grids and Networks (SEGN'23)*

Conference Publications

3. [Reliable Energy Consumption Modeling for an Electric Vehicle Fleet](#)
Millend Roy, Akshay Nambi, Anupam Sobti, Tanuja Ganu, Shivkumar Kalyanaraman, Shankar Akella, Jaya Subha Devi, and S A Sundaresan. In: *ACM SIGCAS/SIGCHI Conference on Computing and Sustainable Societies (COMPASS)*. COMPASS'22. Seattle, WA, USA
2. [Deep Learning Framework for Enhancing Maritime Coastal Security](#)
Millend Roy, Abhinav Gautam, Aayush Sugandhi. In: *2021 2nd IEEE International Conference for Emerging Technology (INCET)*. INCET'21. Belgaum, Belagavi, India
1. [Renewable Energy and Demand Forecasting in an Integrated Smart Grid](#)
Vishnu Vardhan Sai Lanka, **Millend Roy**, Shikhar Suman, Shivam Prajapati. In: *2021 IEEE Innovations in Energy Management and Renewable Resources(IEMRE)*. IEMRE'21. Kolkata, India

Theses

1. [Simulation and Classification of Islanding Condition Detection for an IEEE 9 bus system using PMUs and A3C based deep reinforcement learning algorithm respectively](#)
Millend Roy, Bhukya Krishna Naick, Kalyan Chatterjee. In: Undergraduate Thesis, Electrical Engineering, IIT Dhanbad, 2020 - 21.

SOFTWARE

EnCortex - Stochastic Optimization for Renewable Energy sources [Under Patent Review].

Microsoft Research India

Reinforcement Learning | Stochastic Optimization | MLOps

SKILLS

Languages Python, C++, C

Tools and Tech. Matlab, Simulink, Tableau, Docker, Git

Courses Power System, High Voltage Engineering, Control System, Signals and System, Analog and Digital Electronics, Inferential Statistics, Machine Learning by Andrew NG, Coursera Deep Learning AI Specialization, Practical Reinforcement Learning

PROJECTS

1. Autonomous Self-Driving Car Simulation

- * Graphics creation using Kivy modules in Python: serving as the environment.
- * Deep Q-Learning reinforcement techniques used with specific reward policies where the taxi (3 sensors) has a to and fro journey.

2. Seq2Seq Architecture based DL Chatbot

- * Trained on Movie-lens dataset having conversations between different people by building a Seq2Seq neural architecture.
- * Dropout regularization is used to remove any kind of overfitting and the losses are optimized using Adam optimizer.

SELECT AWARDS AND HONORS

- Convocation: Institute **Silver Medal** Holder of EE'21 batch, IIT ISM Dhanbad. Aug 2022
- Talk at COMPASS'22 presenting our paper titled "Reliable Energy Consumption Modeling for an Electric Vehicle Fleet". June 2022
- SCAI Technical Talk on Project Vasudha, internal to MSRI. April 2022
- TAB demo on Project Vasudha to the TAB Committee. Feb 2022
- TEM Talk on Smart Grid Utilities, internal to MSRI. Dec 2021
- Talk at INCET'21 presenting our paper titled "A Deep Learning Framework for Enhancing Maritime Coastal Security". May 2021
- Fully-funded Masters Offer in Electrical Engineering at UiT, Norway for Fall 2021. April 2021
- Talk at IEMRE'21 presenting my first paper titled "Renewable Energy and Demand Forecasting in an integrated Smart Grid". Feb 2021
- ASEAN India Hackathon'21 **Global Finalist**. Jan 2021
- **Winner** of the Grand Finale of Smart India Hackathon'20. 2020
- Samsung Innovation Awards **Finalists**. 2020
- **Press:** Contribution to Hurr.Ai led to nomination of Hurrey in SAP ET Innovation Awards. 2020
- SURGE'20 internship opportunity at IIT Kanpur. 2020
- SPARK'19 internship opportunity at IIT Roorkee. 2019
- SRFP'19 internship opportunity at IIT Delhi. 2019
- TU Kaiserslautern, Germany internship opportunity for the summers 2020. 2019