

# MILLEND ROY

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## EDUCATION

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**Indian Institute of Technology (IIT), Dhanbad**

2017 - 2021

*B.Tech in Electrical Engineering (EE)*

GPA : 9.51/10.0 (**Institute Silver Medalist**)

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

## WORK EXPERIENCE

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**Microsoft Research Lab India, Technology and Empowerment Lab**

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

July 2021 - Present

1. EnCortex, a Decision Management Framework for Smart Grid Utility.
  - \* Built core energy abstractions that are easily extensible.
  - \* Paired with modular optimizers including stochastic, traditional and reinforcement learning techniques.
  - \* Worked on a range of use-case scenarios:  
Carbon Arbitrage, Micro-grid Profit Maximization, Demand Matching and Bidding
  - \* Work under review in USENIX NSDI'23

2. Anomaly detection in electric vehicle's battery systems.
  - \* Modeled battery life cycles, State of Health (SoH) and rate of battery degradation.
  - \* Used clustering algorithms to group batteries of similar behaviour.
  - \* Extracted trends and seasonality across time in the patterns of battery degradation.

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

Mar 2021 - July 2021

Energy consumption modeling for an electric vehicle fleet.

- \* Direct use of primary features available before the trip
- \* Predicted Secondary non-trivial features through extensive feature engineering process
- \* Prepared a 2-stage Model using LightGBM and AdaBoost
- \* Work published in ACM COMPASS'22

**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 A3C Reinforcement Learning based Islanding Detection in IEEE 9 Bus System.
- \* Machine Learning based adaptive fault diagnosis considering hosting capacity amendment in active distribution network, an IEEE 33 Bus System (recently accepted at Electric Power Systems Research Journal).

**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](#)

- \* A [comprehensive survey](#) of islanding detection methods.
- \* Synchro-Phasor Measurement Unit based anti-islanding detection in IEEE 9 Bus System.
- \* Designed Simulation Relays using SR Flip Flop logics and programmed auto-reclosures in circuit breakers.
- \* Generated a large fault-detection Dataset for later research.

## SOFTWARE

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**EnCortex - Stochastic Optimization for Renewable Energy sources** [[Under Patent Review](#)].

*Microsoft Research India*

**Hurr.AI - an AI enabled Recommendation Engine based Learning Platform** [[Under Patent Review](#)].

*Hurrey Tech Ventures R&D*

## PUBLICATIONS

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\* - equal contribution

### Under Review

2. [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.
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)*

### Journal

1. [Machine Learning Based Adaptive Fault Diagnosis considering Hosting Capacity Amendment in Active Distribution Network](#)  
Sourav Kumar Sahu, **Millend Roy**, Soham Dutta, Debomita Ghosh, Dushmantha Kumar Mahanta. In: *Electric Power Systems Research (EPSR'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. [A 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: Bachelor's Thesis, EE'21, IIT Dhanbad.

## SKILLS

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<b>Languages</b>	Python, C++, C
<b>Frameworks</b>	PyTorch, StableBaselines, RLlib, rsome, Pyomo, scikit-learn, Keras, TensorFlow, NumPy, Pandas, SciPy, SymPy, Matplotlib, Seaborn, Plotly, Streamlit
<b>Tools and Tech.</b>	Matlab, Simulink, Tableau, Docker, Git
<b>Courses</b>	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

## SELECT AWARDS AND HONORS

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- Convocation: Institute **Silver Medal** Holder of EE'21 batch, IIT ISM Dhanbad. Aug 2022
- TEM Talk on Smart Grid Utilities and SCAI Technical Talk on Project Vasudha, internal to MSRI. Dec 2021
- Fully-funded Masters Offer in Electrical Engineering at UiT, Norway for Fall 2021. April 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
- TU Kaiserslautern, Germany internship opportunity for the summers 2020. 2019