





Dr. Nishi Parikh


Data Scientist holding a Ph.D. in Machine Learning for Material Science. Proficient in data preparation, data processing, Machine Learning algorithms and Python. Capable of creating, developing, testing and deploying highly adaptive diverse services to translate business and functional qualifications into substantial deliverables


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WORK EXPERIENCE

- Senior Engineer-Data Scientist**
Matter Motor Works, Ahmedabad
04/2024-Present
- **Developed machine learning models** to estimate and forecast the state of health (SOH) of Matter Aera battery packs, improving predictive accuracy and performance monitoring
 - **Designed and implemented data pipelines** for Battery Management System (BMS) data cleaning, preprocessing, and feature extraction, enhancing data quality for analysis and model training
 - **Created interactive dashboards** to visualize and manage data of battery packs enabling real-time insights and decision support including managing voltage deltas across battery cells
 - **Assisted in building an end-to-end ETL pipeline** using Azure services, streamlining data ingestion, transformation, and loading processes to support scalable analytics and reporting.
- Assistant Manager-Data Scientist**
Ola-Battery Innovation Centre, Bangalore
08/2023-03/2024
- **Developed predictive aging models** for Li-ion battery cells, focusing on Calendar life and Cycle life, using machine learning techniques to enhance the accuracy of battery performance forecasting.
 - **Created and optimized code** for automating data visualization and plotting, streamlining workflows and reducing the time required for experimental batch planning by 50%, which accelerated cell development timelines.
 - **Delivered Python training** to the Cell Testing team, enhancing their analytical capabilities and improving overall team productivity in data-driven decision-making.
 - Filed a **patent** titled “**Estimation of State of Health of Battery Packs in Electric Scooters Using Semi-Supervised Learning**” (Status: Filed), contributing to innovation in battery health monitoring technologies for electric vehicles.

EDUCATION

- Ph.D. - Machine Learning for Perovskites**
Pandit Deendayal Energy University, Ahmedabad
08/2019-10/2023
- **Thesis:** “*Redefining the Crystallization and Characterization of Halide Perovskites using Machine Learning*”
 - CGPA: 9.6/10 | Total Publications: 22 | Citations: 330 |h-index: 11 (As on 10/2023)
- M.Sc. - Organic Chemistry**
School of Science, Gujarat University
06/2017-06/2019
- CGPA: 8.1/10 | **Silver Medal**
- B.Sc. - Chemistry**
St. Xavier’s College, Gujarat University
06/2014-06/2017
- CGPA: 8.63/10 | **Gold Medal**

TECHNICAL SKILLS

- Programming:** Python (Advanced), R, MATLAB
- Machine Learning & AI:** Supervised & Unsupervised Learning, Semi-Supervised Learning, Deep Learning (TensorFlow, Keras, Scikit-learn, XGBoost), Predictive Modeling, Anomaly Detection
- Data Analysis & Visualization:** Pandas, NumPy, Matplotlib, Seaborn, Plotly, Tableau, Power BI
- Battery Modeling:** Aging Models, Cycle Life, Calendar Life, Performance Prediction
- Tools & Platforms:** Jupyter Notebooks, Git, SQL, Azure, Apache Spark, Databricks, MongoDB
- Research & Development:** Scientific Computing, Experimental Automation, Patent Development
- Instrument:** Electrochemical Workstation, FTIR spectrometer, UV-Vis Spectrometer, Flash Chromatography, Thermal evaporator, Nextron Micro Probe system
- Analysis:** DC and AC characterizations; X – ray diffraction; PL & TRPL, NMR, UV-Vis, FTIR techniques

SOFT SKILLS

Analytical Thinking | Problem Solving | Communication | Teamwork | Multi-tasking | Time Management

PROJECTS

Battery Health Monitoring and Prediction for EV Battery Packs (Matter)

04/2024-Present

- Built and automated ETL (Extract, Transform, Load) pipelines using Azure services and Python-based frameworks, ensuring that data from multiple sources is processed and stored efficiently.
- Integrated real-time data feeds from the BMS and created dynamic visualizations to highlight potential issues (e.g., voltage drops, temperature spikes), allowing teams to take timely actions.
- **Tools & Techniques:** Azure, Python, SQL, Machine Learning, Data Visualization, ETL Pipelines

Development of Aging Models for Lithium ion cells and battery packs (Ola-BIC)

08/2023-03/2024

- Developed **semi-empirical models** for predicting **calendar life** and **cycle life** li-ion cells
- Implemented **ML models** for estimating State of Health for battery packs in EVs
- **Tools & Techniques:** Python, Semi-supervised Co-training, SQL, Excel, Openpyxl

Advanced Machine Learning Techniques for Halide Perovskites (Ph.D.)

08/2019-12/2020

- Investigated material properties affecting **responsivity** and **detectivity** in 2D single crystal **photodetectors** using **ML techniques**.
- Predicted and analyzed **impedance response** of halide perovskite crystals using **ML and DRT** methods.
- Forecasted **photovoltaic parameters** of perovskite solar cells under extreme temperature conditions for performance optimization.
- **Tools & Techniques:** Python, Decision Tree, SVR,GBR, Random Forest, XGBoost, ANN, Ridge Regression, DRT

Synthesis, Passivation and Characterization of 3D halide perovskites (Ph.D.)

08/2019-12/2020

- Synthesized Methylammonium lead triiodide and Methylammonium lead tribromide single crystals.
- Developed a passivation technique for crystal surface using in-situ reactions, improving material stability.
- Characterized the electrical properties of these crystals via temperature-dependent Electrochemical Impedance Spectroscopy, leading to insights on surface passivation to mitigate degradation in devices.
- **Tools & Techniques:** Chemistry Synthesis, Electrochemical Impedance Spectroscopy, Material Characterization

NOTABLE AWARDS & ACHIEVEMENTS

- **PBEEE Merit Fellowship** for research at INRS, Quebec (Relinquished)
- **Swiss Government Excellence Research Fellowship** at ZHAW, Zurich (Relinquished)
- **Best Poster Award**, 3rd Gen PV in Developing World, Newcastle University, UK
- **GATE-2020:** All India Rank 2578 (24,414 candidates)
- **GPSC 2019:** Assistant Professor (Class 2, Chemistry), only 12 female candidates selected among 5000+
- **CSIR NET June 2019:** All India Rank 19 (50,000 candidates)
- **GSET 2018:** Top 6% pass rate
- **Best Oral Presentation**, International Science Symposium 2017, Christ College, Rajkot
- **Best Poster Presentation**, National Seminar, ISTAR, Vallabh Vidhyanagar (undergraduate competing with graduate students)
- **Third Prize, Best Oral Presentation**, CRPPS-2016, University of Gandhinagar (undergraduate competing with graduate students)
- **Gold Medal**, Student Research Programme 2015-16 (Top 5 students selected)

PUBLIC ENGAGEMENT EVENTS

- Speaker, "Machine Learning for Solar Cells," Perovskite Society of India & Laboratory of Advanced Synthesis and Characterization
- Delivered talk, "Hands-on Experience on EIS Measurement Under Light," to 75+ research scholars
- Conducted 10-hour training program on "Machine Learning in Material Science" for 80 postgraduate and PhD students

SELECTED PUBLICATIONS

Patent

"Method for Synthesizing Halide Perovskite Single Crystals," Indian Patent No. 427419, N. Parikh et al.

Journal

- 1.S. Pandey, N. Parikh,* et al., "Deconvoluting the Impedance Response of Halide Perovskite Single Crystals: The Distribution of Relaxation Time Method," J. Phys. Chem. C. (2023) [IF 4.13]
- 2.N. Parikh, S. Akin, et al., "Probing the Low-Frequency Response of Impedance Spectroscopy of Halide Perovskite Single Crystals Using Machine Learning" ACS Applied Mater. Inter. (2023) [IF 10.38]
- 3.S. Pandey, N. Parikh,* et al., "Machine Learning Framework for Predicting Device Performance in 2D Metal Halide Perovskite Detectors," Solar Energy (2024) [IF 6.7]
- 4.N. Parikh, M. Karamta, et al., "Is Machine Learning Redefining Perovskite Solar Cells?," J. Energy Chem. (2022) [IF 13.67]