

Parth Modi

Portfolio	Darmstadt, Germany	+49 15776233979
Education	Technical University of Darmstadt , Germany November 2020 - September 2023 Master of Science in Information and Communication Engineering Specialization: Data Science and Machine Learning Data Science-only 4.0/4.0 ; Master Thesis: 3.7/4.0; GPA: overall 3.0/4.0 Gujarat Technological University , Ahmedabad, India September 2015 - May 2019 Bachelor of Engineering in Information and Communication Engineering Specialization: Digital Signal Processing, Machine Learning GPA: overall 3.4/4.0	
Publications	P. D. Modi , K. Arshi, P. J. Kunz and A. M. Zoubir, <i>A Data-driven Deep Learning Approach for Bitcoin Price Forecasting</i> . 2023 24th International Conference on Digital Signal Processing (DSP), Rhodes (Rodos), Greece. (2023) link	
Patent	Filed a patent application for: Deep Learning-based auto Overlay Generation using CAD images - incorporation with Atlas Copco group Pvt. Ltd.	
Presentation	Technology Transfer with AI - Seminar with Dr. Michels August 2023 <ul style="list-style-type: none">Conceptualized and pitched an AI-driven startup for precise ovulation prediction, earning recognition as one of the top 3 innovative ideas in a technology transfer seminar. Link	
Projects	Personalized Cancer Diagnosis with AI with Dr. Michels August 2023 <ul style="list-style-type: none">Developed Explainable Machine Learning models with classical ML methods to classify cancer types using Gene, Variation and text feature.Compared classical ML and transformer-based methods to improve the prediction accuracy. Detailed Description AI in Medicine Challenge with Dr. Christoph Hoog August 2022 <ul style="list-style-type: none">Secured 3rd place in AI competition by implementing GANs for dataset balancing, achieving 0.85 F1 score in ECG abnormality detection with Physionet Challenge. Detailed Description	
Teaching (2017 - Present)	<i>Helping students and working professionals to get better at theoretical concepts of machine learning, data science and coding via YouTube – 3.5k community.</i> Create lectures on machine learning and data science concepts.	
Research Experience	Atlas Copco Research and Development with Dr.Zoubir October 2022 - Now Developed Neural Network-based GAN models for generating surface inspection overlays, enhancing defect detection accuracy - Master Thesis and AI Software Developer. <ul style="list-style-type: none">Investigated the role of multiple discriminators in GAN training, concluding that multi-level discriminators enhance the robustness of image generation.Developed a Generative AI model using 2D and CAD images for surface inspection, reducing process time by 80% compared to manual methods.Implemented a trained model in the production environment, enhancing operational accuracy by 90%; successfully filed a patent application to protect the proprietary technology and its algorithms.Benchmarked object detection models on AI acceleration platforms, including Nvidia Jetson, to use low-cost embedded devices as compared to high-end GPUs for inference in industries, reducing 50% hardware costs.	

- Fine-tuned and improved a U-Net deep learning model, boosting 70% structural similarity index (SSIM) between ground truth and predicted images for precise car surface inspection; effectively reducing 90% labour cost.

Data Science Seminar at Technical University of Darmstadt with Dr. Debes March 2022
Worked on Developing a Data-Driven Bitcoin Price Prediction project.

- Developed and implemented advanced deep learning models, including RNNs, LSTMs, and hybrid architectures, to accurately forecast Bitcoin prices by leveraging historical price data, trading volumes, and macroeconomic indicators.
- **Achieved a significant reduction in forecasting error, with models demonstrating up to 20% improvement in Mean Absolute Error (MAE) and Mean Squared Error (MSE) compared to traditional methods like ARIMA.** The LSTM-based model, in particular, excelled in capturing long-term dependencies and non-linear patterns in Bitcoin price data.
- **Published findings in a peer-reviewed conference (International Conference on Digital Signal Processing (DSP)),** highlighting the practical applications of deep learning in financial forecasting.

Student Research Assistant with Dr. Peter Groche November 2020 - March 2021
Worked on Designing the Optimal Algorithms for Deep Drawing.

- **Implemented optimal algorithm for image file and STL point cloud analysis using Python data structures and algorithms,** enhancing processing efficiency by 50%.
- Developed visualization tool for test data analysis of deep drawing thickness measurements, enhancing data interpretation and decision-making processes.

Student Research Assistant with M.Sc. Enno Lang April 2021 - September 2021
Worked on Developing Machine Learning models to predict wear and tear in machine parts.

- **Developed methods to synchronize time series data of different frequencies.**
- Achieved 20% reduction in MSE (Mean Squared Error) in forecasting as compared traditional methods.

Industry
Experience

Atlas Copco, Research and Development, Germany May 2022 - October 2022
Student Research Assistant and Global Industrial Internship Candidate

- **Engineered Defect Detection models using Resnet architectures, incorporating Adaptive Gamma Correction for image enhancement,** resulting in 10% improvement in test data accuracy.
- Presented comprehensive project outcome to the international presidential panel at company headquarters, detailing a 15% increase in efficiency and savings of €300K annually through strategic process improvements.

Spryfox, Darmstadt, Germany October 2021 - March 2022
Data Science Intern

- **Trained a machine learning model for predicting pet diseases using Logistic Regression and XGBoost, improving age-based risk assessment accuracy by 20% and breed-based by 10% for a pet insurance provider client.**
- Engineered an advanced autoencoder-based defect detection system for textile images, achieving a 20% improvement over existing methods and **successfully implementing it in production environments.**

Other
Experience

Founder of Robotics Club at university clubs January 2019
Smart India Hackathon, Finalist August 2018

Awards

2021-2022 Germany Student Scholarship (top 2%) – \$4,000
2019 Student Startup and Innovation Council Ideathon Runnerup – \$2,500
2019 Fastest Growing Machine Learning Youtube Content Creator – \$500
2017 TCS Coding Challenge Qualifier

Community
Involvement

DAAD Info Session 2022, University Representative, Taiwan April 2022
Technical University of Darmstadt Department Orientation Program, Mentor October
2021
Event Manager at Robotics Club, Volunteer March 2019
Blind Student Exam Writer, Volunteer September 2018
Gujarat Technological University Regional Science Fair, Volunteer April 2017

References

Dr. Dominik Michels

Professor of Computer Science at TU Darmstadt, **Email:** michels@cs.tu-darmstadt.de, **Tel:** +49 (6151) 16-20802.

Dr. Abdelhak M. Zoubir

Professor and Head of Department Signal Processing at TU Darmstadt, **Email:** zoubir@spg.tu-darmstadt.de, **Tel:** +49 (6151) 1621341.

Dr. Peter Groche

Head of Production Engineering, Mechanical Department, at TU Darmstadt, **Email:** groche@ptu.tu-darmstadt.de, **Tel:** +49 (6151) 1623143.