# IOAN STELIAN LUNGU

## AI/ML Engineer | Production ML Systems | Published Researcher

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**AI/ML Engineer specializing in production-ready machine learning systems for manufacturing and automotive applications.** Published researcher with 3 peer-reviewed papers in ACTA TECHNICA NAPOCENSIS (2025) focusing on Graph Convolutional Networks and AI-driven vehicle systems. Proven expertise in deploying production ML models achieving 99.77% accuracy ($R^2$ = 0.9977) for real-time telemetry applications. Combines deep theoretical knowledge in ML/DL with hands-on experience in data engineering, MLOps workflows, and enterprise system integration. Multidisciplinary background spanning software engineering, electronics, and systems optimization enables bridging the gap between data science and manufacturing reality.

| $R^2$ 0.9977 | 3 Papers | Real-Time |
|:---:|:---:|:---:|
| Production GCN Model Accuracy | Published Research 2025 | ML System Deployment |

## RESEARCH & PUBLICATIONS

### Graphical Convolutional Networks Based Regenerative Brake Energy Prediction System for Solar-Powered Electric Vehicles

**First Author** | ACTA TECHNICA NAPOCENSIS, Volume 62, Number 1, 2025
- Architected and deployed production-ready GCN model for real-time energy prediction in automotive applications
- Implemented complete ML lifecycle: data collection → preprocessing → model development → validation → deployment
- Designed automated data preprocessing pipeline handling mixed-sign parameters and temporal sequences
- Achieved $R^2$ **score of 0.9977** and **RMSE of 0.0367 kW** demonstrating production-grade accuracy
- Multi-layer GCN architecture processing complex vehicle telemetry data for predictive analytics

### AI-Driven Power Consumption Analysis for Solar Electric Vehicles

**Co-Author** | ACTA TECHNICA NAPOCENSIS, 2025
- Applied ML/DL techniques for energy efficiency optimization in automotive systems
- Developed predictive models integrating multiple sensor data sources for power management
- Implemented data-driven approaches for vehicle energy system optimization

### Graph Neural Network Model for Predicting Electric Vehicle Battery Voltage

**Co-Author** | ACTA TECHNICA NAPOCENSIS, 2025
- Designed graph-based neural network architectures for battery management systems
- Applied advanced DL techniques to complex IoT data from vehicle sensors
- Contributed to neural network optimization and hyperparameter tuning

# PROFESSIONAL EXPERIENCE

## ML/AI Engineer - Telemetry & Data Systems
*January 2024 - Present*

Solis UTCN, Cluj-Napoca

- **Developed production ML models:** Architected and deployed Graph Convolutional Network achieving 99.77% accuracy for real-time energy regeneration prediction in electric vehicles
- **Built end-to-end data pipelines:** Designed and implemented data preprocessing workflows handling complex vehicle parameter analysis, feature engineering, and temporal data processing
- **Real-time system integration:** Integrated ML models with vehicle telemetry systems enabling live data collection, processing, and predictive analytics
- **MLOps implementation:** Established model versioning, validation pipelines, and monitoring systems for production ML deployment
- **Cross-functional collaboration:** Worked with mechanical, electrical, and systems engineering teams to integrate AI/ML solutions into vehicle architecture
- **Research to production:** Translated theoretical GCN research into deployed production system with documented performance metrics

## Data Analytics & Process Automation Intern
*July 2023 - January 2024*

CARGO-PARTNER, Cluj-Napoca

- Developed automated workflows using Python scripts for document processing and data extraction from enterprise systems
- Created analytical dashboards and reports for logistics operations using data visualization tools
- Worked with enterprise management systems (ERP-like) for data integration and process optimization
- Improved operational efficiency through automation reducing manual processing time by 40%

# KEY ML/AI PROJECTS

## Facial Emotion Recognition System using CNN | Bachelor Thesis

*April 2024 - September 2024*

- Architected CNN-based emotion recognition system using InceptionV3 architecture with custom optimization layers
- Achieved real-time inference performance suitable for production deployment in marketing and healthcare applications
- Implemented using **Python, TensorFlow, OpenCV** with focus on model optimization and deployment readiness
- Demonstrated practical applications across multiple domains: customer experience analytics, security systems, healthcare monitoring

## Precision Agriculture Platform with Satellite Data Integration

*November 2023 | SAS-UTCN Business Ideas Competition*

- Built full-stack ML application integrating **NASA/ESA satellite data** using Google Earth Engine API
- Implemented data engineering pipelines processing multi-spectral satellite imagery for soil quality analysis
- Developed algorithmic decision systems for crop optimization using **Jupyter Notebook, Python, Pandas**
- Deployed cloud-based solution demonstrating big data processing and API integration skills

## Bosch Future Mobility Challenge - Autonomous Driving Systems

*November 2022 - March 2023*

- Contributed to autonomous vehicle systems development using **computer vision and sensor fusion** techniques
- Implemented path planning algorithms and navigation systems integrating multiple sensor data streams
- Collaborated in agile team environment with CI/CD workflows and version control best practices

# TECHNICAL SKILLS

## ML/DL Frameworks & AI

PyTorch | TensorFlow | Scikit-learn
GCN/GNN | CNN/DNN | InceptionV3

## Programming & Software Engineering

Python (Advanced) | C++ (Performance)
SQL | Git/Version Control | API Design

## Data Engineering & Big Data

Pandas & NumPy | Jupyter Notebook
Data Pipelines | Feature Engineering
ETL Workflows

## MLOps & Infrastructure

Docker | Linux (Fedora) | CI/CD
Database Management | Model Deployment

## Domain Expertise

IoT Systems | Real-time Processing
Automotive/Manufacturing | Sensor Data Analysis
Time-series Prediction

## Engineering Tools

MATLAB | Microcontrollers
Embedded Systems | Data Visualization

# EDUCATION

### Master's Degree in Engineering and Quality Management

Faculty of Industrial Engineering, Robotics and Production Management, Cluj-Napoca

*2024 - Present*

Focus: Advanced engineering principles, quality systems, production optimization, manufacturing processes

### Bachelor's Degree in Economic Engineering

Faculty of Electronics, Telecommunications and Information Technology, Cluj-Napoca

*2020 - 2024*

Specialization: Electrical, Electronic and Energy Field | Software development, systems analysis, technical optimization

# CERTIFICATIONS & ACHIEVEMENTS

**ISC² Certified in Cybersecurity (CC)**

*February 2025*

Security principles, network security, incident response

**English Language Certificate (B2)**

*May 2024*

**MINOAN ROBOTSPORTS - 3rd Place Rally**

*April 2023*

Autonomous navigation, control algorithms, sensor integration

**NASA Space Apps Challenge**

*September 2023*

Satellite data processing, cloud computing applications

# WHY BOSCH CLUJ?

I am excited about the AI/ML Engineer position at Bosch Cluj because it represents the perfect intersection of my research expertise, production ML experience, and passion for applying AI to real-world manufacturing challenges. My published research demonstrates deep theoretical understanding of advanced neural network architectures, while my telemetry work proves I can deploy production-ready ML systems with measurable impact. Having previously contributed to the Bosch Future Mobility Challenge, I understand Bosch's commitment to innovation and excellence. I am eager to bring my multidisciplinary approach—combining software engineering, electronics knowledge, and systems thinking—to develop scalable ML solutions that drive manufacturing efficiency and product quality. The opportunity to work with big data platforms, implement MLOps workflows, and integrate AI with enterprise systems (ERP/MES/IoT) aligns perfectly with my skills and career aspirations. I am ready to contribute from day one and grow alongside Bosch's AI/ML initiatives.