Philip Modayil

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Education

2024. **M.S.c. Automation and Robotics**
TU Dortmund
Dortmund – Germany

2019. **B.Tech. in Electrical and Electronics Engineering**
College of Engineering
Trivandrum (KTU)
Trivandrum – India

Skills

- Programing: Python / Numpy / C++ / Eigen3
- AI: PyTorch / Reinforcement Learning
- Data : PySpark / DataBricks

Languages

- English: C2
- German: A2
- Malayalam: Native

Experience

Oct. 2024 – Present. **Research Assistant**
DT/IPL, TU Dortmund
Potential Curve Prediction in Coupled Surface Microstrips:

- RL + GA hybrid algorithm to predict the shape of the potential curve in coupled microstrips.

Multimodal Agentic Chatbot Assistant for PCB Designers:

- Custom dataset fine-tuning for PCB domain, and diagram & circuit analysis.
- RAG capability, ML model and simulation tool invoking.
- Simulation result inference and design automation with Chain of Thought.

Jan. 2024 – Jun. 2024. **Master Thesis**
DT/IPL, TU Dortmund
Potential Curve Prediction in Single Surface Microstrips:

- RL + GA hybrid algorithm to predict the shape of the potential curve in a single surface microstrip.
- **10x performance** achieved with pure C++ implementation.
- **Publication**: *AI-based Hybrid Approach (RL/GA) for Calculating the Characteristic Parameters of a Single Surface Microstrip Transmission Line*

May. 2022 – Sep. 2024. **Data Scientist - Werkstudent**
Wilo SE
Smart Sensor System for Pump Monitoring & Predictive Maintenance:

- Developed algorithms for real-time feature extraction and analysis in pyspark.
- Implemented a predictive ML model (LOESS) on the extracted features to trigger maintenance alerts.

Projects

Mar 2025. **ragyphi** | *RAG, ollama, YOLO*
Contextualised data for efficient retrieval. ragyphi
May 2024. **Drone Image Analysis** | *VLM, Streamlit*
VLM-based image analysis system to automate inspections in hard-to-reach areas for the 2024 BMW Innovation Challenge (Dingolfing).