Philip Modayil

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https://pvmodayil.github.io/

philipmodayil

pvmodayil

Skills

Python, C++, PyTorch, Reinforcement Learning, Genetic Algorithms, LLM, RAG, Computer Vision, YOLO, Robotics, DataBricks, PySpark

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

Languages

- English: Fluent, C2
- German: Basic, A2 - improving

Experience

Oct. 2024 – Present. **Research Assistant**
DT/IPL, TU Dortmund

- Designing a hybrid RL + GA algorithm for predicting potential curves in coupled surface microstrips, enabling more efficient PCB design.
- Developed a multimodal AI assistant for PCB designers, integrating fine-tuned LLM, image analysis, and simulation tool integration with Chain of Thought prompting for intelligent PCB design automation.

Jan. 2024 – Jun. 2024. **Master Thesis**
DT/IPL, TU Dortmund

- Designed and implemented a hybrid RL + GA algorithm for predicting potential curves in single surface microstrips, enabling more efficient PCB design.
- Achieved **10x** speed-up through C++ GA 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

- Developed real-time feature extraction and predictive maintenance algorithms for smart pump systems using PySpark and DataBricks.
- Implemented LOESS-based ML models for proactive system monitoring and fault detection.

Projects

Mar 2025. **ragyphi** | *RAG, ollama, YOLO*
Developed a RAG-based system using Ollama and YOLO for contextualized data retrieval and intelligent information extraction. ragyphi

May 2024. **Drone Image Analysis** | *VLM, Streamlit*
Built a Visual Language Model (VLM) powered inspection system in Streamlit to automate image analysis for hard-to-reach areas. Submitted to BMW Innovation Challenge 2024.