Zeyuan Sun

ML Engineer/Software Developer

Contact

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Languages

Chinese
German
English

Education

- Master of Science in Electrical Engineering
  TU Darmstadt | Darmstadt.
  April 2018 – March 2023
  - Specialization in Control Engineering and AI.
  - Thesis with topic on: Self-Expanding Neural Networks in Reinforcement Learning .
  - Grade of the thesis: 1,3.
- Bachelor of Science in Electrical Engineering
  Universität Siegen | Siegen.
  October 2015 – November 2017
  - Fundamentals of Electrical Engineering.
  - Thesis on the Development of a Test Framework for Automated Integration and Fault Injection Testing.
  - Final grade 2,3.
- Bachelor of Science in Electrical Engineering
  Qingdao University of Science and Technology | Qingdao.
  September 2012 – June 2015
  - Basic Courses in Mathematics and Physics.
  - Basic Courses in Control Theories.
  - German courses.

Experience

- **Sotec** | Ostelsheim.
  January 2024 – December 2024
  Software Developer
  - Development of a Golang script for comparing software packages across different devices and setting up the CI/CD test pipeline for this script on GitHub.
  - Simulation of household energy consumption using an ML-based method.
  - Implementation of MPC in a building energy management system.
  - Development of two LLM-based smart solutions (Agent and Function Calling) for retrieving and analyzing SQL database information using natural language.
  - Development of reinforcement learning-based and deep learning-based optimization methods for production.
  - Exploration of various time-series prediction algorithms.
  - Code review for a deep learning-based quality control (YOLO) using computer vision.
  - Certified GCP ML Engineer.
  - Documentation of work on GitHub and GCP Workbench.
- **IAS TU Darmstadt** | Darmstadt.
  October 2022 – October 2023
  Collaborator
  - Adapting a Mujoco model for the Humanstance simulation.
  - Development of two hyperparameter search frameworks using different machine learning methods.
  - Further development of a Humanstance controller in Python based on previous work in Matlab.
  - Customization and further development of the reinforcement learning framework GAIL for the TAM_irl project.
  - Documentation of work on GitHub.
- **TU Darmstadt** | Darmstadt.
  October 2021 – March 2022
  Research Assistant
  - Teaching Assistant in the field of NLP.
  - Creation of exercises and exam tasks.
  - Python code review and exam grading.

Profile

I studied Electrical Engineering at TU Darmstadt with specializations in Control Engineering and AI.

In my thesis, I worked with a new method for expanding the size of an MLP in the context of RL using Policy Gradient. As a result, a trained policy, represented by an MLP of appropriate size, can successfully solve the control problem of Cart-Pole-Swing-Up.

I also contributed to a research project where we collaborated with neurologists to investigate, using AI-assisted methods, how humans maintain stability in an upright stance. The control system was simulated using a Humanstance model in Mujoco. Through the IRL framework Generative Adversarial Imitation Learning (GAIL) and Bayesian Hyperparameter Optimization, we studied the factors that play a crucial role in maintaining human body stability.

In my role as softwaredeveloper, I am primarily responsible for implementing ML methods in industry, including, for example, applying MPC to an optimization problem for household energy consumption and using Dynamic Programming to optimize the production process for iron casting. Additionally, I am actively involved in various research projects, such as exploring the Google model Timesfm for time series prediction and developing agents/apps with Gemini. Currently, I have a strong interest in Gen-AI.

Experience

- **ISH Ingenieursozietät GmbH** | Kreuztal.
  March 2017 – November 2017
  Software Developer
  - Development of a test framework in Python that enables the implementation of test automation.
  - Development, setup, and maintenance of test-related devices.
  - Creating and maintaining databases.
  - Creating and maintaining documentation for test-related hardware, software, and test results.

Skills

- ●●●●● Machine Learning, Deep Learning and Reinforcement Learning
- ●●●●○ State control, nonlinear control
- ●●●●● Model Predictive Control (MPC)
- ●●●●● Python-libraries like Tensorflow, Keras, PyTorch, Numpy
- ●●●○○ Robotics
- ●●●○○ Linux
- ●●●○○ Matlab
- ●●●●○ Golang
- ●●●●○ GCP Platform
- ●●●●○ Github
- ●●●○○ MS Office

References

Alap Kshirsagar
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Rupert Mitchell
Machine Learning Lab at TU Darmstadt Ltd.
PhD Student
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- I was part of the tam_irl project under the leadership of Dr. Kshirsagar. The objective of the project is to investigate human upright posture using AI methods.
  Based on Mr. Mitchell's work, I wrote my thesis on the topic *Expanding Method for Neural Networks in Reinforcement Learning*
- **During my work as a software developer, I was able to design various ML solutions. Through my studies and work experience, I have gained a strong understanding of ML. Additionally, I have hands-on experience with RAG and agent design (both using Gemini on GCP), as well as with common tools and principles in software development, such as VS Code, GitHub, Docker and clean coding principles. I am particularly fascinated by the further development of LLMs(Hugging Face/Ollama).**
- I am always motivated to deepen and expand my knowledge, and I am also committed to researching technical problems. During my studies at TU Darmstadt, in addition to acquiring technical knowledge, I developed a structured approach to work, excellent communication skills, teamwork abilities, as well as strong problem-solving and analytical skills.