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Experience

10.2020-Present

OBO Bettermann GmbH
Industrial Engineer
• Implementation of Industry 4.0 techniques for smart factory.
• Data visualization and exploration
• Designing machine learning models for predictive maintenance.

10.2019-09.2020

Research assistant at the Fachhochschule Südwestfalen Soest, Germany
• Designing and testing reinforcement learning and deep learning algorithms.
• Data exploration and visualization using Pandas, Matplotlib, etc.
• Worked with the company Bültmann GmbH, where the task was to analyse their production dataset using pandas and use machine learning algorithms to find ways to improve the production efficiency.

• **Software used: ROS/Gazebo, Python | Deep Learning Framework: Pytorch**

07.2017-08.2017

Internship – Ashok Leyland Ltd (Research & Development Centre), Chennai, Indian
• A frame assembly with CATIA was designed for a four-wheeled heavy vehicle to withstand the weight of the engine, radiator, transmission, and exhaust system.
• Run the vibration analysis of the assembly with ENOVIA to analyze the frequency of vibration based on real world simulation.

Education

04.2018 – 09.2020

Fachhochschule Südwestfalen, Soest, Germany
M.Sc. Systems Engineering & Engineering Management
Focus Area: Advanced Control Technology, Systems Engineering (Machine Learning and Reinforcement Learning), Advanced Production Engineering, International Project Management.

2013 – 2017

Sri Sairam Engineering College, Chennai Tamilnadu, India
*Bachelor's in Mechanical Engineering (CGPA - **1.8**)*

Master Thesis:

Jul 2019-Sept 2020

Fachhochschule Südwestfalen, Soest, Deutschland
Coordination of two Universal Robots (UR5) in ROS/Gazebo with reinforcement learning (artificial intelligence) algorithms like Proximal Policy Optmization (PPO)
• **Task 1**: Training a UR5 robot with Robotiq 85 gripper to reach random targets using reinforcement learning, and then testing it additionally to reach new targets.
• **Task 2**: Coordination of two UR5 robots with Robotiq 85 grippers to reach a common target position using reinforcement learning, so that one robot can transfer an object to another.
• Once the robots are trained properly, they can easily be generalized to similar tasks.

• State-of-the-art Proximal Policy Optimization (PPO) is used as the RL agent for the robot environment.
• **Software used: ROS/Gazebo, Python | Deep Learning Framework: Pytorch**
Grade – 1.0

Projects:

10.2020-11.2020

Identifying Pneumothorax Disease UNet
• A UNet was developed using Convolution Neural Networks to learn the chest X-ray images provided by the Society for Imaging and Informatics in Medicine (SIIM).
• The X-ray images were pre-processed using image augmentation libraries and then given as input to the model.
• **Software used: Python | Frameworks: Pytorch, Albumentations**

02.2019-03.2019

Controlling a mobile robot (Turtlebot3) in ROS to reach random target positions using Reinforcement Learning (AI)
• The mobile robot learns to reach a random target position using various Reinforcement Learning algorithms such as Q-Learning, Actor-Critic, and Proximal Policy Optimization (PPO). If the mobile robot is trained to sufficiently random targets, it generalizes to reach new targets on which it is never trained to reach on.
• **Software used: ROS/Gazebo, Python | Deep Learning Framework: Pytorch**

11.2018-02.2019

Motion control of the Peristaltic Sorting Machine (PSM) using Reinforcement Learning (AI)
• To develop a Reinforcement Learning agent for the actuator of the PSM machine to reach random parcel positions in the most efficient way.
• Advantage Actor-Critic (A2C) was used as the RL agent for the PSM Environment
• **Software used: Python | Deep Learning Framework: Pytorch, Keras**

10.2019-03.2020

Design a robot station using AutoCAD Inventor to assemble a UR5 robot
• Design of a robot station for my laboratory in the Fachhochschule Südwestfalen for the assembly of a UR5 robot for research purposes.

04.2018-08.2018

Project plan for the construction of a Power Plant (international project management)
• To develop a project plan for the construction of a power plant (international project management)
• **Software used: MS Project**

04.2018-08.2018

***Non-linear controller for a Bioreactor System (*Advanced Control Technology)**
• To develop and design a linear and non-linear controller that can control the non-linearity of a bioreactor system.
• **Software used: Matlab/Simulink**

04.2018-08.2018

Modelling and Simulation of Mechanical Systems
• Estimation and calculation of pressure loads, thermal loads and other factors for a thin concrete fin with a variable rectangular cross-section.
• **Software used: Matlab/Simulink**

07.2016-04.2017

Bachelor Thesis - Prosthetic-Attachment in Four Wheelers for People with Disabled Legs
• Design and manufacture of a prosthetic attachment in a four-wheeler that can help people with disabled legs to ride a four-wheeler.
• **Software used: SolidWorks, ANSYS, CATIA**

Accomplishments:

Jun 2020	• Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization (Coursera)
Jun 2020	• Structuring Machine Learning Projects (Coursera)
May 2020	• Deep Neural Networks with Pytorch from IBM (Coursera)
Feb-May 2020	• Reinforcement Learning Specialization from University of Alberta and Alberta Machine Learning Intelligence Institute (Coursera)
Apr-May 2020	• Neural Networks and Deep Learning offered by deeplearning.ai (Coursera)
Feb-March 2020	• Python Programmer (DataCamp)
Feb-March 2020	• Python Bootcamp: Python3(Udemy)
Dec 2019	• Using OpenAI with ROS (The Construct)
Dec 2019	• TF ROS 101 (The Construct)
Dec 2019	• ROS Control 101(The Construct)
Jan 2017	• Professional in Product Design – CADD Centre Chennai

Skills:

Technical	• ROS (Robotic Operating System) (Good) • Python (Good) • Spyder (Good) • Jupyter Notebook (Good) • MATLAB/Simulink (Good) • AutoCad Inventor (Good) • CATIA (Good) • MS Project (Good) • MS Office (Good)
Organisational	• Loyal • Optimistic • Creative
Languages	• English (C1) • German (Goethe, B1) • Hindi, Gujrathi, Urdu, Tamil (Native)