Murtaza Khuzema Basuwala

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Experience

10.2020 - *Present*   **OBO Bettermann Group**
Industrial Engineer
- **Objectives:** Industry 4.0, Predictive Maintenance, Data Visualization and Exploration, Machine Learning, Deep Learning, AI.
- **Tools: ViewSystems, Python, Schaefler Smart Utility, OPC-UA Interface.**

10.2019 – 09.2020   **Student Research Assistant at Fachhochschule Südwestfalen Soest, Germany**
- **Objectives:**
  • Design and test reinforcement learning, deep learning, and machine learning algorithms.
  • Worked with the company Bültmann GmbH, to analyse their data and improve their production using machine learning.
- **Tools and Libraries: Python, Pandas, Pytorch, Numpy, Matplotlib, Seaborn, Scikit-Learn, etc.**

07.2017 – 08.2017   **Intern at Ashok Leyland Ltd (R&D Centre), Chennai, India**
- **Objectives:**
  • A four-wheeler assembly was designed for a heavy vehicle to withstand the weight of the engine, radiator, transmission, and exhaust system.
  • Run the vibration analysis of the assembly to analyse the frequency of vibration based on real world simulation.
- **Tools and Libraries: CATIA, Enovia**

Education

04.2018 – 09.2020   **Master of Science in Systems Engineering and Engineering Management (CGPA-1,6)**
Fachhochschule Südwestfalen, Soest, Germany
Focus areas: Machine Learning, Deep Learning, Reinforcement Learning, Advanced Production Engineering, Modelling and Simulation of Mechanical Systems.

Other areas: International Project Management, Integrated Management and Business & Engineering.

08.2013 – 05.2017   **Bachelor's in Mechanical Engineering (CGPA – 1,8)**
Sri Sairam Engineering College, India
Focus areas: Machine design, Production Engineering, Kinematics and Dynamics of Machines, Operations Research.

Master Thesis

12.2019 – 09.2020   **Coordination of two Universal Robot (UR5) in ROS/Gazebo with Reinforcement Learning algorithm – Proximal Policy Optimization (PPO) – Grade – (CGPA – 1,0)**
Fachhochschule Südwestfalen, Soest, Germany
- **Objectives:**
  - Developing robot environment for training the RL agent.
  - Training a UR5 robot with Robotiq 85 gripper to reach random targets using reinforcement learning, and then testing it additionally to reach new targets.
  - 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.
- **Tools and libraries:** Python, PyTorch, ROS/Gazebo

Projects

10.2020 – 11.2020   **Identifying Pneumothorax Disease using UNet – CNN (Deep Learning)**
  - 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.
- **Tools and libraries:** Python, Pandas, PyTorch, Scikit-Learn, Matplotlib, Numpy, Seaborn, Albumentations

09.2015 – 03.2018   **Controlling a mobile robot (Turtlebot3) in ROS to reach random target position using Reinforcement Learning**
  - 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 on sufficiently random targets, it generalizes to reach new targets on which it has never been trained on.
- **Tools and libraries:** Python, PyTorch, ROS/Gazebo, Matplotlib, Numpy

09.2015 – 03.2018   **Motion Control of a Peristaltic Sorting Machine (PSM) using Reinforcement Learning**
  - To develop a reinforcement learning agent for the actuator of the PSM machine to reach random parcel position in the most efficient way.
  - Advantage Actor.Critic (A2C) was used as the RL agent for the PSM environment.
- **Tools and libraries:** Python, PyTorch, Numpy, Matplotlib

09.2015 – 03.2018   **Non-liner controller for a Bioreactor System (Advanced Control Technology)**
  - To develop and design a linear and a non-linear controller to control the non-linearity of the bioreactor system.
- **Tools and libraries:** Matlab/Simulink

Certifications

1. Deep Learning Specialization, *deeplerning.ai, Coursera*
   Focus Area: *Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization, Neural Networks and Deep Learning, Structuring Machine Learning Projects, Sequence Models, Convolution Neural Networks.*
2. Reinforcement Learning Specialization, *Alberta Machine Intelligence Institute, Coursera*
   Focus Area: *Sample-based Learning Methods, Prediction and Control with Function Approximation.*
3. Deep Neural Networks with Pytorch, *IBM Coursera*
4. Python Programmer, *Datacamp*
5. Python Bootcamp: Python 3, *Udemy*
6. Using OpenAI with ROS, *The Construct*
7. TF Ros 101, *The Construct*
8. ROS Control 101, *The Construct*

Skills

- **Skillset:** Machine Learning, Deep Learning, Deep Reinforcement Learning, Robotic Programming, Advanced Production Engineering.
- **Programming Languages:** Python, MATLAB & Simulink, basics of SQL and R.
- **Python Libraries**: PyTorch, TensorFlow, Keras, Gym, Scikit-Learn, XGBoost, Numpy, Pandas, Plotly, Seaborn, Matplotlib, Flask, Streamlit, Rospy.
- **Tools and Technologies:** ROS, Microsoft VS Code, Spyder, PyCharm, Sublime Text, Jupyter Notebook, GitHub, AutoCAD, Catia V5, MS Office, MS Project, MS Publisher.
- **Operating Systems:** Windows, MacOS, Linux (Ubuntu).
- **Interpersonal Skills:** Public speaking, Team player, Adaptability.
- **Languages:** English, German (B1), Hindi, Tamil, Guajarati, Urdu, Arabic (writing & reading).

Hobbies

- Painting, Cricket, Reading, Running.