

Murtaza Khuzema Basuwala

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Experience

- 03.2021 - Present** **ViewSystems GmbH**
Machine Learning Engineer and Software Developer
- **Objectives:** Software Development, Providing AI solutions using Machine Learning and Deep Learning, Data Cleaning, Feature Engineering, Industry 4.0, Predictive Maintenance, Data Visualization and Exploration.
 - **Tools:** Python, C#, SQL
- 10.2020 - 02.2021** **OBO Bettermann Group**
Industrial Engineer
- **Objectives:** Industry 4.0, Predictive Maintenance, Data Visualization and Exploration, Machine Learning, Deep Learning, AI.
 - **Tools:** IndustryView SF, Python, Schaeffler 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 on a project with Bültmann GmbH, to analyse the data of their pre-peeling machine and improve its production using machine learning.
 - **Tools and Libraries:** Python, ROS, Pandas, PyTorch, OpenCV, Numpy, Matplotlib, Seaborn, Scikit-Learn, etc.

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 Control Technology, Advanced Production Engineering.
Other areas: International Project Management, Integrated Management and Business & Engineering, Modelling and Simulation of Mechanical Systems.
- 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)**
(CGPA – 1,0)

Fachhochschule Südwestfalen, Soest, Germany

- **Objectives:**
 - 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.
 - 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, OpenCV, 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 X-ray images of the chest provided by SIIM to detect pneumothorax disease.
- 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, OpenCV, Scikit-Learn, Matplotlib, Numpy, Seaborn, Albumentations

09.2015 – 03.2018 **Learning a mobile robot (Turtlebot3) in ROS to reach random target positions using Reinforcement Learning**

- To make a mobile robot learn to reach random target positions using various reinforcement learning algorithms such as Q-Learning, Actor-Critic, and Proximal Policy Optimization (PPO).
- After the mobile robot is trained on sufficiently random targets, it generalizes to reach unseen target positions.
- **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-Linear 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, *deeplarning.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, C#, C++, ROS, SQL, MATLAB & Simulink.
- **Python Libraries:** PyTorch, TensorFlow, Keras, Gym, Scikit-Learn, XGBoost, Numpy, Pandas, Plotly, Seaborn, Matplotlib, Flask, Streamlit, Rospay.
- **Tools and Technologies:** Microsoft Visual Studio, ROS, Microsoft Visual Studio Code, Spyder, PyCharm, Anaconda, Sublime Text, Jupyter Notebook, GitHub, AutoCAD, Catia V5, MS Office, MS Project.
- **Operating Systems:** Windows, MacOS, Linux (Ubuntu).
- **Interpersonal Skills:** Public speaking, Team player, Adaptability.
- **Languages:** English, German (B1), Hindi, Tamil, Gujarati, Urdu, Arabic.

Hobbies

- Reading, Running, Badminton, Cricket.