ASJAD SOHAIL

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EDUCATION

MS University of Paderborn, Computer Science April 2018 – August 2021
Thesis: *"Autonomous Robot Navigation in Real Environment using Reinforcement Learning"*
Advisor: Prof. Dr. Bärbel Mertsching
Majored in Intelligence & Data

Studies focused on Autonomous Navigation, Data Visualization and Machine Learning. Created and tested autonomous navigation in simulation environments using deep learning as well as computer networking.

BE NED University of Engineering and Technology, Computer & Information Systems Engineering Jan 2013 – Dec 2016
Graduated Summa Cum Laude
Advisor: Prof. Dr. Muhammad Ali Ismail
Majored in Computer Systems Security

Participated in team projects directed towards real world applications. Honorary student in the final semester. Served as a Research Assistant in High Performance Computing Center (HPCC). Lead the Final Year Project and the departmental football team.

PROFESSIONAL EXPERIENCE

GETLab, University of Paderborn August 2020 to March 2021
Research Assistant

- Gazebo simulation environment training to BS Electrical Engineering students.
- Project management of BS Electrical Engineering students.
- Research on Reinforcement Learning algorithms for agents with infinite action spaces.

Diebold Nixdorf, Paderborn June 2018 to May 2020
Research & Innovation – Software Engineer

- Support in the development, operation, and demonstration for the innovation lab.
- Familiarization with new technologies and programming languages.
- Implementation of front-end and back-end of banking applications. Transaction, logging record and security of the user. (Angular, React)
- Back-end re-structure for banking transaction. (Java to Golang)

- USB event detection in the Innovation Lab. Events saved on the Splunk server. (Python)
- Android banking applications re-implementation for the blind with speech support. (Java)

Gaditek, Karachi Dec 2016 to Feb 2018
Research & Development – Software Engineer

- IPTables to provide security to the users using the servers of VPN. Making only certain ports and IPs available. (Linux firewall)
- Squid and SSL Proxy configuration in the Linux servers which is used in the application.
- Using Logstash and Elasticsearch to keep the logs of the customers.
- VPN on DD-WRT firmware in router using C++, JavaScript, Python and Bash. CSS, HTML, JavaScript are used to make pages when the user installs the application from the server. C++ is used to populate the pages as it checks for the firmware if it is either DD-WRT or TOMATO. Python script runs to install the applet while bash is used for operations in the firmware.

Research Assistant, NEDUET Karachi Dec 2015 to Dec 2016
Research & Innovation – Software Engineer

- Optimizing Big Data processing using OpenDaylight projects.
- Reviewing research papers.
- Hadoop and Spark clusters management and creation. Research work on SDN (OpenDaylight and its alternatives)

IBM, Karachi June 2015 – July 2015
Internee

- Responsible for making a tape record project using PHP and MySQL to keep track of what were being used and what was only in storage.

PROJECTS

Autonomous Robot Navigation in Real Environment using Reinforcement Learning
Implementation of Deep Deterministic Policy Gradient (DDPG) algorithm for autonomous navigation in a cluttered environment. The training was carried out in a simulation environment using Gazebo simulator, LiDAR sensor is used to collect the distances with objects. The testing was carried out in the university lab and its corridors. (Python 3, TensorFlow 2, ROS 2)

Chat Bot
Datasets can be uploaded via a UI provided to the user. The user can perform few classification machine learning techniques and see the graphs. Speech to text (NLP) is implemented for uploading, managing the datasets and the users. (Java Spring, Angular, Python)

Dataset Visualization
Built a GUI using TK toolkit for python which takes in dataset and applies machine learning techniques based on the columns identified. The output is a visualization graph, which gives more information about the dataset. The application does not perform well enough on big datasets, as it was only programmed to test multiple classification algorithms. (Python 3)

Fact Checker
Built a corpus driven fact checking engine (NLP), which returns confidence values -1 (fact is false) and 1 (fact is true) given a fact from DBpedia. (Python 3)

Optimizing Big Data Processing using Software Defined Networking
Optimized packet execution time and network traffic using SDN (OpenDaylight) in a multi-node Hadoop and Spark setup. Mininet and ODL are connected with the multi-node Hadoop and Spark. Mininet is used to manage the network structure.

TV Shows Recommendation System
A system built to gives recommendation of tv shows based on the likeness of user w.r.t genres. Content-based and Collaborative filtering are implemented into the system, pre-processing is done using Numpy and Pandas. The dataset of anime shows was extracted from Kaggle. (Python 3)

LSTM based Patient Treatment Recommendation System
Used TensorFlow, Numpy and Pandas for feature engineering of medical data and model building for recommendation of treatment ICDs. Sequences of ICDs helps in identifying the diseases, the system shortens the sequences. (Python 3)

Flask Based Chat Application
Utilized Flask, ChatterBot and Docker for building REST API based chat application. The chat is only carried out between two users. (Python)

Bank Application
Bank application as a group project is implemented where user is able to make transactions (withdraw, deposit). A separate admin interface to manage the users. (C++)

Acidic 2D
An android application where alien cats have invaded the earth. An arcade game to shoot them down with different lasers for different types of cats. The sprites were created by hiring a professional digital artist. (Java)

PUBLICATIONS

Journal Publications

Asjad Sohail, Muhammad Ali Ismail and Muhammad Wajahat, *"Optimizing Big Data Processing using Software Defined Networking"* International Journal of Computer Science and Network Security, vol. 19, no. 5, 2019, pp. 113-117.

CERTIFICATIONS

- Machine Learning by Stanford University from Coursera.
- Deep Learning AI Specialization from Coursera.
- Data Engineering with Google Cloud Platform certificate from Coursera.
- Hadoop and Big Data Framework, HPCC, NEDUET, Karachi.

LANGUAGES

Urdu: Native Language
English: Advanced Listening, Speaking, Reading, and Writing
German: Novice Listening, Speaking, Advanced Reading, and Novice Writing

SKILLS

Programming: Python, Java, Flutter, JavaScript, C++, SQL, NoSQL, PyTorch, Git, Docker, Kubernetes, Angular, Bash

OTHER

Interests: Artificial Intelligence, Deep Learning, Autonomous Robots
Hobbies: Football, Video Games, Tennis, Badminton