Shahbaz Ali

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Education

Lahore University of Management Sciences, Lahore Lahore, Pakistan
MS Computer Science, CGPA 3.17 *July 2019 - May 2021*
Courses: Machine Learning, Design and Analysis of Algorithms, Deep Learning, Computer Vision, Advanced Operating System, Applied Probability, Digital Image Processing, Computer Architecture, Speech Processing, ICT4D

Government College University, Lahore Lahore, Pakistan
BS Computer Science, CGPA 3.43 *Aug. 2014 – May 2018*
Courses: Operating Systems, Data Structures, Analysis Of Algorithms, Artificial Intelligence, Machine Learning, Networking, Databases, Theory of Automata, Compilers Construction

Experience

Senior Software Engineer Jan 2024 - Present
Formulatrix, Pakistan *Lahore, Pakistan*

- Working as a C# .Net developer on backend of in-house CRM application used by Formulatrix employees.

C Developer March 2024 - Present
Convsync, Pakistan *Lahore, Pakistan*

- Working as part-time C developer for Convsync which is working on a project for Skywater Technologies, Inc.
- Responsibilities included converting legacy code and framework written in Quake C, E-QUEL and Ingress VIFRED framework in collaboration with Ingress db into documentation which is understandable for high-level language developers.
- I documented the code and provided other developer with understanding of existing code and framework. The code was written more than 30 years ago.

Senior Software Engineer Aug 2021 - December 2023
Avanza Solutions *Lahore, Pakistan*

- Worked as a C++ Developer in the Electronic Funds Transfer (EFT) department.
- Worked on a product, **Rendezvous**, which is a middleware solution to incorporate multiple financial and non-financial channels i.e. Mobile, Internet Banking, POS, Credit/Debit Card Payment Systems, Core Banking, Loan Management Systems etc.
- Reponsibiliies included sending and receiving message over TCP/IP sockets to 1-link (which is national switch for IBFT payments in Pakistan)
- Worked for national and International Clients: KHCB (Bahrain), NRSP(Pakistan), F5(Dubai)
- Responsibilities included:
  - Development and deployment of new financial or non-financial transactions.
  - Unit Testing during development.
  - Managing databases using SQL/Oracle.

Teaching Assistant Jan 2020 - Jan 2022
Lahore University of Management Sciences *Lahore, Pakistan*

During my 2 year MS at LUMS, I worked as a TA for 5 graduate level courses and 1 undergraduate course. For these courses I designed and graded assignments/quizzes and also conducted tutorial sessions. The courses are:

- CS-535 Machine Learning with Dr. Agha Ali Raza (Fall 2021)
- CS-623 Hardware Architecture for AI with Dr. Rehan Hameed (Spring 2021)
- CS-5317 Deep Learning with Dr. Murtaza Taj (Spring 2021)
- CS-510 Design & Analysis of Algorithm with Dr. Imdad Ullah Khan (Fall 2020)
- CS-535 Machine Learning with Dr. Agha Ali Raza (Spring 2020)
- CS-331 Artificial Intelligence with Dr. Mian Muhammad Awais (Spring 2020)

Technical Content Engineer Feb 2021 - July 2021

Educative, Inc *Lahore, Pakistan*

- Created/Managed difference courses on the platform
- Played part in the review process of different courses
- Conducted interviews and helped in the hiring process

Software Development Engineer July 2018 - November 2019

Skill Knight Studios *Lahore, Pakistan*

- Worked on different cross platform mobile games. Mostly added features or updates to the games already published on Play Store and App Store.
- Maintained a match 3 game with large user base. Removal of bugs reported by users and also quarterly major/minor feature updates

Projects

Most of the projects listed below were during my BS and MS educational tenure. Professional projects are listed above in the EXPERIENCE section.

Inference for CNN model in C | *C/C++* March, 2021

- Trained the CNN on fashion-mnist dataset in Keras
- Saved the weights in binary files
- Then used this weights to make prediction in C code
- Implemented convolution, fully-connected, dropout, maxpool, relu and softmax layers in C

Face vs No-Face Image Classification via Linear Classifier | *Python, Keras* Jan, 2021

- Gather face images (male, female, child) from different datasets
- Gathered no-face images from IMAGENT data set
- Simply trained a liner classifier (without non-linearity)

Male vs Female Image Classification via CNN | *Python* Feb, 2021

- Gathered small male and image dataset from internet
- Trained different NN and CNN architecture and compared the results
- Used different training and test data, then improved the accuracy using data augmentation

Deep Convolutional Generative Adversarial Network (DCGAN) | *Python, Keras* April 2020

- Assignment of Deep Learning course implemented using Convolutional Layers
- Generated images of emojis (with good results) from Apple Emojis Dataset
- Designed both generator and discriminator networks

kNN Classifier | *Python* July 2020

- kNN classifier implemented on Iris Data Set

Naive Bayes Classifier | *Python* June 2020

- Multi-class classification using Naive Bayes on "Twitter US Airline Sentiment" dataset.

Recurrent Neural Network (RNN) | *Python, Keras* May 2020

- Cleaning the dataset by removing stop words, punctuation, and html tags
- Positive/Negative classification of movie reviews from IMDB dataset

Frequency Domain Filtering | *MATLAB* Nov 2020

- Created loop-based and vectorized implementation for FFT and IFFT
- Applied idead, butterworth and gaussian filter in frequency domain, and compared results

Content Based Image Retrieval (CBIR) | *MATLAB* Oct 2020

- Created the database of training images histograms
- Compared and retrieved the images based on similar histograms
- Also tried equalized image histograms to see if that is a good feature to compare images. Results were negative.

File System (Linux) | *C* May 2020

- Basic file-system which has all basic functions like open(), close(), read(), write(), format(), unlink()

- Managed multiple users accessing the same files simultaneously

Memory Management (Linux) | *C* April 2020
- Mimic the functionality of malloc() and free() in C without using any external API
- Added functionality like expand, coalesce and release for more efficient Memory Management

Web Server (Linux) | *C* March 2020
- Primitive Multi-threaded Clients and Multi-threaded Server model
- Clients send a request(using socket programming), which is completed and acknowledged by Server

Hidden Markov Model (Bakis Model) | *Python* Nov 2019
- Applied HHM for part-of-speech prediction in natural language

Binary Independence Model (BIM) | *Python* Oct 2019
- Applied BIM on corpus of 25000 news articles
- With trained BIM, the retrievals were very fast (milliseconds)

Addictive Gem Match Mania (Mobile Game) | *C#, Unity Engine* Dec 2018 - Nov 2019
- Match 3 mobile game for Android and iOS
- Added core features to the game
- Also fixed user reported bugs in the game (with 100000+ users)

Clothing Classification (Neural Network) | *MATLAB* June 2018
- Implemented & designed the architecture of Neural Network from scratch
- Implemented Backpropagation algorithm to learn to learn the best color combination of clothes
- Semester Project for Computer Vision Course

Handwritten Digit Classification (Neural Network) | *MATLAB* March 2018
- Implemented & designed the architecture of Neural Network from scratch to work on MNIST Dataset
- Implemented Backpropagation algorithm to learn to learn the best color combination of clothes
- Semester Project for Machine Learning Course

Among the Dead Ones! (Desktop Game) | *C#, Unity Engine* Feb 2018 - July 2018
- FPS Survival Shooter game for Desktop platform, worked as a part of my Final Year Project for Undergraduate
- Designed and programmed AI Zombies (NPC) for the game.
- Extensive work on Unity NavMesh System in collaboration with Unity's Macanim System to control the root motion of NPC Zombies
- Slide-free and accurate pathfinding for zombie character
- Ragdoll System to detect bullets with re-animation feature for Zombies & Audio Collection System with Scriptable Object

CrickSick Scoring Application (Android Application) | *Android Studio* May 2017
- Application for scoring/recording cricket matches
- Simple User Friendly interface to detect all the event of cricket match
- Semester project for Software Engineering Course

Technical Skills

A very good understanding of OPP concepts
Familiarity and understanding of relational databases like SQL
Good in logical and structural thinking
I have typing speed of **80 WPM** with querty keyboard (typeracer Profile)
Languages: Python, C, C++, MATLAB, C#, Java, SQL
Frameworks: Keras, TensorFlow, PyTorch
Developer Tools: PyCharm, Spyder, Jupyter Notebook, Git, VS Code, Visual Studio, Unity, Android Studio, SQL Server Management Studio
Libraries: pandas, NumPy, Matplotlib, OpenCV, Scrappy