

# Shahbaz Ali

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## EDUCATION

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**Lahore University of Management Sciences, Lahore** Lahore, Pakistan  
*MS Computer Science, CGPA 3.17* July 2019 - May 2021

**Courses Taken:** 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

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**Software Engineer** Aug 2021 - present  
*Avanza Solutions* Lahore, Pakistan

- Working as a C++ Developer in the Electronic Funds Transfer (EFT) department

**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

**Teaching Assistant** Jan 2020 - June 2021  
*Lahore University of Management Sciences* Lahore, Pakistan

Designed and graded assignments/quizzes for the following courses:

- 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)

**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

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**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

<ul style="list-style-type: none"> <li>• Gathered small male and image dataset from internet</li> <li>• Trained different NN and CNN architecture and compared the results</li> <li>• Used different training and test data, then improved the accuracy using data augmentation</li> </ul>	
<b>Deep Convolutional Generative Adversarial Network (DCGAN)</b>   <i>Python, Keras</i>	April 2020
<ul style="list-style-type: none"> <li>• Assignment of Deep Learning course implemented using Convolutional Layers</li> <li>• Generated images of emojis (with good results) from Apple Emojis Dataset</li> <li>• Designed both generator and discriminator networks</li> </ul>	
<b>kNN Classifier</b>   <i>Python</i>	July 2020
<ul style="list-style-type: none"> <li>• kNN classifier implemented on Iris Data Set</li> </ul>	
<b>Naive Bayes Classifier</b>   <i>Python</i>	June 2020
<ul style="list-style-type: none"> <li>• Multi-class classification using Naive Bayes on "Twitter US Airline Sentiment" dataset.</li> </ul>	
<b>Recurrent Neural Network (RNN)</b>   <i>Python, Keras</i>	May 2020
<ul style="list-style-type: none"> <li>• Cleaning the dataset by removing stop words, punctuation, and html tags</li> <li>• Positive/Negative classification of movie reviews from IMDB dataset</li> </ul>	
<b>Frequency Domain Filtering</b>   <i>MATLAB</i>	Nov 2020
<ul style="list-style-type: none"> <li>• Created loop-based and vectorized implementation for FFT and IFFT</li> <li>• Applied ideal, butterworth and gaussian filter in frequency domain, and compared results</li> </ul>	
<b>Content Based Image Retrieval (CBIR)</b>   <i>MATLAB</i>	Oct 2020
<ul style="list-style-type: none"> <li>• Created the database of training images histograms</li> <li>• Compared and retrieved the images based on similar histograms</li> <li>• Also tried equalized image histograms to see if that is a good feature to compare images. Results were negative.</li> </ul>	
<b>File System (Linux)</b>   <i>C</i>	May 2020
<ul style="list-style-type: none"> <li>• Basic file-system which has all basic functions like open(), close(), read(), write(), format(), unlink()</li> <li>• Managed multiple users accessing the same files simultaneously</li> </ul>	
<b>Memory Management (Linux)</b>   <i>C</i>	April 2020
<ul style="list-style-type: none"> <li>• Mimic the functionality of malloc() and free() in C without using any external API</li> <li>• Added functionality like expand, coalesce and release for more efficient Memory Management</li> </ul>	
<b>Web Server (Linux)</b>   <i>C</i>	March 2020
<ul style="list-style-type: none"> <li>• Primitive Multi-threaded Clients and Multi-threaded Server model</li> <li>• Clients send a request(using socket programming), which is completed and acknowledged by Server</li> </ul>	
<b>Hidden Markov Model (Bakis Model)</b>   <i>Python</i>	Nov 2019
<ul style="list-style-type: none"> <li>• Applied HHM for part-of-speech prediction in natural language</li> </ul>	
<b>Binary Independence Model (BIM)</b>   <i>Python</i>	Oct 2019
<ul style="list-style-type: none"> <li>• Applied BIM on corpus of 25000 news articles</li> <li>• With trained BIM, the retrievals were very fast (milliseconds)</li> </ul>	
<b>Addictive Gem Match Mania (Mobile Game)</b>   <i>C#, Unity Engine</i>	Dec 2018 - Nov 2019
<ul style="list-style-type: none"> <li>• Match 3 mobile game for Android and iOS</li> <li>• Added core features to the game</li> <li>• Also fixed user reported bugs in the game (with 100000+ users)</li> </ul>	
<b>Clothing Classification (Neural Network)</b>   <i>MATLAB</i>	June 2018
<ul style="list-style-type: none"> <li>• Implemented &amp; designed the architecture of Neural Network from scratch</li> <li>• Implemented Backpropagation algorithm to learn to learn the best color combination of clothes</li> <li>• Semester Project for Computer Vision Course</li> </ul>	
<b>Handwritten Digit Classification (Neural Network)</b>   <i>MATLAB</i>	March 2018
<ul style="list-style-type: none"> <li>• Implemented &amp; designed the architecture of Neural Network from scratch to work on MNIST Dataset</li> <li>• Implemented Backpropagation algorithm to learn to learn the best color combination of clothes</li> <li>• Semester Project for Machine Learning Course</li> </ul>	

### **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

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A very good understanding of OPP concepts

Familiarity and understanding of relational databases like SQL

Good in logical and structural thinking

**Languages:** Python, C, C++, MATLAB, C#, Java

**Frameworks:** Keras, TensorFlow, PyTorch

**Developer Tools:** PyCharm, Spyder, Jupyter Notebook, Git, VS Code, Visual Studio, Unity, Android Studio

**Libraries:** pandas, NumPy, Matplotlib, OpenCV, Scrappy