

# MUHAMMAD ARSLAN

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## Education

### Loyola University Chicago

*PhD. in Computer Science*

**Expected May 2028**

*Chicago, IL*

### Loyola University Chicago

*Master of Science in Data Science - Thesis Track*

**May 2025**

*Chicago, IL*

### University Of the People

*Bachelor of Science in Computer Science*

**March 2023**

*Pasadena, CA*

## Experience

### Teaching Experience

#### University of the People

*Volunteer Adjunct Instructor*

**Aug 2023 – Present**

*Pasadena, CA*

- Taught UNIV1001: Online Education Strategies, CS 3440: Big Data, and CS 4407: Data Mining and Machine Learning using pre-recorded instructional materials.
- Facilitated student learning by moderating discussions, clarifying course content, and supporting students' understanding of weekly modules.
- Evaluated assignments, provided timely and constructive feedback, and monitored student progress in accordance with university rubrics.
- Used the Moodle LMS for grading, communication, and management of course activities.

#### AIMS and Superior College

*Part-Time Instructor*

**Aug 2021 – Apr 2023**

*Layyah, Pakistan*

- Taught Computer Science courses to first-year and Intermediate in Computer Science educational program students using Punjab Textbook Board CS curriculum.
- Designed lesson plans and weekly practice tasks that reinforced theoretical content and supported students in developing computational thinking skills.
- Facilitated collaborative learning by organizing guided practice sessions, peer discussion groups, and hands-on coding activities.

### Research Experience

#### Loyola University Chicago

*Graduate Research Assistant*

**Aug 2023 – Present**

*Chicago, IL*

- Contributed to the **BullyBlocker** project by developing *SpectrumNet*, a deep-learning model that combines bidirectional networks and attention mechanisms to detect cyberbullying targeting LGBTQ+ youth, resulting in substantial performance gains over transformer-based baselines.
- At **AISec Lab** conducted research on adversarial robustness in NLP models by evaluating the vulnerability of modern text classifiers to Gradient-Based Optimization (GBO) attacks, demonstrating that small, human-imperceptible word-level perturbations can significantly degrade model performance and highlighting the need for more reliable and secure language models.
- Collaborated with the **James Ji Lab** on clinical informatics research involving ARDS (Acute Respiratory Distress Syndrome) patients, using causal discovery methods to study the impact of alcohol exposure on patient outcomes.

#### MLC Research Lab

*Research Scholar*

**Sep 2021 – Present**

*Okara, Pakistan*

- Worked on improving cybersecurity for IIoT systems by developing a malware detection model that combines XGBoost with GLCM-based feature extraction, resulting in stronger detection accuracy and efficient model performance.
- Explored the use of deep learning for multimedia understanding by building a visual sentiment analysis method that integrates a modified ResNet50 with Gradient Boosting, leading to notable improvements in classification quality.

#### University of Birmingham

*Research Scholar*

**Jan 2023 – July 2023**

*Birmingham, UK*

- Developed a 1D-CNN architecture for IIoT cybersecurity, achieving 99.90% accuracy and rapid data processing, outperforming existing models.
- Created a gradient-boosting algorithm for neonatal sleep research, improving classification accuracy and advancing biomedical applications.

#### Air University

*Research Intern*

**April 2022 – Aug 2022**

*Islamabad, Pakistan*

- Developed an AI-based system for autonomous vehicles, achieving 85.5% accuracy in real-time object recognition with YOLOv8.
- Collaborated in a multidisciplinary team to solve complex challenges in AI and Data Science, emphasizing the importance of teamwork.

## Industry Experience

### Contco LLC

Full Stack Developer

November 2021 – July 2023

Remote

- Led the development of a web application with TypeScript, React.js, and Redux.js, improving client operations by 30% while collaborating with a multidisciplinary team to deliver 6 major projects on time.
- Established a robust testing strategy using Jest and React Testing Library, enhancing code reliability, reducing production bugs by 40%, and increasing team efficiency by minimizing troubleshooting efforts.

### Microverse

Code Reviewer - Part Time

March 2021 – July 2023

Remote

- Completed 7000+ code reviews of real-world HTML, CSS, Ruby, Ruby on Rails, JavaScript, and React & Redux projects, helping software developers to improve their code quality and their understanding of core concepts.
- Created merge requests to improve the projects' requirements, provide better guidance to the students and upgrade the quality of the reviews.

## Skills

### Technical Skills

**Programming Languages:** Python, R, SQL, Bash, ECMAScript, GoLang, MATLAB, Common Lisp, Icon, Prolog

**Machine Learning & Deep Learning:**

- Deep Learning Models: Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), Convolutional Neural Networks (CNNs), Transformers
- Machine Learning Algorithms: Supervised and Unsupervised Learning, Clustering
- Computer Vision: OpenCV, Image Generation, Medical Image Synthesis, DICOM-PNG Conversion, Image Recognition, Object Detection
- Natural Language Processing: Text Classification, Named Entity Recognition, Sentiment Analysis, Topic Modeling, SpaCy, NLTK
- Frameworks: TensorFlow, Keras, scikit-learn

**Big Data Technologies:** HBase, Hadoop, Spark, Hive

**Cloud & Virtualization:** AWS, Kubernetes

**Database Management Systems (DBMS):** MySQL, MariaDB, MongoDB, PostgreSQL, SQLite

**Tools & Development Environments:** Git, Maven, Visual Studio, jQuery, React

**Other Technologies:** Web Scraping

## Publications

- Muhammad Arslan<sup>1</sup>, Muhammad Mubeen<sup>1</sup>, Muhammad Bilal<sup>2</sup>, Saadullah Farooq Abbasi<sup>2</sup>. *1D-CNN-IDS: 1D CNN-based Intrusion Detection System for IIoT*. The 29th International Conference on Automation and Computing (ICAC'24)
- Muhammad Arslan<sup>1</sup>, Muhammad Mubeen<sup>1</sup>, Syed Muhammad Usman<sup>2</sup>. *Object Detection for Autonomous Vehicles in Urban Areas using Deep Learning* Future Technologies Conference (FTC'24)
- Muhammad Mubeen<sup>1</sup>, Muhammad Rashid<sup>1</sup>, Muhammad Arslan<sup>2</sup>, Ahmad Aseeri<sup>2</sup>, Arslan Akram<sup>2</sup>, Muhammad Arfan Jaffar<sup>2</sup>. *A Deep Features Based Approach Using Modified ResNet50 and Gradient Boosting for Visual Sentiments Classification* IEEE 7th International Conference on Multimedia Information Processing and Retrieval (MIPR'24)
- Muhammad Arslan<sup>1</sup>, Manuel Sandoval Madrigal<sup>2</sup>, Mohammed Abuhamad<sup>2</sup>, Deborah Hall<sup>2</sup>, Yasin Silva<sup>2</sup>. *Detecting LGBTQ+ Instances of Cyberbullying*. The 17th International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction and Behavior Representation in Modeling and Simulation
- Muhammad Arslan<sup>1</sup>, Muhammad Mubeen<sup>1</sup>, Saadullah Farooq Abbasi<sup>2</sup>, Muhammad Shahbaz Khan<sup>2</sup>, Wadii Boulila<sup>2</sup>, Jawad Ahmad<sup>2</sup>. *A Single Channel-Based Neonatal Sleep-Wake Classification using Hjorth Parameters and Improved Gradient Boosting* International Polydisciplinary Conference on Artificial Intelligence and New Technologies (IPCAINT'24)
- Muhammad Arslan<sup>1</sup>, Muhammad Mubeen<sup>1</sup>, Giri Anandhi<sup>2</sup>. *Achieving multi-objectives using a single neural network*. Research & Reviews: Discrete Mathematical Structures
- Muhammad Arslan<sup>1</sup>, Muhammad Mubeen<sup>1</sup>, Giri Anandhi<sup>2</sup>. *Comparing Algorithm Performance in Machine Learning for Landslide Susceptibility Studies: An Overview*. Journal of Artificial Intelligence Research & Advances
- Muhammad Arslan<sup>1</sup>, Muhammad Mubeen<sup>1</sup>, Giri Anandhi<sup>2</sup>. *Strategies To Avoid Illegal Data Access*. Journal of Communication Engineering & Systems

## Award & Honors

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<b>Student Travel Award</b> <i>SBP-BRIMS'24</i>	<b>2024</b>
<b>Merit Award</b> <i>Master of Science in Data Science - Loyola University Chicago</i>	<b>2023 - 2025</b>
<b>Magna Cum Laude</b> <i>Bachelor of Science in Computer Science - University Of the People</i>	<b>2023</b>
<b>Dean's List</b> <i>Bachelor of Science in Computer Science - University Of the People</i>	<b>All semesters</b>
<b>Fully-Funded Scholarship</b> <i>Bachelor of Science in Computer Science - University Of the People</i>	<b>All semesters</b>

## Service

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<b>Reviewer</b> <i>SBP-BRIMS'25</i>	<b>June 2025</b>
<b>Data Science Department Representative</b> <i>Loyola University Chicago - Graduate Student Advisory Council</i>	<b>Aug 2023 - Present</b>
<b>Mentor</b> <i>Microverse</i>	<b>May 2020 - Present</b>
<b>Reviewer</b> <i>SBP-BRIMS'24</i>	<b>June 2024</b>
<b>Reviewer</b> <i>Computational Economics</i>	<b>Aug 2024</b>
<b>Reviewer</b> <i>ICWSM'25</i>	<b>Oct 2024</b>