

# HASNAIN ALI ARAIN

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## EDUCATION

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NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY

Karachi, PK

Bachelor of Engineering

Oct 2019 - Aug 2023

Major in Computer and Information Systems (with Distinction)

Cumulative GPA: 3.95/4.0; Rank 6 out of 152 (Top 4%)

Relevant Coursework: Software Engineering; Artificial Intelligence; Machine Learning

Accredited under The Washington Accord: [PEC Registered Engineer](#)

## WORK EXPERIENCE

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ARBISOFT

Lahore, PK

Software Engineer (Machine Learning)

Aug 2023 - Present

- Completed comprehensive training program at Arbisoft, specializing in AI/ML fundamentals and subsequently focusing on Generative AI.
- Conducted in-depth research on diffusion models and large language models, applying theoretical knowledge to practical implementations.
- Developed and launched ArbiChat, an internal company product serving as a chatbot for efficient question answering related to Arbisoft policies.
- Actively engaged in staying updated with the latest advancements in AI/ML and continuously expanding expertise in the rapidly evolving field.

CROSSWING INC.

Ontario, CA

Machine Learning Engineer

June 2022 - Aug 2023

- Lead a team of 3 engineers to utilize time-of-flight sensors (3D LiDAR) for developing a 3D virtual barrier around Toyota North America's forklift by ground plane and outlier segmentation (KD-Tree + RANSAC), and classify detected meshes using pre-trained PointNet.
- Worked on integrating language-grounded priors for visual-inertial odometry for localizing Bishop Cleanbot within a mapped hallway.
- Implemented a perspective transform for regressing skeletal key points of worker pose during sunroof fitment, and implemented a real-time physics simulator rendering (using MuJoCo) as a digital twin.
- Implemented an ensemble of demand forecasters (Multivariate Regression Models, Exponential Smoothing, Holt-Winters Seasonal Model, Two-Level cascaded method, and Temporal Fusion Transformer) for automated part re-ordering.
- Formulated supply chain optimization with a separable structure, and implemented cascaded Lagrangian Relaxation (to mitigate hard coupling constraints), Backward Dynamic Programming (to solve subproblems formulated by Lagrangian Relaxation), and Interleaved Conjugate Gradient Method (to systematically filter out sub-optimal solutions).

DATA SCIENCE DOJO

Redmond, US

Data Science Intern (Natural Language Processing)

April 2023 - Aug 2023

- Contributed to end-to-end project lifecycle, encompassing data collection, preprocessing, modeling, evaluation, and result presentation.
- Applied expertise in working with large language models, specifically GPT-3 and GPT-3.5, to extract valuable insights from textual data.

## RESEARCH EXPERIENCE

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### NED UNIVERSITY

- Research Assistant to Dr. Majida Kazmi in a project on Urdu OCR contributing to the advancements in character recognition for Urdu Language.
- Final Year Design Project under the supervision of Dr. Maria Waqas focused on the task of resolution enhancement of low-quality images using GANs.

### CARNEGIE MELLON UNIVERSITY

- Ongoing Research Project at the Robotics Institute in Carnegie Mellon University centered around integrating multiple modalities of perception, particularly RGB feed and LiDAR scans, in Large Language Models under the supervision of Mr. Shahram Najam Syed.

## PROJECTS

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- Multimodal perception stack for Autonomous Forklift (CrossWing Inc.)
- Bishop Cleanbot: An Autonomous Mobile Robot for UV Deep Cleansing (CrossWing Inc.)
- End-to-end AI-based automotive sunroof installation & supply chain management (CrossWing Inc.)
- Resolution Enhancement of Low-Quality Images using GANs (NEDUET)
- Vision-Language Model for Vision-Language Navigation and Manipulation Agents (Independent Research)

## ACTIVITIES

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### CODE IN PLACE 2023, STANFORD UNIVERSITY

Apr 2023 - June 2023

#### Section Leader

- Instructed virtual live classes for a cohort of 10-15 students, delivering comprehensive lessons for CS106A Introductory Python programming.
- Conducted weekly sessions to support students in their learning journey, addressing questions and providing guidance on Python coding concepts.

### ARTIFICIAL INTELLIGENCE CLUB, NEDUET

Dec 2020 - Dec 2021

#### Technical Manager

- Successfully organized and executed multiple educational workshops, fostering hands-on learning experiences for fellow students interested in Artificial Intelligence.

## CODING COMPETITIONS

- Winner of IEEE Envision, 2021 Speed Debugging Competition (NED University)
- Winner of AI Festival, 2021 Data Science Competition (NED University)
- Advent of Code 2023 (Top 3% on Company's Private Leaderboard)

## HONORS AND AWARDS

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- Recipient of Prime Minister's Youth Laptop Scheme, 2023
- Recipient of AWS AI & ML Scholarship Program by Udacity, 2022
- Secured IGNITE NGIRI funding for my Final Year Project, 2023
- Shortlisted for Huawei: Seeds For the Future Program, 2022
- Recipient of Google Career Certificates Scholarship by IRM, 2022
- Recipient of NED Alumni Association of Houston Scholarship, 2020
- Semifinalist for Crossroads Emerging Leaders Program by Harvard University, 2020

## COURSES AND CERTIFICATIONS

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- [AI Programming With Python Nanodegree](#)
- [IBM AI Engineering Professional Certificate](#)
- [Machine Learning Fundamentals Nanodegree](#)
- [IBM Data Science Professional Certificate](#)
- [AWS Machine Learning Foundations](#)
- [HarvardX: Technology Entrepreneurship: Lab To Market](#)

## ADDITIONAL

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**Technical Skills:** Proficient in Python and SQL; Familiar in Javascript, R, Rust, C++

**Frameworks and Libraries:** Django, Flask, React, OpenCV, tensorflow, pytorch, scikit-learn, pandas, numpy

**Artificial Intelligence Skills:** computer vision, natural language processing, large language models

## REFERENCES

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**Mr. Shahram Najam Syed**  
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Robotics Institute  
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