

# Nehal Ahmed Shaikh

Hyderabad, Pakistan  
+92 336 2758828

[nehalahmedshaikh@gmail.com](mailto:nehalahmedshaikh@gmail.com)  
[GitHub](#)

## EDUCATION

---

University:	Lahore University of Management Sciences	Major:	Economics-Mathematics
Duration:	July 2020 - July 2024	Minor:	Computer Science
Degree Type:	BSc	CGPA:	3.70/4.00

## RESEARCH INTERESTS

---

- Developing and improving algorithms for social and strategic interactions—using machine learning, optimization, and game theory—and exploring their applications in economics and other social sciences.
- Improving large language models by studying the underlying theory and exploring their applications in economics and other social sciences.

## RESEARCH EXPERIENCE

---

Topic:	Unrolling Optimization Algorithm for Matrix Completion
Advisor:	<a href="#">Dr. Muhammad Tahir</a>
Expected Duration	12 months
Status:	Ongoing

Summary: Initially implemented several deep learning algorithms—CNN, auto-encoder, LSTM, and ViT—for computer vision tasks (see: [DeepLearning](#)). The [project](#) evolved into studying existing matrix completion algorithms, replicating their results, and eventually accelerating them via deep unfolding to propose a novel algorithm.

## GRADUATE-LEVEL COURSEWORK

---

<u>Code</u>	<u>Name</u>	<u>Grade</u>
CS 6314	Dynamic Programming and Reinforcement Learning	A-
CS 535	Machine Learning	A
CS 5302	Generative AI for Speech and Language Processing	(pending)
CS 437	Deep Learning	A
ECON 438	Econometrics II	A-
MATH 325	Convex Optimization	A+

## OTHER RELEVANT COURSEWORK

---

<u>Code</u>	<u>Name</u>	<u>Grade</u>
CS 334	Principles and Techniques of Data Science	A
CS 331	Introduction to Artificial Intelligence	A
MATH 334	Numerical Analysis	(Pending)
MATH 230	Probability	A
MATH 120	Linear Algebra	A-
MATH 102	Calculus II (multivariate)	A+

## PROJECTS

---

- **Panel Data and Tobit Analysis on Health Care Dataset**

Data: [German Health Care Usage Data](#)  
Software: Stata

Summary: Analyzed healthcare service utilization in Germany employing tobit, fixed effects, and random effects models on a unique panel data set spanning from 1984 to 1995, while focusing on socio-economic disparities in healthcare access and hence contributing critical insights to health-care economics. (see: [PDF](#)).

Skills learned: tobit analysis, panel data analysis, policy evaluation

- **Air Pollution & Academic Performance**

Data: Customized synthesis of ASER and NASA data  
Language: Python

Summary: Explored the relationship between air pollution and academic performance in Pakistan to know whether there exists any relationship between the two and to predict academic performance scores based on pollution data (see: [blog](#)).

Skills learned: data synthesis, web-scraping, deep learning for regression analysis

- **Sentiment Analysis on Audio Recordings**

Data: [CREMA-D](#)  
Language: Python

Summary: Applied various classifiers—K-NN, logistic regression, naive Bayes, SVM, and neural network—to predict the emotion signified by an audio and performed comparative metric analysis (see: [PDF](#)).

Skills learned: Speech processing, classification algorithms, hyperparameter tuning, sentiment analysis

- **Regression Analysis to Estimate the Effect of Gender on Academic Performance**

Data: Field data collection through questionnaires  
Software: Stata

Summary: Utilized a multiple linear regression model, featuring a host of explanatory variables, to conclude whether there is any significant difference between the CGPA values of male and female students (see: [PDF](#)).

Skills learned: Assumptions validation, data cleaning, econometric modelling, questionnaire design

- **Regression Analysis on the Determinants of New York Housing Prices**

Data: [Housing-prices](#)  
Language: R

Summary: Created a multiple linear regression model to determine the significance of factors affecting housing prices in New York and the effect of outliers by performing extensive data analysis (see: [PDF](#)).

Skills learned: Exploratory data analysis, feature selection, statistical modelling

- **Doing Economics: Implementations of Empirical Projects**

Language: MATLAB

Summary: Implemented 4 out of 12 projects from CORE's textbook (see: [repository](#)).

## EXPERIENCE

---

- Teaching assistant for EE 563/MATH 325: Convex Optimization.

## HONORS AND AWARDS

---

- Placed multiple times on Dean's Honor List at Lahore University of Management Sciences throughout the undergraduate program.

## SKILLS

---

- Programming: C++, MATLAB, Python, R
- Software: Canva, Microsoft 365 Suite, RStudio, Stata, Visual Studio Code
- Other: Git, LaTeX