

STATEMENT OF PURPOSE

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I, **Rao Muhammad Umer**, am a **Lecturer** and **research associate** in the Department of Computer Science and IT at The University of Lahore, Lahore. Previously, I was a graduate student with background in research, Machine Learning and Data Science, language, and writing blogs with a passion for challenge teamwork, interdisciplinary scholarship, and Eastern & Western poetry. “Every day is a miracle ... No matter how bad my circumstances, I have the freedom to choose my attitude to life, even to find joy ” Alice Herz Sommer.

I received my BSc degree in Computer Systems Engineering from The Islamia University of Bahawalpur in 2014. I, then, joined Pakistan Institute of Engineering and Applied Sciences, Islamabad, Pakistan, as a research fellow in the Department of Computer and Information Sciences. As far my educational background, I completed my matriculation in Science with distinction grades. The board of Intermediate and Secondary Education awarded me the merit scholarship for excellent academic performance in Secondary School examination, that had been covered my studies expenses for 2 years of my Intermediate school education. After the completion of Intermediate School education, I got fully funded **National ICT scholarship** for 4 years undergraduate degree program that was given by IT ministry of federal government of Pakistan. National ICT Award scholarship is given to 500 talented students every year from underprivileged areas of all over the country by Federal Govt. of Pakistan. This scholarship covered all my expenses, including tuition fee, residential, books expenses as well as my monthly pocket expenses. After completing the undergraduate studies, I got **Pakistan Institute of Engineering and Applied Sciences (PIEAS) Fellowship** by IT Endowment Fund, sponsored by Higher Education Commission (HEC) of Pakistan for MS Computer Science Program. This scholarship is given every year about 15 to 20 students from all over the country. This scholarship covered all my expenses, including tuition fee, residential, books as well as handsome monthly stipend.

Besides the curriculum activities, I am fully involved in non-curriculum activities. I am a good cricket player from my school level to Master level institution. At school level, I was a captain of my cricket team. This gave me the confidence to get well performed in my educational activities.

So far my language skills, I am a good communicator of my native language as well as national and international languages. My primary education is in my national language i.e. Urdu and my College, undergraduate and post graduate education is in international language i.e. English. All of the education level as well as non-education level, my language skills such as speaking, listening, reading and writing are quite well. I am very eager to learn more national and international languages because this thing gives me a new adventure to talk people with their own language.

I have had many career planning discussions with my advisors and mentors, Dr. M. Abid Mughal and Dr. Fayyaz ul Amir. Both are principal scientists and associate professor in Department of Computer and Information Sciences at Pakistan Institute of Engineering and Applied Sciences, Islamabad, Pakistan. These discussions and specific seminars in Machine Learning & Deep Learning have deeply influenced my career choice.

My math, physics, and engineering courses have steadily steered and guided my career path. More specifically, my courses in Machine Learning, Deep Neural Networks, Information Retrieval and Data Mining, GPU Computing, Pattern Classification and Recognition, Computational Intelligence and Bioinformatics have provided a very good foundation for my proposed work and career objectives. My coursework has given me a foundation to participate in this ongoing technological revolution; one day as a professor.

I have taught computer science courses, including Digital Logic Design, Programming Fundamentals, Introduction to Information and Communication Technologies, and Business Computing. I have delivered couple of invited talks at Deep Learning and Data Science in different workshops. This has given me a wonderful glimpse into the world of teaching. It has

1. *taught me the value of explaining technical material to others,*
2. *forced me to deeply think about what I have learned and how to best communicate it,*
3. *taught me the value of exploring and comparing alternative problem approaches.*

This has further sharpened my problem solving skills as well as given me a greater insight into student thinking. This should help me to become a better teacher. I can see how fun it would be to introduce cutting-edge research ideas into

the classroom something I would be able to do as a professor. My strengths are my consistency, capacity for hard work, and my ability to work in a team. I have been participated in many course projects, which involved a group of students, and I have been the team leader in quite a few of these. I believe that research involves new ideas, as well as consistent effort to back them up, both of which I am capable of.

My research focuses on machine learning, i.e. in the development of algorithms capable of extracting hidden insight and knowledge from data. My aim is to build intelligent systems with minimal human effort that is capable of solving human community problem in a better way. I believe that efficient algorithms for learning knowledge representation are at the core part of such goal. I intend to collaborate with Industry in understanding and developing solutions for practical problems. I believe my past experience of research work done jointly with a number of colleagues as well as my prior record of participation with Industry will help me achieve this. I am excited at the prospect of learning, contributing, giving shape and making an impact in Machine Learning and Data Science upcoming and challenging fields. I am ambitious to pursue my career in the research in academia. In future, I envisage myself as a full-fledged research professional and faculty member at one of the leading universities in the world. It would allow me to teach, conduct world-class research, mentor students, supervise their work, and contribute significantly to the technological development of the nation.

I am particularly interested in machine learning and deep neural networks, mostly applied in the context of big data and to artificial intelligence problems such as information retrieval, natural language processing and computer vision.

More specifically, my research mainly discourses the following topics:

Tasks: Supervised, Semi-supervised Learning, Unsupervised Learning, Structured Output Prediction, Active Learning, Ranking

Models: SVMs, neural networks, deep learning, Markov random fields

Applications: Information retrieval, Data Mining, Document classification, Recommendation System