Mohammad Nayeem Hasan
Statement of Purpose

As a seasoned humanitarian professional with over three years of expertise in health-related data management gathered from several reputable national and international organizations. I acknowledge the paramount importance of advancing my academic pursuits. Doing so would help bridge the gap between my extensive professional background and research involvement, creating a comprehensive knowledge base essential for addressing evolving health challenges.

Pursuing a doctoral program in **Deep Learning, Data Science, and AI Intelligent Systems Development** at the **University of Texas Arlington** aligns seamlessly with my educational and professional aspirations in the short and long term. In the immediate future, my goal is to refine my Statistical skills to conduct original, impactful research. Looking ahead, my long-term vision involves leading a research laboratory dedicated to advancing statistical design and methodology, mentoring future generations of scientists, and fostering a team committed to applied and collaborative work. My determination to excel in Statistics is fueled by academic influences and esteemed professionals who have generously guided me and inspired my dedication to continuous learning.

My enthusiasm for a statistical approach can be traced back to my undergraduate studies, marking the commencement of my research expedition. This journey commenced with an exploration into the correlation between delivery methods (C-section versus normal) for newborns and their vulnerability to diseases (such as diarrhea, short or rapid breaths, cough, fever, etc.) in Bangladesh. In this endeavor, we conducted advanced statistical analyses, initially employing Pearson's chi-squared test and Poisson regression models. However, confronted with over-dispersion in the data, we subsequently applied negative binomial (NB) regression models. This project was my maiden application of the statistical knowledge cultivated during my undergraduate education. Furthermore, my Second Major in Computer Science and Engineering significantly augmented my adeptness in utilizing diverse statistical programming languages, including SPSS, SAS, Stata, and R. This educational background streamlined the data analysis process for me, rendering it both seamless and efficient. Within the research team, my primary role involved implementing various statistical tools and techniques, fostering a compassionate inclination toward the research domain. Consequently, my principal research interests revolve around statistical learning/machine learning, time series analysis, multivariate analysis, generalized linear and nonlinear regression models, cluster analysis, variable/feature selection, modeling biological data, and big data analysis.

I have effectively applied my academic aspirations to professional achievements following the completion of my Bachelor of Science in Statistics from Shahjalal University of Science and Technology, Sylhet. My educational journey enriched my practical knowledge through engagement in research endeavors, commencing with foundational courses such as Principles of Statistics, Theory of Statistics, Sampling Techniques, Design and Analysis of Experiments, and Statistical Inference course during my undergraduate years. However, it was during the advanced stages of my education, specifically in the third year, that I was formally introduced to Regression Analysis and Statistical Computing. This marked the point where I could apply the theoretical foundation acquired in the initial two years of study to practical applications. In these courses, I came to realize the power of statistical data analysis in identifying trends, patterns, and valuable insights. As I progressed into my fourth year and pursued my MS program, I delved deeper into the application of statistical tools, particularly within **data mining and time series analysis**. During my MS program, I initiated work on various projects under the SUST Research Center and Department of Statistics.

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In my current role in Humanitarian Response as a Monitoring and Evaluation Officer (Health) in the Monitoring, Evaluation, and Research Department of Greenhill-Community Partners International, I have been fortunate to engage in various projects aimed at achieving the best health outcomes for affected populations. As a humanitarian worker, I actively contributed to the Rohingya Refugee/Forcibly Displaced Myanmar Nationals (FDMN) Response Program by assisting in research recruitment and collaborating on data analysis. The project I am currently involved in is titled "Enhancing Community Health, Water Sanitation & Hygiene, Health Systems Support & Health Post for FDMN and Host Community Population". However, the journey through this program was not always without challenges, and I played a pivotal role in propelling it forward through the implementation of strategies like advocacy, communication, and social mobilization, providing crucial technical support to the program team, enhancing service quality through capacity building, and effectively managing data collection and generating insightful reports.

Throughout this tenure, I actively participated in voluntary initiatives and authored over 30 publications in esteemed journals within the realm of Statistical methods. In these publications, I served as the lead statistician, overseeing the statistical data analysis and employing various techniques. My involvement in research amid the COVID-19 pandemic yielded publications in impactful journals, reflecting the significance of my contributions. Additionally, I have been extensively engaged in addressing the Dengue outbreak in Bangladesh spanning 2022-2023. The outcomes of this ongoing work have been published in several impactful journals, further underscoring the relevance and impact of my efforts. Moreover, my repertoire of statistical experiences encompasses a spectrum of methodologies. These include bivariable analyses such as the chi-square test and crude logistic regression, as well as multivariable (adjusted) logistic regression, linear regression, multivariate analysis, cluster analysis, and various time series models like Simple Exponential Smoothing (SES), Auto-Regressive Integrated Moving Average (ARIMA), Auto-Regressive Integrated Moving Average with explanatory variables (ARIMAX), Automatic forecasting time-series model (Prophet), and Generalized Additive Model (GAM), among others.

Pursuing the Ph.D. program at the **University of Texas Arlington** represents a significant stride toward becoming an independent scientist in my home country, focusing on Statistics. I am eagerly anticipating the opportunity to collaborate with **Dr. Shouyi Wang**, whose research aligns closely with my interests. Their unique approach, to integrating Statistics/Deep Learning/ Data Science, promises a comprehensive understanding of multifaceted associations, particularly in delving into Statistics, given my foundation in those field experiences gained from my BSc, MS, and prior research work. With their guidance, I will obtain the robust knowledge base necessary to achieve my research leadership aspirations. Combined with my sharpened critical thinking skills stemming from my expertise and experience, I am fully prepared to embrace the academic challenges and opportunities the **University of Texas Arlington** presents.

Thank you for considering my application.