**Letter of Recommendation**

It is a great pleasure for me to write about Mr. Abdus Salam Azad, who is applying for the Graduate program at your renowned University. Being Azad’s course instructor, thesis supervisor, and also colleague, I am familiar with his works very closely.

He first worked with me in his undergraduate thesis. We aimed at reviewing the literature of Genetic Algorithms and its application on Vehicle Routing Problems (VRP). Later on, we proposed a new variant for periodic multi-depot VRPs. We also developed a simple stochastic Memetic algorithm to solve the problem. This work has been accepted in the reputed journal *IEEE Transactions on Cybernetics* (*Impact Factor: 7.384*). He contributed towards several key aspects of the work such as generating new ideas, designing stochastic learning, and conducting extensive experiments. His writing ability is promising too and improved a lot during this work. The characteristics I value most in him are his consistency and perseverance. During development of the algorithm, sometimes new approaches failed to improve the results. However, he was sincere throughout the process. In each setback, he conducted a deeper analysis to get a better understanding of the problem. By running experiments and analytical analysis, he found out the shortcomings of the proposed method and addressed those issues to improve the method further.

During undergraduate studies, Azad took two of my theory courses, Artificial Intelligence (CSE401) and Machine Learning (CSE471). He wasvery fascinated towards these subjects, particularly in Machine Learning. He used to be attentive in the classes and participated actively by asking questions or sharing ideas. He scored the highest marks in Machine Learning theory with a significant difference than the second highest score. He also took my Machine Learning lab. During the viva of his first assignment, he completed the assignment task successfully. However, he wasn’t able to answer some questions in depth. While checking his next assignment, he was more confident than the previous time and was answering the questions with greater insight. I was quite amazed when he referred me to a paper while answering one question. He actually studied some relevant papers as a preparation for the viva. I enjoyed checking his assignments the subsequent weeks as he continued to answer insightful questions and showed a good understanding of the topics. He also conducted experiments to submit an extra report analyzing the effect of *k*’s value on the *k-*NN algorithm. Overall, he always seemed highly motivated in the field of Machine Learning.

After graduation, Azad joined the department as a lecturer. Till this, I have conducted two Lab courses with him: Machine Learning and Artificial Intelligence. In Machine Learning lab he was very enthusiastic. I particularly remember one of his lectures, where he engaged the studentsquite in an unorthodox way to solve an imaginary problem faced by Rafael Nadal, later to be discovered as a classification problem and be solved by ID3. He was able to attract and sustain the interest of the students throughout the class, presenting with lots of figures, diagrams, and a couple of Rafael’s photos. In Artificial Intelligence lab, he gave a great effort to design new experiments on A\* Search, Local Search, and Adversarial Search under my supervision.

Bangladesh University of Engineering and Technology is the most prestigious engineering university in Bangladesh. As faculty members, we regularly participate in projects of national interest. Azad took part with me in such a project where we had to test and audit the software installed for Machine Readable Passports in 33 Regional Passport Offices of Bangladesh. Our team worked with the developer team to correct errors, redesign incorrect flow of information, and improve the software further. His primary task was to oversee the conformation of the captured photos and fingerprints to the standard. He showed a substantial depth of knowledge in software systems and contributed towards several improvements of the overall system.

Based on my collaboration with him, he also showed good coding skills. We performed an extensive empirical evaluation of our methods during our research and he conducted those successfully and quickly. During the lab courses his implementations were typically quite fast. I remember about his implementation of *Naïve Bayesian Classifier*for text classification, where many other students’ code was taking much more time to execute.

Finally, throughout these years Azad has been a sincere learner and has grown a strong foundation for doing novel research work.He has the necessary knowledge and practical experience in the fields of machine learning and artificial intelligence. What I value more is, he has the drive to learn new ideas and concepts when needed. He also has a good acquaintance with the current research frontiers. Based on my long history of interactions with him, I have full confidence that he will be very successful in his Ph.D.with his hard work and determination. Therefore, I strongly recommend him for admission in your graduate program. I wish him all the success in his quest for knowledge and excellence.

-- Doing undergraduate research is not easy in BUET, as the students have an extensive pressure with their academic courseworks and lab projects. It is always very challenging to make good results and at the same time give effort for inventing new things. However, I saw a strong motivation in Rizvi to investigate different aspects of computer science during his undergraduate study-span.

Dr. Md. Monirul Islam

Professor

Dept. of Computer Science and Engineering,

Bangladesh University of Engineering and Technology

Dhaka-1000, Bangladesh

E-mail: mdmonirulislam@cse.buet.ac.bd