Letter of Motivation

I am Mahmudul Hasan, a graduate from the Department of Computer Science and Engineering, University of Asia Pacific (UAP). I come from a developing country in Southeast Asia that has high potentials of becoming the next IT hub of the continent, and I want to be on a leading role of that journey. To enhance my preparation for this goal, I am interested in pursuing a higher degree in Information Technology from a reputed university like the University of Eastern Finland.

Since early childhood, I was always curious about technology, electronics, computers, and how these things worked. As a child, I used to wonder how TVs telecasted things that were so far away, right in front of my eyes, how telephones carried my messages to the other side of the planet, how videogames brought each of their characters alive and made them respond to my stimulations. I used to study science and tech-related resources whenever I got hold of them, just to find the answers to my questions.

My curiosity drove me to study science in school and to my benefit, my added interest in science got me good grades. But my curiosity was not to be quenched so easily. The child in me still had a lot of questions about how technology, especially computers worked, and how I could make them work as I pleased.

So, naturally, I selected the subject Computer Science and Engineering to study for my undergrad degree. As I proceeded with my undergrad studies, I started to realize that CSE is so much more than just computers and technology. It's a branch of science on its own that requires mathematical and analytical skills, as well as a thorough understanding of engineering and design. I had to learn different sorts of programming languages along with various techniques of problem-solving. To be honest, at first I found it quite difficult.

But after I started understanding the basics of Computer Science, it got easier. At one point I realized that I was enjoying my subject. That was when I knew that I had made the right decision to study CSE and I found my true passion here. As my undergrad studies closed to an end, my academic performance got significantly better. So much so that I achieved Dean's Award in the first and second semesters of my third year, and the VC Award in both the semesters of my final year.

Since my bachelor's program, I have been in contact with Mr. Tanmoy Sarkar, a faculty member at UAP who is currently earning his doctorate at Virginia Tech, USA. I always made an effort to comprehend his ongoing research projects and pursue my own research interests. At one point, I got inspired in conducting research on physiological data using the combination of medical science and computer science. I continued to learn how to deal with biological data, including data collection, noise reduction, signal decomposition, and feature selection, as well as improving my Machine Learning skills. Towards the end of the third year, I became involved in a research project where I worked with students' brain signals (EEG). I attempted to classify their emotions as attentive, neutral, or bored using Long Short-Term Memory (LSTM), Support Vector Machine (SVM), and Convolutional Neural Network (CNN) models, where LSTM showed the best performance.

In my academic thesis, I conducted a study on emotion recognition using the well-known DEAP dataset. In extracting emotions from brain waves and classifying them into four composite classes, my team and I obtained significantly better classification accuracy than the previous studies by other researchers. Additionally, we have unveiled a novel technique that can accurately indicate almost all of the emotions that people feel in real life. Our research has been accepted at a reputed Japanese conference and published in IEEE Xplore under the title ***Fine-***

Grained Emotion Recognition from EEG Signal Using Fast Fourier Transformation and CNN, with me as the main author. I am currently working on developing a framework to detect human emotions from real-time EEG signals in order to make this research more productive. I am also seeking a pattern in EEG signals of individuals with neurological disorders for the purpose of swiftly diagnosing conditions such as epilepsy and Alzheimer's disease.

Apart from research, I also have some professional experience of working in the tech industry. I had worked as an intern at a USA based startup called Move Your Chains as a part of my Industrial Training course of my bachelor program. I also received a four-month training from a reputed Bangladeshi web development training institute called Programming Hero where I learned front-end developing to prepare myself as a full-stack developer. I was employed as a remote front-end developer at a company called INMOGR located in the United Arab Emirates until April 2022. In addition to research, I am currently working as a freelance full-stack web developer.

While working on different projects, I discovered what I wanted to do for the rest of my life, and that is, making a positive impact on the human civilization with the help of information technology. As I come from a developing country that has recently gotten in touch with IT, I want to take a leading role in its journey to become the tech tycoon of the near future. And for that, I would need a proper and firm knowledge and skill in this field. I am applying for the MSc degree in Information Technology (IT) because of this.

When I did some research selecting the optimal institution for studying this subject, I found the University of Eastern Finland to be the best to suit my requirements to help me reach my goals. I noticed some research works that were conducted by some faculty members of UEF on Physiological Data and Artificial Intelligence that perfectly match my field of interest. I must mention the recent publication by ***Prof. Xiao-Zhi Gao*** *titled "****An Efficient Attribute Reduction and Fuzzy Logic Classifier for Heart Disease and Diabetes Prediction****", and* ***Prof. Pasi Fränti'***s publication on biomedical signal processing and control *titled "****Detection of time irreversibility in interbeat interval time series by visible and nonvisible motifs from horizontal visibility graph****"* that inspired me a lot.

I am intrigued to work under such instructors and I am optimistic that I can also prove myself to be a leading researcher if I get the opportunity to study here at the University of Eastern Finland. I really hope that I will be granted the chance to attend this esteemed university, where I can achieve my fervent aspiration through access to its superior academic and research opportunities and be able to make a meaningful contribution to advancing human civilization.