Certification: Letter of Recommendation

It is my pleasure to certify and recommend **Mahatir Ahmed Tusher** for successfully completing the first half of the private thesis course in the areas of *Quantum Information*, *Quantum Computing*, and *Quantum Machine learning* at <u>Mahdy Research Academy</u>, under **my supervision** and the guidance of my team of Young Experts. I am writing this letter of recommendation after thoroughly reviewing all the **assignments submitted during the 1**st half of the course, which included the initial 20 classes out of a total of approximately **40**.

The private thesis and research program aims to produce a Q1 or Q2 journal publication, and the 1st half of the course took place from January, 2024 to June, 2024. **Each online session averaged 2.5 to 3 hours in length.** This letter is being provided to participants who completed nearly all the assignments for the 1st part of the course, achieving over **80% marks**.

The 1st half of this research course, conducted online in a private setting, covered an extensive syllabus ranging from foundational to advanced topics in *Quantum Information, computing & quantum machine learning* research. The curriculum included both **theoretical concepts and simulation learnings**. Several junior faculty members, as well as PhD, MSc, and BSc students from almost all universities across Bangladesh, participated in the course. **For more details, including a list of participants and Young Experts, please visit the course website:** <u>Online Research Course</u>.

I certify that Mahatir Ahmed Tusher has participated fully in the 1st half of the course and obtained more than 80% marks (out of 100) after completing all the assignments.

In summary, the 1st half of this research course (covering topics from basic to advanced Quantum Information, Quantum Computing, and Quantum Machine Learning, along with hands-on experience on QISKIT coding) has included the following:

- 1. A comprehensive course on quantum computing (recorded lectures of Dr. Mahdy targeting matrix mechanics) was provided. Participants were required to submit updated versions of their class notes after watching all lecture videos.
- 2. The live online classes included discussions (& simulations) on several published journal/arXiv articles, covering a range of topics such as: quantum error correction, quantum communication, quantum cybersecurity (quantum key distribution protocols and post quantum cryptography), quantum machine learning, and quantum energy teleportation. These discussions and simulations also included my own published research (journal and arXiv articles). In total, there were 8 central live classes (where Dr Mahdy and Young experts were directly involved), and 12 live sessions led by the assigned Young Experts.
- 3. Participants and their respective groups selected a specific area of focus from the topics mentioned in (2). Each group was assigned to a Young Expert, who provided ongoing support and addressed the group's questions and challenges on a weekly basis.
- 4. QISKIT simulations from several journal articles (areas mentioned in (2)) were demonstrated during the live online classes. The course covered QISKIT from basic to advanced levels, with some sessions also including explanations of analytical calculations.
- 5. Several advanced relevant theories were discussed during the online live classes (both central & YE sessions).
- 6. We have covered some very serious technical discussions (online) on how to explain the results of articles.
- 7. Participants were given various individual and group assignments based on their areas of focus (areas mentioned in (2)). Finally, each group was tasked with presenting a journal article selected from a pool of QC related papers, as well as reproducing the simulation/ code-based experimental results from the chosen article.

I believe that **Mahatir Ahmed Tusher** demonstrates a strong commitment to learning, as evidenced by his decision to enroll in this private, paid thesis course. His completed assignments further support this assessment. I am confident that he will excel in the topics covered during the 1st half of the Quantum Computing/ Quantum Information research program. If you have any further questions, please feel free to contact me.

[Additional note: I have not certified anyone else whose identity is not given in the aforementioned website(<u>Online Research Course</u>). All the participants are available in the list given in the website. This letter has been provided only to the participants who completed the assignment very carefully in a proper way and obtained more than 80% marks out of 100.]

Dr. Mahdy Rahman Chowdhury.

PhD, Department of ECE, National University of Singapore.

MAHDY Signature:

Associate Professor, North South University, Department of ECE, Dhaka, Bangladesh. Email: <u>mahdybuet@gmail.com</u> and <u>mahdy.chowdhury@northsouth.edu</u> <u>NSU website</u> <u>Google Scholar</u>