QUANTUM MACHINE LEARNING AS AN AI ACCELERATOR

* Vikram Singh Sankhala
** Dr. Shalini Singh

ABSTRACT

Artificial Intelligence (AI) has permeated all aspects of our lives today. However, to make AI behave like real AI, the critical bottleneck lies in the speed of computing. At the interface between quantum computing and machine learning, the field of quantum machine learning aims to improve classical machine learning algorithms with the help of quantum computers. Recently, increased computational power and data availability, as well as algorithmic advances, have led machine learning (ML) techniques to impressive results in regression, classification, data generation and reinforcement learning tasks. Quantum machine learning witnesses an increasing amount of quantum algorithms for data-driven decision making, a problem with many potential applications. This paper discusses the recent advances in Quantum Machine learning and how it is serving as an AI accelerator.

Keywords: *Machine Learning, Artificial Intelligence, Deep Leaning, Quantum Computing, Super intelligence*

I. INTRODUCTION

Machine Learning is a field of artificial intelligence in which a set of algorithms and training sets can teach a computer to learn and then to independently perform a particular set of tasks. These thinking machines are now at the stage of pitting their wits against human opponents. Interest in machine learning with tensor networks has been growing rapidly in recent years. (Klus & Gelß, 2019) The accuracy of any machine learning potential can only be as good as the data used in the fitting process. The most efficient model therefore selects the training data that will yield the highest accuracy compared to the cost of obtaining the training data.

Artificial intelligence has permeated all aspects of our lives today. However, to make AI behave like real AI, the critical bottleneck lies in the speed of computing. Quantum computers employ the peculiar and

---

*   Vikram Singh Sankhala, Assistant Professor, NMIMS, Mumbai
**   Dr. Shalini Singh, Consultant - Strategy, Innovation & Entrepreneurship, BIMTECH, Greater Noida