



Department of Computer Science

Quantum Computing and Future Networking – Progress Prospects and Challenges

Moshiur Rahman, Ph.D.
AT&T Labs

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Abstract: Quantum physics is one of the most successful theories in modern science that explains how the world works at the most fundamental level. Quantum Computing has become one of the leading applications in Quantum Physics. Quantum Computers have the potential to solve some of the world's most complex problems that are beyond the reach of today's even most powerful supercomputers. Quantum mechanics is the foundation of quantum computing. While building quantum computers capable of outperforming conventional ones on useful problems will require very large networks of qubits, a handful would be needed to build useful communication networks. The main advantages of a quantum communication network over a conventional one are speed and security. The talk first centers around the very fundamentals of Quantum Computing and Quantum Networking and then provides some observations on their (Quantum Computing and Quantum Networking) Progress, Prospects and Challenges. This talk also sheds some light on the research and innovation opportunities in Quantum Computing and Networking.

Bio: Dr Moshiur Rahman is a Principal Scientist in AT&T Labs. Dr Rahman joined AT&T Bell Labs, Digital Switching & Signaling Division, in 1987. He currently leads the AT&T Operations Machine Learning and automation team in the advanced wireless communications division. During his career, Dr Rahman has worked in different research areas within AT&T, including Switching, signaling, wireless communications, virtualization and analytics. His current research areas include advanced analytics, future wireless communications (6G) and Quantum Machine Learning. He is one of the lead inventors in AT&T research and has 74 patents granted and more than 310 patent disclosures.

He received an MS in Electrical and Computer Engineering from Michigan and a Ph.D. in EE (Wireless IP Mobility) from Stevens Institute.

He is an Adjunct Professor at Stevens Institute of Technology, and NJIT, teaching graduate courses in Computer Science, i) Quantum Computing and ii) TCP/IP Networking -client server programming. Reading, travelling and fishing are some of his hobbies. He is actively involved in many charity programs nationally and internationally. He helped establish a Women College in a remote area of Asia (Bangladesh) in 2010 and the local people named the college after him (Dr Moshiur Rahman Women College).