Northeastern University

SEMINAR
Quantum Materials and Sensing Institute (QMSI)

"Quantum Machine Learning with MATLAB"

Dr. Hossein Jooya
MathWorks

Friday, Sept 12, 2025, 10:30 AM-11:30 AM
Venue: QMSI Conference Room, Elliott Hall, Burlington Campus
145 South Bedford St, Burlington, MA

The seminar is both in person and Online

Abstract:

This talk explores practical approaches to quantum machine learning using MATLAB, with an emphasis on integration with quantum hardware platforms such as Amazon Braket and IBM Quantum Processor Units (QPUs). Topics include the fundamentals of quantum computing, criteria for selecting between classical (CPU, GPU) and quantum (QPU) processors, and methods for translating classical algorithms into quantum circuits. The presentation also addresses techniques for encoding numerical and image data onto QPUs, quantum optimization, and the implementation of quantum neural networks. Applications and challenges relevant to contemporary machine learning will be discussed throughout.

Bio:
Dr. Jooya is the Head of Chemistry at MathWorks, leading strategic and technical initiatives at the intersection of AI, drug discovery, and materials design. Dr Jooya has deep expertise in theoretical and computational chemistry, artificial intelligence, and molecular discovery. Currently serving as Head of Chemistry at MathWorks. Before MathWorks, Dr. Jooya did postdoctoral research at ITAMP–Harvard University and a Ph.D. from The University of Kansas. Dr. Jooya has built a career developing cutting-edge computational methods and translating them into practical solutions across academia and industry. Their work integrates cheminformatics, molecular modeling, quantum computing, and deep learning architectures to accelerate molecular property prediction, structure–activity relationship modeling, and next-generation simulation pipelines.