MathWorks® Week at Northeastern University

Join MathWorks engineers and Northeastern faculty for these insightful seminars in Climate Change, Quantum Computing, and AI

Climate, Energy and the Built Environment

Tuesday, March 1, 10:30 am - 11:30 am

To register: MathWorksNUSymposiumClimate.eventbrite.com
For more information: Individual event flyer

Chemistry, Deep Learning and Quantum Computing

Thursday, March 3, 3 pm - 4 pm

To register: MathWorksNUSymposiumQuantumComputing.eventbrite.com
For more information: Individual event flyer

AI for Humans

Friday, March 4, 11 am - 12 pm

To register: MathWorksNUSymposiumAI.eventbrite.com
For more information: Individual event flyer

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Insights of climate changes from the Common Era: an Artificial Intelligence view

Jianghao Wang, MathWorks

The rapid global warming seen in observations over the past 150 years shows nearly global coherence, the spatiotemporal coherence of climate epochs earlier in the Common Era (the past 2,000 years), however, has yet to be robustly tested. Understanding how the climate system works and how historical temperature changes shed light on the study of anthropogenic climate change.

Modeling the Stochastic Dynamics of Rotating Wind Turbine Blades

Luca Caracoglia, Professor, Dept. of Civil and Environmental Engineering

This presentation describes the results of recent research activities, examining the dynamic modeling of wind turbine blades under the influence of various sources of input error and noise. The presentation will focus on the flutter phenomenon. Flutter is a flow-induced dynamic instability that results from the coupling between flap-wise bending mode and torsional mode of the rotating blade.

Locating Damage in Structural Systems

Dennis Bernal, Professor, Dept. of Civil and Environmental Engineering

This presentation outlines the basic ideas behind some techniques used to localize damage applicable in cases where the structure is large, and the number of sensors is small. Visual inspection has been the traditional procedure used to check the condition of structural systems but there is significant interest in devising ways to replace or enhance this approach by incorporating information from sensors.

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Graph Neural Networks for Chemistry Using MATLAB

Hossein Jooya, MathWorks

MATLAB's new features in handling chemical structures, from small organic molecules to proteins will be demonstrated. Graph-convolutional (GC) and graph-attention (GA) networks are explained with various examples from toxicity prediction to molecular optimization. Attendees will have access to the shared code modules and can adopt them for their own research with hand-in-hand support from MathWorks technical team.

Photonic Quantum Technologies

Sunil Mittal, Professor, Dept. of Electrical and Computer Engineering

This talk will discuss the generation, manipulation, and measurements of quantum states of light, such as entangled photons, for applications in photonic quantum computation, quantum communications, and sensing.

Do You Trust Your Quantum Computers with Correct Answers?

Devesh Tiwari, Professor, Dept. of Electrical and Computer Engineering

Noisy Intermediate-Scale Quantum (NISQ) machines are increasingly being used to develop quantum algorithms and establish use cases for quantum computing. These devices, however, are highly error-prone and produce output which can be far from the correct output of the quantum algorithm. This talk will discuss some promising approach towards estimating the correct program output on erroneous quantum devices.

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Fundamentals of AI

Neha Sardesai, MathWorks

How to apply machine learning and deep learning to images and signals. You'll see how MATLAB® provides an environment to apply advanced techniques without requiring coding or experience in machine learning and deep learning.

Invariant Representation Learning for Human Pose Estimation with Small Data

Sarah Ostadabbas, Professor, Dept. of Electrical and Computer Engineering

Descriptions of the state-of-the-art representation learning algorithms for visual perception tasks in the contexts of human pose estimation, especially when we are facing problems where data collection or labeling is expensive (i.e. Small Data domains).

Machine learning for retina image analysis for Retinopathy of Prematurity (ROP) severity assessment.

Deniz Erdogmus, Professor, Dept. of Electrical and Computer Engineering

Discussion of the use of active learning, deep learning, and Siamese neural networks to develop deep neural network models for automated retina image analysis to diagnose and assess the severity of retinopathy of prematurity in babies born prematurely.

Register here: MathWorksNUSymposiumAI.eventbrite.com