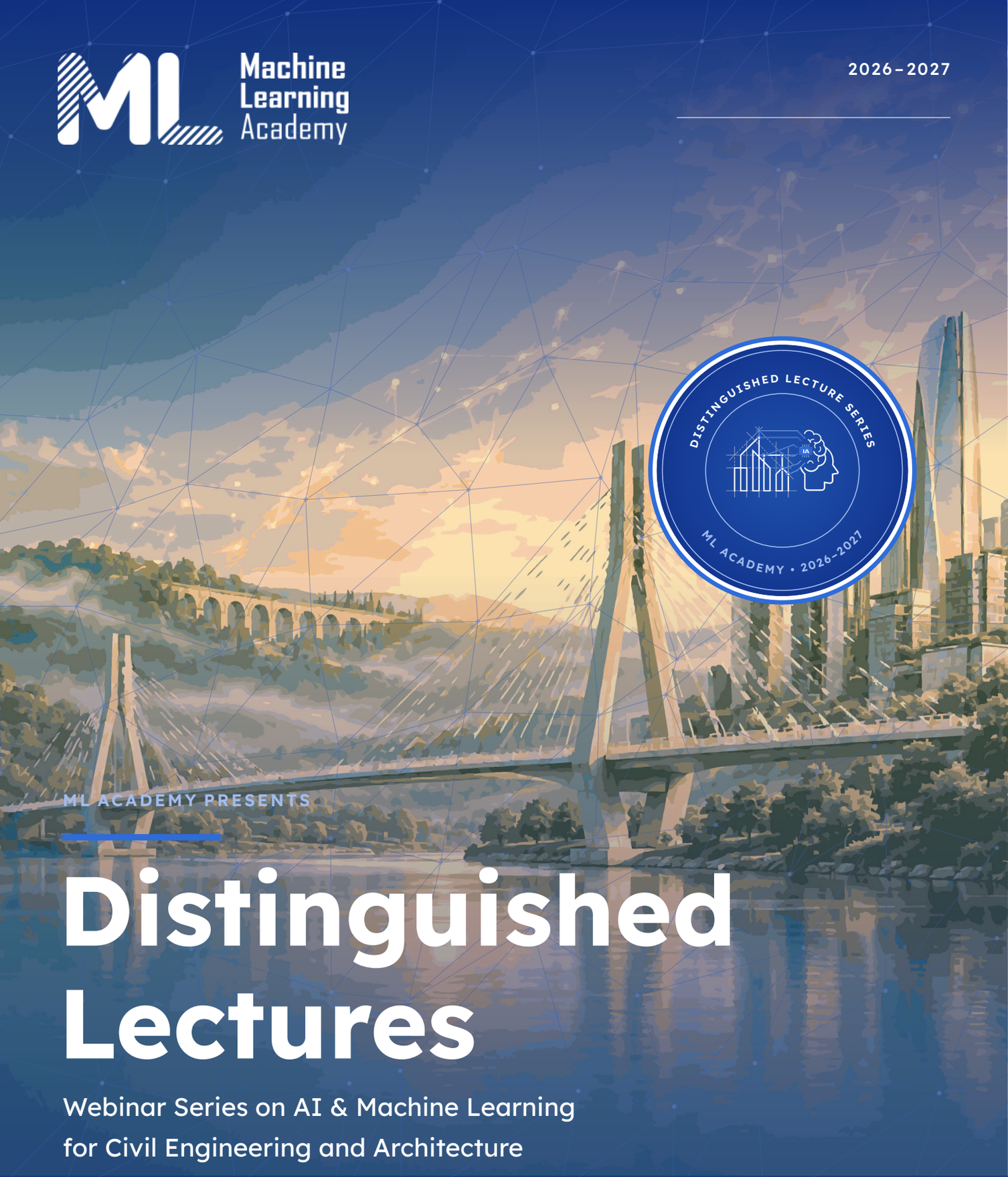
Machine Learning Academy

2026–2027



ML ACADEMY PRESENTS

Distinguished Lectures

Webinar Series on AI & Machine Learning for Civil Engineering and Architecture

NOVEMBER 2026 – FEBRUARY 2027

Seven lectures by leading international experts

S. L. Brunton • S. Laflamme • O. Fink • M. Z. Naser • B. F. Spencer Jr. • X. Lu • J. E. Padgett

Live online on Zoom | **Free & open to all** | **Registration on CASSYNI required**

Scan to register for free

Lectures are online and free; registration on CASSYNI is required to attend. Scan the code to see all lectures.

www.mlacademy.net • info@mlacademy.net

AN INITIATIVE OF

Machine Learning Academy

STREAMED ON

zoom

CASSYNI Research seminars

Machine Learning Academy

ABOUT US

ML Academy



WHO WE ARE

Machine Learning Academy is an international educational initiative, born in 2025, that brings machine learning and AI into university teaching, doctoral training and research dissemination for civil engineering and architecture. It is run by a network of professors from Italian and European universities and offers PhD courses from first principles to advanced AI applications, combining expert lectures with hands-on coding on real datasets. Our ambition is to build a lasting international community in which physical consistency, interpretability and uncertainty quantification remain central to responsible applications of AI.

A SUCCESSFUL FALL SCHOOL

The 2nd international course, the ML Academy Fall School Rome 2026, was hosted by Roma Tre University and brought together more than 100 students: MSc and PhD students, postdocs, researchers and practitioners from many backgrounds, in an intensive programme of lectures, hands-on coding on real datasets and a hackathon. The turnout and the enthusiasm of the participants made it a great success, and it is the best proof that a community around machine learning for civil engineering and architecture is growing.

THE JOURNEY CONTINUES ONLINE

Distinguished Lectures Webinar Series

Following the course, from November 2026 to February 2027 seven leading international experts present the latest advances of AI and machine learning for civil engineering and architecture. The lectures are live on Zoom, free and open to everyone; registration on CASSYNI is required to attend.

REUNATECH

A PRECIOUS COLLABORATION

We are very grateful to REUNATECH for the precious collaboration: the Fall School was organised within the network. REUNATECH is a Marie Skłodowska-Curie Doctoral Network funded by the EU under Horizon Europe (GA 101225914, 2025 – 2029), coordinated by RWTH Aachen University with six beneficiaries, including Roma Tre University. It trains 13 doctoral candidates on NaTech events (natural hazards triggering technological accidents) through multi-hazard risk assessment, real-time digital tools and resilience-based design.

reunatech.rwth-aachen.de

CASSYNI Research seminars

OUR WEBINAR PLATFORM

CASSYNI is a platform dedicated to research seminars. Our Distinguished Lectures are hosted on the CASSYNI series page, where you can browse the programme and register for free for each lecture: registration is required to attend the live sessions on Zoom.

cassyni.com/s/mlacademy-2026

SCAN TO REGISTER

THE ML ACADEMY FOUNDERS • THE PROPOSING GROUP



Cristoforo Demartino
Associate Professor
Roma Tre University



Giuseppe Quaranta
Associate Professor
Sapienza Univ. of Rome



Marco Martino Rosso
Assistant Professor
Aarhus University



Marco Broccardo
Associate Professor
University of Trento



Gianluca Quinci
Assistant Professor
Roma Tre University



Ilaria Venanzi
Associate Professor
University of Perugia

Machine Learning Academy

ML ACADEMY • 2026–2027

Distinguished Lectures

AI & Machine Learning for Civil Engineering and Architecture

Live online on Zoom | Free & registration on CASSYNI required | November 2026 – February 2027



TUE 10 NOV 2026 — 17:00 CET

Steven L. Brunton

University of Washington, USA

AI for Engineering

17:00 ROME • 08:00 CALIFORNIA • 00:00 BEIJING

Moderator: Prof. Giuseppe Quaranta (Sapienza)

SCAN TO REGISTER



MON 30 NOV 2026 — 15:00 CET

Simon Laflamme

Iowa State University, USA

Artificial Intelligence to Support Real-Time Decision Systems in Structural Health Monitoring

15:00 ROME • 06:00 CALIFORNIA • 22:00 BEIJING

Moderator: Prof. Gianluca Quinci (Roma Tre)

SCAN TO REGISTER



THU 3 DEC 2026 — 14:00 CET

Olga Fink

EPFL, Switzerland

Physical AI for Engineered Systems: Integrating Physics and Structure into Machine Learning

14:00 ROME • 05:00 CALIFORNIA • 21:00 BEIJING

Moderator: Prof. Cristoforo Demartino (Roma Tre)

SCAN TO REGISTER



TUE 15 DEC 2026 — 15:00 CET

M. Z. Naser

Clemson University, USA

Integrating Machine Learning into Building Codes: Establishing Equivalence through Causality and Intuition

15:00 ROME • 06:00 CALIFORNIA • 22:00 BEIJING

Moderator: Prof. Cristoforo Demartino (Roma Tre)

SCAN TO REGISTER



MON 11 JAN 2027 — 14:00 CET

Billie F. Spencer Jr.

University of Illinois Urbana-Champaign, USA

Rapid Post-earthquake Inspection and Evaluation of Civil Infrastructure

14:00 ROME • 05:00 CALIFORNIA • 21:00 BEIJING

Moderator: Prof. Ilaria Venanzi (Univ. of Perugia)

SCAN TO REGISTER



WED 3 FEB 2027 — 12:00 CET

Xinzheng Lu

Tsinghua University, China

Generative AI-Driven Engineering Design Methods and Applications

12:00 ROME • 03:00 CALIFORNIA • 19:00 BEIJING

Moderator: Prof. Marco Martino Rosso (Aarhus Univ.)

SCAN TO REGISTER



WED 17 FEB 2027 — 16:00 CET

Jamie E. Padgett

Rice University, USA

AI and ML for Multi-Hazard Infrastructure Risk and Resilience Assessment

16:00 ROME • 07:00 CALIFORNIA • 23:00 BEIJING

Moderator: Prof. Marco Broccardo (Univ. of Trento)

SCAN TO REGISTER

ALL LECTURES

Join us online!

Lectures are online and free, but registration on CASSYNI is required to attend. Scan a QR code to register, or visit www.mlacademy.net

info@mlacademy.net

Times: Rome (CET), California (PST), Beijing. Dates may change: check www.mlacademy.net for updates.

AN INITIATIVE OF: Machine Learning Academy

STREAMED ON: zoom

REGISTER ON: CASSYNI Research seminars

Machine Learning Academy



Prof. Steven L. Brunton
University of Washington, USA

ML ACADEMY

Distinguished Lecture Series

AI for Engineering

Abstract: This work will discuss several key challenges and opportunities in the use of machine learning for nonlinear system identification. In particular, I will describe how machine learning may be used to develop accurate and efficient nonlinear dynamical systems models for complex natural and engineered systems. I will emphasize the need for interpretable and generalizable data-driven models, such as the sparse identification of nonlinear dynamics (SINDy) algorithm, which identifies a minimal dynamical system model that balances model complexity with accuracy, avoiding overfitting. I will also introduce several key benchmark problems in dynamical systems and fluid dynamics that provide a diversity of metrics to assess modern system identification techniques. Because fluid dynamics is central to transportation, health, and defense systems, we will emphasize the importance of machine learning solutions that are interpretable, explainable, generalizable, and that respect known physics.

Bio: Steven L. Brunton is Professor of Mechanical Engineering at the University of Washington, Adjunct Professor of Applied Mathematics and Computer Science, Data Science Fellow at the eScience Institute and Director of the NSF AI Institute in Dynamic Systems. He received his B.S. in mathematics from Caltech (2006) and his Ph.D. in mechanical and aerospace engineering from Princeton (2012). A recipient of the PECASE and of the Army and Air Force Young Investigator awards, he has co-authored five textbooks and over 200 publications, mentored more than 30 PhD students and 15 postdocs, and teaches mathematics to engineers on his popular YouTube channel “eigensteve”.

The ambition of ML Academy is to build a lasting international community where machine learning and engineering, and architecture evolve together, with physical consistency, interpretability, and uncertainty quantification remaining central to responsible applications of AI.

TUE
10
NOV 2026

ONLINE STREAMING ON zoom • FREE • REGISTRATION ON CASSYNI REQUIRED

17:00	00:00	08:00
ROME • CET	BEIJING • 11 NOV	CALIFORNIA • PST

MODERATOR **Prof. Giuseppe Quaranta** (Sapienza University of Rome)

www.mlacademy.net **info@mlacademy.net**

SCAN TO REGISTER

CASSYNI Research seminars

Machine Learning Academy



Prof. Simon Laflamme
Iowa State University, USA

ML ACADEMY

Distinguished Lecture Series

Artificial Intelligence to Support Real-Time Decision Systems in Structural Health Monitoring

Abstract: Artificial Intelligence (AI) excels at processing vast datasets, discovering hidden patterns, and directly mapping inputs to actionable decisions. These capabilities make AI a promising tool for tackling complex engineering challenges, such as Structural Health Monitoring (SHM), known as the automated assessment of civil, mechanical, and aerospace infrastructure using sensor data. Because large and complex structures are difficult to model using traditional physics-based approaches, data-driven AI offers a powerful alternative for field applications. This lecture discusses how AI can play a role in supporting SHM decision systems. Of interest are low-latency methods, or how AI models can be adapted in empowering real-time decision making, through physics-enhanced machine learning. High-rate dynamic systems are used as an example, where decision systems require sub-millisecond capabilities. Finally, we outline a roadmap to field deployment of AI for rapid SHM.

Bio: Simon Laflamme is the Waldo W. Wegner Professor in Civil Engineering and Director of Research in the Department of Civil, Construction, and Environmental Engineering at Iowa State University, with a courtesy appointment in Electrical and Computer Engineering. He received his Ph.D. in Structures and Materials from MIT in 2011. His research on smart structures, structural control and structural health monitoring has produced a textbook on Structural Motion Engineering, five U.S. patents and more than 300 articles. He is a Fellow of the Institute of Physics, has received Iowa State's early-, mid-career and outstanding research achievement awards, and serves on editorial boards including Mechanical Systems and Signal Processing.

The ambition of ML Academy is to build a lasting international community where machine learning and engineering, and architecture evolve together, with physical consistency, interpretability, and uncertainty quantification remaining central to responsible applications of AI.

MON
30
NOV 2026

ONLINE STREAMING ON zoom • FREE • REGISTRATION ON CASSYNI REQUIRED

15:00	22:00	06:00
ROME • CET	BEIJING	CALIFORNIA • PST

MODERATOR **Prof. Gianluca Quinci** (Roma Tre University)

www.mlacademy.net **info@mlacademy.net**

SCAN TO REGISTER

CASSYNI Research seminars

Machine Learning Academy



Prof. Olga Fink
EPFL, Switzerland

ML ACADEMY

Distinguished Lecture Series

Physical AI for Engineered Systems: Integrating Physics and Structure into Machine Learning

Abstract: Machine learning offers new ways to model engineered systems, yet measurements often reveal only part of their behaviour. Internal forces, mechanical response, and thermal properties may remain unobserved, while available data can be sparse, noisy, or incomplete. A central challenge is therefore to learn models that both predict system evolution and infer the physical quantities underlying observed behaviour. This talk explores how physical principles, system structure, and engineering knowledge can be incorporated as inductive biases in model architectures and learning algorithms. These choices shape how models represent interactions, generate predictions, and connect observations to unobserved quantities. In mechanically structured graph networks, for example, learned momentum exchanges and response operators directly drive the predicted dynamics, making internal mechanical quantities accessible for analysis without requiring their supervision during training. Examples will focus on physics-informed graph neural networks, graph neural simulators combining learned mechanical interactions with semi-implicit integration and system-wide coupling, thermal inference from multimodal image measurements, and symbolic regression for discovering governing relationships.

Bio: Olga Fink heads the Intelligent Maintenance and Operations Systems (IMOS) laboratory at EPFL, where she has been a professor since March 2022, and holds an ERC Consolidator Grant. Her research focuses on physics-informed machine learning, multi-modal learning, domain adaptation and generalization, and reinforcement learning for the intelligent maintenance and operation of infrastructure and complex assets. She was previously SNSF Professor of Intelligent Maintenance Systems at ETH Zurich (2018–2022) and head of the Smart Maintenance group at ZHAW. She holds a Ph.D. from ETH Zurich and gained industrial experience at Stadler Bussnang AG and Pöyry Switzerland.

The ambition of ML Academy is to build a lasting international community where machine learning and engineering, and architecture evolve together, with physical consistency, interpretability, and uncertainty quantification remaining central to responsible applications of AI.

THU
3
DEC 2026

ONLINE STREAMING ON zoom • FREE • REGISTRATION ON CASSYNI REQUIRED

14:00	21:00	05:00
ROME • CET	BEIJING	CALIFORNIA • PST

MODERATOR **Prof. Cristoforo Demartino** (Roma Tre University)

www.mlacademy.net **info@mlacademy.net**

SCAN TO REGISTER

CASSYNI Research seminars

Machine Learning Academy



Prof. M. Z. Naser
Clemson University, USA

ML ACADEMY

Distinguished Lecture Series

Integrating Machine Learning into Building Codes: Establishing Equivalence through Causality and Intuition

Abstract: The traditional approach to formulating building codes is often slow, labor-intensive, and may struggle to keep pace with the rapid evolution of technology and domain findings. Overcoming such challenges necessitates a methodology that streamlines the modernization of codal provisions. This seminar proposes a machine learning (ML) approach to append a variety of codal provisions, including those of empirical, statistical, and theoretical nature. In this approach, a codal provision (i.e., equation) is analyzed to trace its properties (e.g., engineering intuition and causal logic). Then a ML model is tailored to preserve the same properties and satisfy a collection of similarity and performance measures until declared equivalent to the provision at hand. The resulting ML model harnesses the predictive capabilities of ML while arriving at predictions similar to the codal provision used to train the ML model, and hence, it becomes possible to adopt in line with the codal expression. This approach has been successfully examined on seven structural engineering phenomena contained within various building codes, including those in North America and Australia. Our findings suggest that the proposed approach could lay the groundwork for implementing ML in the development of future building codes.

Bio: M. Z. Naser is an Associate Professor in the School of Civil and Environmental Engineering and Earth Sciences and a member of the Artificial Intelligence Research Institute for Science and Engineering (AIRISE) at Clemson University. His research group develops causal and LLM-based machine learning methodologies to discover new knowledge hidden within systems in engineering and philosophy. He chairs the ASCE Advances in Technology committee and, since 2022, has been listed among the top 2% most-cited scientists worldwide in the Elsevier–Stanford study.

The ambition of ML Academy is to build a lasting international community where machine learning and engineering, and architecture evolve together, with physical consistency, interpretability, and uncertainty quantification remaining central to responsible applications of AI.

TUE
15
DEC 2026

ONLINE STREAMING ON zoom • FREE • REGISTRATION ON CASSYNI REQUIRED

15:00	22:00	06:00
ROME • CET	BEIJING	CALIFORNIA • PST

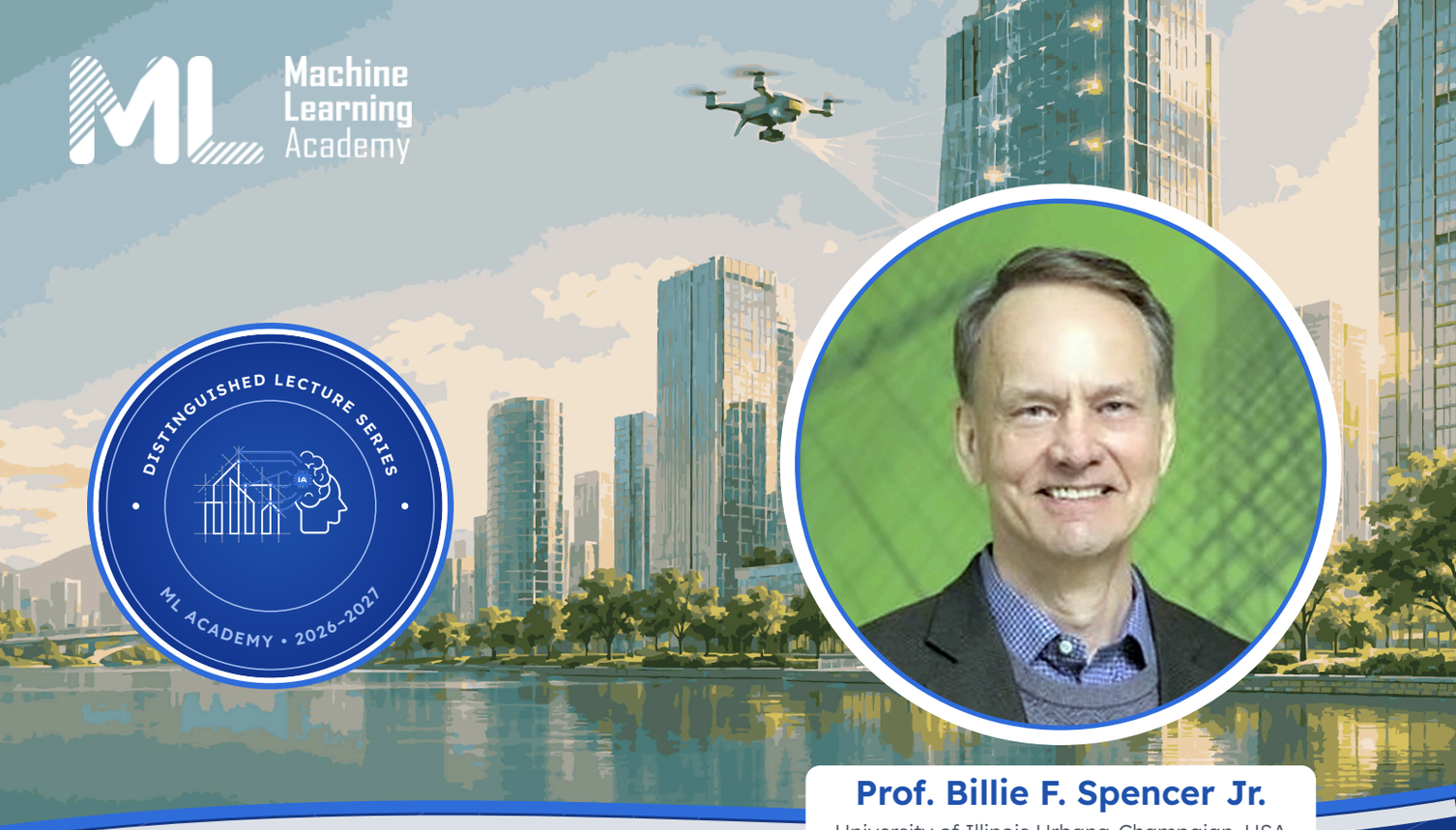
MODERATOR **Prof. Cristoforo Demartino** (Roma Tre University)

www.mlacademy.net **info@mlacademy.net**

SCAN TO REGISTER

CASSYNI Research seminars

Machine Learning Academy



Prof. Billie F. Spencer Jr.
University of Illinois Urbana-Champaign, USA

ML ACADEMY

Distinguished Lecture Series

Rapid Post-earthquake Inspection and Evaluation of Civil Infrastructure

Abstract: In the aftermath of an earthquake, rapid structural inspection and evaluation are critical to ensure that the normal order of life, work, and production can be restored quickly. To date, initial assessments of structures are based on visual information collected manually by certified inspectors and are known to be time-consuming, dangerous, and subjective. Moreover, the number of inspectors in an earthquake affected region may be limited, further delaying efforts to conduct these initial inspections. This lecture presents two recently proposed approaches for automated rapid post-earthquake safety assessment. The first approach employs sparse acceleration measurements to define damage-sensitive features that can be used to infer the condition of buildings. A convolutional neural network is then employed to uncover the complex relationship between the damage-sensitive features and the building condition. The proposed framework is validated experimentally using a 1/3-scale 18-story experimental steel building tested on the shaking table at E-Defense in Japan, confirming the efficacy of the proposed approach for rapid post-earthquake safety evaluation for high-rise buildings. Subsequently, a comprehensive strategy for rapid post-earthquake inspection and evaluation using images collected by commercial unmanned aerial vehicles (UAVs) is presented. The proposed approach employs a graphics-based digital twin (GBDT), which is comprised of a finite element (FE) model and a photo-realistic computer graphics (CG) model. The approach is illustrated for a 45-story high-rise building in Guangzhou, China. These results will enable rapid evaluation of inspection strategies and efficient decision making in the aftermath of an earthquake.

Bio: B. F. (Bill) Spencer Jr. is the Nathan M. and Anne M. Newmark Endowed Chair in Civil Engineering at the University of Illinois Urbana-Champaign, where he directs the Smart Structures Technology Laboratory and the Multi-Axial Full-Scale Sub-Structured Testing & Simulation facility. He received his B.S. in mechanical engineering from the University of Missouri-Rolla (1981) and his M.S. (1983) and Ph.D. (1985) in theoretical and applied mechanics from the University of Illinois. His research covers structural health monitoring, structural control, smart wireless sensor technology, stochastic mechanics and earthquake engineering. His honours include the ASCE Housner Structural Control and Monitoring Medal (2015) and the J. M. Ko Medal (2014); he is a Distinguished Member of ASCE and a foreign member of the Polish Academy of Sciences, the Chinese Academy of Engineering and the Engineering Academy of Japan.

The ambition of ML Academy is to build a lasting international community where machine learning and engineering, and architecture evolve together, with physical consistency, interpretability, and uncertainty quantification remaining central to responsible applications of AI.

MON
11
JAN 2027

ONLINE STREAMING ON zoom • FREE • REGISTRATION ON CASSYNI REQUIRED

14:00	21:00	05:00
ROME • CET	BEIJING	CALIFORNIA • PST

MODERATOR **Prof. Ilaria Venanzi** (University of Perugia)

www.mlacademy.net **info@mlacademy.net**

SCAN TO REGISTER

CASSYNI Research seminars

Machine Learning Academy



Prof. Xinzheng Lu
Tsinghua University, China

ML ACADEMY

Distinguished Lecture Series

Generative AI-Driven Engineering Design Methods and Applications

Abstract: Generative AI is becoming a key technology of intelligent engineering design, addressing the heavy reliance on expert experience, costly multidisciplinary coordination, and inefficient design iteration. This presentation introduces generative AI methodologies and applications in building structures, earth-rock dams, fire protection, bridges, and photovoltaic supports. The proposed framework integrates engineering data, domain knowledge, and mechanics through diffusion models, generative adversarial networks, graph neural networks, and multimodal large language models. It incorporates empirical knowledge from engineering drawings, design-code constraints, and structural performance indicators into a closed-loop workflow of scheme generation, performance verification, and iterative optimization. For residential buildings, the system supports component layout, section sizing, and model generation; for earth-rock dams, it enables zoning design and stability assessment. Case studies show that AI-generated schemes can approach expert-designed solutions and satisfy preliminary design requirements, while improving design efficiency, code compliance, and structural safety across diverse project types and stages of real-world engineering practice.

Bio: Xinzheng Lu is a Professor in the Department of Civil Engineering at Tsinghua University and Editor of *Earthquake Engineering & Structural Dynamics*. His research focuses on AI-enabled engineering design, earthquake engineering, and disaster prevention and mitigation. He has published more than 200 international journal papers and eight books (over 20,000 citations) and has been an Elsevier Highly Cited Chinese Researcher for twelve consecutive years (2014–2025). His work has contributed to design codes, disaster simulation platforms, structural analysis software and major engineering projects; his honours include the National Natural Science Award of China, the XPLORER PRIZE and the J. M. Ko Award.

The ambition of ML Academy is to build a lasting international community where machine learning and engineering, and architecture evolve together, with physical consistency, interpretability, and uncertainty quantification remaining central to responsible applications of AI.

WED
3
FEB 2027

ONLINE STREAMING ON zoom • FREE • REGISTRATION ON CASSYNI REQUIRED

12:00	19:00	03:00
ROME • CET	BEIJING	CALIFORNIA • PST

MODERATOR **Prof. Marco Martino Rosso** (Aarhus University)

www.mlacademy.net **info@mlacademy.net**

SCAN TO REGISTER

CASSYNI Research seminars

Machine Learning Academy



Prof. Jamie E. Padgett
Rice University, USA

ML ACADEMY

Distinguished Lecture Series

AI and ML for Multi-Hazard Infrastructure Risk and Resilience Assessment

Abstract: Reliable functioning of structures and infrastructure systems during and after hazards such as hurricanes, floods, and earthquakes is essential to public safety, economic vitality, and quality of life. Assessing and enhancing resilience requires confident predictions of how systems perform across scales, from the loads on individual structures to the recovery of regional networks and the communities they serve. These predictions are constrained by data scarcity, multiple sources of uncertainty, correlated system behavior, and the computational cost of high-fidelity analysis. This lecture examines how artificial intelligence and machine learning can move infrastructure risk and resilience modeling toward a smarter paradigm: one that harnesses emerging data from smart systems, embeds intelligent algorithms in the modeling process, and yields models agile enough to learn and evolve as conditions change, rather than staying fixed in time. Examples span natural and technological threats, coastal infrastructure, structural portfolios, and networked systems. The lecture closes by considering how these methods can transform data-informed resilience planning at the regional scale, guided by principles of intelligence and equity.

Bio: Jamie E. Padgett is the Stanley C. Moore Professor and Department Chair of Civil and Environmental Engineering at Rice University in Houston, TX. A structural engineer, she studies multi-hazard risk and resilience of structural portfolios and infrastructure systems and their impacts on communities. She has held leadership roles in the NIST Center of Excellence for Risk-based Resilience Planning, the NSF NHERI DesignSafe-CI and, as Deputy Director, the Consortium for Enhancing Resilience and Catastrophe Modeling (CERCat). She is a Fellow of ASCE (2025) and SEI (2020); recent honours include the J. M. Ko Award (2025), the Charles Martin Duke Lifeline Earthquake Engineering Award (2024) and the TAMEST Edith and Peter O'Donnell Award (2023).

The ambition of ML Academy is to build a lasting international community where machine learning and engineering, and architecture evolve together, with physical consistency, interpretability, and uncertainty quantification remaining central to responsible applications of AI.

WED
17
FEB 2027

ONLINE STREAMING ON zoom • FREE • REGISTRATION ON CASSYNI REQUIRED

16:00	23:00	07:00
ROME • CET	BEIJING	CALIFORNIA • PST

MODERATOR **Prof. Marco Broccardo** (University of Trento)

www.mlacademy.net **info@mlacademy.net**

SCAN TO REGISTER

CASSYNI Research seminars



Machine Learning Academy

The ambition of ML Academy is to build a lasting international community where machine learning and engineering, and architecture evolve together, with physical consistency, interpretability, and uncertainty quantification remaining central to responsible applications of AI.

Distinguished Lectures Webinar Series • November 2026 – February 2027

Thank you

Join us online

www.mlacademy.net

info@mlacademy.net

cassyni.com/s/mlacademy-2026

AN INITIATIVE OF

Machine Learning Academy

zoom

CASSYNI Research seminars