MIT Industrial Liaison Program Faculty Knowledgebase Report

2024 MIT Paris Symposium

October 17, 2024 9:00 am - 12:30 pm

8:00 AM	Registration and Check-In
9:00 AM	Welcome & Introduction Christophe Lienard Group Chief Innovation Officer, Bouygues

Christophe Lienard
Group Chief Innovation Officer
Bouygues

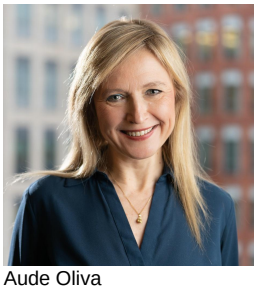
Christophe Lienard joined the Bouygues Group in 2011 and was appointed Chief Innovation Officer for Bouygues SA in September 2017. From 2013 to 2017, he was Chief Innovation Officer at Colas, one of the world leaders in mobility infrastructures, and created and ran the Colas Innovation Board. In October 2015, Colas announced the launch of Wattway to produce photovoltaic energy from roads, which won the climate solution trophy at COP21. Previously, Lienard was Deputy CEO and Director of the Anovo Group from and earlier started his career with the Swedish group Atlas Copco. Lienard is a graduate from “Arts et Métiers ParisTech,” a National Graduate Engineering School engineer, has an advanced degree from UPMC Paris on energy conversion, and an Executive MBA from ICG. He is cofounder of the think tank Futura Mobility, cofounder and Vice President of IMPACT-AI, and a member of the Scientific Committee of the Global Center for the Future.

Olivier J Cadet
Program Director
MIT Industrial Liaison Program

9:15 AM

Navigating AI Impact and Promise Beyond the Hype
Aude Oliva

Director of Strategic Industry Engagement, MIT Schwarzman College of Computing
MIT Director, MIT-IBM Watson AI Lab
Co-lead, MIT AI Hardware Program
Senior Research Scientist, CSAIL



Aude Oliva

Director of Strategic Industry Engagement, MIT Schwarzman College of Computing
MIT Director, MIT-IBM Watson AI Lab
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Senior Research Scientist, CSAIL

Aude Oliva, PhD is the MIT director in the MIT-IBM Watson AI Lab and director of strategic industry engagement in the MIT Schwarzman College of Computing, leading collaborations with industry to translate natural and artificial intelligence research into tools for the wider world. She is also a senior research scientist at the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL), where she heads the Computational Perception and Cognition group.

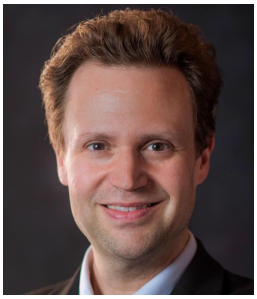
Oliva has received an NSF Career Award in computational neuroscience, a Guggenheim fellowship in computer science and a Vannevar Bush Faculty Fellowship in cognitive neuroscience. She has served as an expert to the NSF Directorate of Computer and Information Science and Engineering on the topic of human and artificial intelligence. She is currently a member of the scientific advisory board for the Allen Institute for Artificial Intelligence. Her research is cross-disciplinary, spanning human perception and cognition, computer vision and cognitive neuroscience, and focuses on research questions at the intersection of all three domains. She earned a MS and PhD in cognitive science from the Institut National Polytechnique de Grenoble, France.

Generative AI presents practical and societal challenges that are swiftly growing as the technology scales and is increasingly used. Generative models — some mimicking human capabilities — can be used alongside people to enhance project outcomes in domains from scientific discovery to products in industry. This talk will present an overview of the state of the art in AI research at MIT, and discuss the impact, promised, and pitfalls of generative approaches for current and future real-world use cases.

9:55 AM

Generative AI for Modeling and Designing New Materials: Connecting Disciplines, Scales, and Modalities
Markus J. Buehler

Jerry McAfee Professor of Engineering, MIT Department of Civil and Environmental Engineering and MIT Department of Mechanical Engineering



Markus J. Buehler

Jerry McAfee Professor of Engineering, MIT Department of Civil and Environmental Engineering and MIT Department of Mechanical Engineering

Dr. Markus J. Buehler, Jerry McAfee Professor of Engineering at MIT, is a leading researcher in computational modeling across domains, from materials to biology to physics. Markus' expertise bridges AI to multi scale materials modeling. He recently co-developed a method that uses artificial intelligence to generate new protein designs with specific strengths, mimicking natural materials like silk. This approach, which uses computer simulations for testing, allows the creation of proteins with desired mechanical properties, such as strength and flexibility, beyond what is naturally available. Markus earned a Ph.D. at the Max Planck Institute for Metals Research at the University of Stuttgart and held post-doctoral appointments at both Caltech and MIT. Buehler has received many awards, including the Feynman Prize, the Drucker Medal, and the Washington Award. He is a member of the National Academy of Engineering.

View full bio

In this talk, Prof. Buehler will explore the cutting-edge intersection of materials science, biology, and artificial intelligence. Generative AI models have the potential to revolutionize the way we understand, analyze, and design new materials. However, many AI models struggle to understand physical concepts, causing the models to "hallucinate," producing unreliable or even erroneous results. This talk discusses research that addresses these challenges by blurring the boundary between physics-based and data-driven modeling through a series of physics-inspired multimodal graph-based generative AI models set in a hierarchical multi-agent mixture-of-experts framework. We apply this new generation of models in the analysis and design of materials to mimic and improve upon biological materials. Focusing specifically on protein engineering, this talk discusses case studies covering distinct scales, from silk to collagen to biomineralized materials, as well as applications for medicine, food, and agriculture where materials design is critical to achieving performance targets. By harnessing AI's creative power for designing novel proteins, Prof. Buehler's research has opened new avenues in biomedicine, construction, and sustainability. This talk will journey into the future of materials science, demonstrating how generative AI's potential to solve complex challenges is just beginning to be unlocked.

10:35 AM

Networking Break

11:00 AM

Making Business Sense of AI: Key Questions for Leaders
George Westerman

Senior Lecturer, MIT Sloan School of Management
Founder, Global Opportunity Forum, MIT Office of Open Learning

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Founder, Global Opportunity Forum, MIT Office of Open Learning

Dr. George Westerman is a Senior Lecturer and Principal Research Scientist at the MIT Sloan School of Management. He helps executives understand how to help their companies thrive in a world of fast-moving technological change. As a pioneering research on digital transformation, he co-authored the award winning book Leading Digital: Turning Technology into Business Transformation. Another book, The Real Business of IT: How CIOs Create and Communicate Value, serves as the basis for the MIT Sloan CIO Leadership Award program, which he co-chairs. His recent research on workforce learning, innovation culture, and AI transformation provides tangible insights to lead successful AI transformation.

George is a digital strategy advisor to the US Library of Congress, Board of Directors member for workforce non-profit WorkCred, and advisor to executives in numerous large corporations. Prior to earning a doctorate in innovation strategy from Harvard Business School, he gained more than a decade of experience in product development and technology leadership roles.

View full bio

In today's business environment, every leader must consider the potential of artificial intelligence (AI). However, not every leader feels comfortable doing that. In this engaging session, MIT researcher and digital transformation pioneer George Westerman will provide the information you need to talk about AI and make informed decisions confidently. He'll demystify AI and provide an executive-level overview of key categories, including generative AI, deep learning, rule-based systems, and other models. Participants will explore practical applications across various sectors, highlighting the transformative potential and potential risks for customer experience, operations, decision-making, and employee careers. This is not a technical discussion; it's a leadership one that reveals what every leader needs to know about these fast-moving technologies. Audiences will walk away ready to ask the right questions and make the right decisions about leading an organization through the AI revolution.

11:40 AM

Roundtable Discussion: AI for Industry: Hype or Revolution?

Vincent Maret

Aude Oliva

Director of Strategic Industry Engagement, MIT Schwarzman College of Computing
MIT Director, MIT-IBM Watson AI Lab
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Sarah Najmark

Stéphane Stoll
Deputy CEO, Central Europe, Data Centers and Energies
Equans

12:25 PM

Closing Remarks

Christophe Lienard
Group Chief Innovation Officer
Bouygues

Olivier J Cadet
Program Director
MIT Industrial Liaison Program