John Roberts has been Executive Director of MIT Corporate Relations (Interim) since February 2022. He obtained his Ph.D. in organic chemistry at MIT and returned to the university after a 20-year career in the pharmaceutical industry, joining the MIT Industrial Liaison Program (ILP) in 2013. Prior to his return, John worked at small, medium, and large companies, holding positions that allowed him to exploit his passions in synthetic chemistry, project leadership, and alliance management while growing his responsibilities for managing others, ultimately as a department head. As a program director at MIT, John built a portfolio of ILP member companies, mostly in the pharmaceutical industry and headquartered in Japan, connecting them to engagement opportunities in the MIT community. Soon after returning to MIT, John began to lead a group of program directors with a combined portfolio of 60-80 global companies. In his current role, John oversees MIT Corporate Relations which houses ILP and MIT Startup Exchange.

Steve Palmer
Program Director, MIT Corporate Relations

Steve Palmer is a Program Director within MIT’s Office of Corporate Relations. Steven comes to OCR with many years of experience building relationships, advancing diplomacy, and seeking new business initiatives in both the public and private sectors. He has spent his career highlighting and translating technological issues for policy makers, engineers, analysts, and business leaders. Steven has worked in government, industry, and academia in the U.S. and abroad. He is also an Executive Coach at MIT Sloan and Harvard Business School. Steven earned his Bachelor of Science at Northeastern University, and his M.B.A. at MIT Sloan where he was in the Fellows Program for Innovation and Global Leadership.
If you point your camera to a scene, and the camera registers nothing meaningful—does it mean that nothing was really there? Hardly! Even if a human observer cannot detect and interpret it, much information may still have been recorded in the pixels. How, then, should one capture and decode it to reveal the hidden scene?

With my research group, we have decoded several challenging scenes with important applications for industry. For example, we have peeked inside integrated circuits non-invasively to work out if their manufactured topology matches the design file; quantified mechanical effects in the retinal fibrous structures and vasculature to forecast glaucoma progression; and measured the particle size distribution in drying powders toward early detection of undesired agglomeration events.

In all these cases, even the most advanced state-of-the-art imaging methods cannot capture the relevant phenomena with sufficient fidelity or economy. It is a unique feature of our work that physical models are explicitly woven into data-driven models. Thus, our algorithms perform well in test cases, and are also interpretable and resilient. We have also demonstrated significant savings: for example, reduction by two orders of magnitude in total scanning and computation time.

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Jinhua Zhao
Director, MIT Mobility Initiative
Associate Professor of City and Transportation Planning
Director, MIT JTL Mobility Lab

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Director, MIT Mobility Initiative
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Jinhua Zhao is the Associate Professor of City and Transportation Planning at the Massachusetts Institute of Technology (MIT). Prof. Zhao brings behavioral science and transportation technology together to shape travel behavior, design mobility system, and reform urban policies. He develops methods to sense, predict, nudge, and regulate travel behavior and designs multimodal mobility systems that integrate automated and shared mobility with public transport. He sees transportation as a language to describe a person, characterize a city, and understand an institution and aims to establish the behavioral foundation for transportation systems and policies.

Prof. Zhao directs the JTL Urban Mobility Lab and Transit Lab at MIT and leads long-term research collaborations with major transportation authorities and operators worldwide, including London, Chicago, Hong Kong, and Singapore. He is the co-director of the Mobility Systems Center of the MIT Energy Initiative, and the director of the MIT Mobility Initiative. He very much enjoys working with students.

View full bio

10:35 AM
Networking Break

10:50 AM
Zachary P Smith
Robert N. Noyce Career Development and Professor of Chemical Engineering
MIT Department of Chemical Engineering
MIT Startup Exchange actively promotes collaboration and partnerships between MIT-connected startups and industry. Qualified startups are those founded and/or led by MIT faculty, staff, or alumni or are based on MIT-licensed technology. Industry participants are principally members of MIT’s Industrial Liaison Program (ILP).

MIT Startup Exchange is a community of over 1,000 MIT-connected startups with roots across MIT departments, labs, and centers; it hosts a robust schedule of startup workshops and showcases and facilitates networking and introductions between startups and corporate executives.

STEX25 is a startup accelerator within MIT Startup Exchange, featuring 25 “industry ready” startups that have proven to be exceptional with early use cases, clients, demos, or partnerships and are poised for significant growth. STEX25 startups receive promotion, travel, and advisory support and are prioritized for meetings with ILP’s 240 member companies.
Jeffrey C. Grossman is the Department Head of Materials Science and Engineering at the Massachusetts Institute of Technology and the Morton and Claire Goulder and Family Professor in Environmental Systems. He received his PhD in theoretical physics from the University of Illinois and performed postdoctoral work at the University of California at Berkeley. In 2009 he joined MIT, where he has developed a research program known for its contributions to energy conversion, energy storage, membranes, and clean-water technologies. He has published more than 200 scientific papers, holds 17 current or pending U.S. patents, and recently co-founded two companies to commercialize novel membranes materials for efficient industrial separations.

Miho Mazereeuw is a landscape architect and architect, who has taught at the Graduate School of Design at Harvard University and the University of Toronto prior to joining the faculty at MIT. As an Arthur W. Wheelwright Fellow, she is completing her forthcoming book entitled Preemptive Design: Disaster and Urban Development along the Pacific Ring of Fire featuring case studies on infrastructure design, multifunctional public space and innovative planning strategies in earthquake prone regions. Her design work on disaster prevention has been exhibited at the Architect's Museum in Tokyo Japan, University of Texas at Austin and de Ark Architecture Center in Leewarden Netherlands.

As a co-director of OPSYS, Mazereeuw is collaborating on a number of projects with international non-profit organizations in the field of disaster reconstruction/prevention and is currently working in Haiti, Japan and Chile. She was formerly an Associate at the Office for Metropolitan Architecture in Rotterdam where she worked on projects in the Latvia, China, Belgium, Russia, Saudi Arabia and Dubai. She has also worked in the offices of Shigeru Ban and Dan Kiley. Mazereeuw completed a Bachelor of Arts with High Honors in Sculpture and Environmental Science at Wesleyan University and her Master in Architecture and in Landscape Architecture with Distinction at the Harvard Graduate School of Design where she was awarded the Janet Darling Webel Prize and the Charles Eliot Traveling Fellowship.
2:50 PM

Engineering Now! Are We Ready?
Franz-Josef Ulm
Professor, Construction Management, Civil and Environmental Engineering
Faculty Director, Concrete Sustainability Hub

Franz-Josef Ulm is a Professor of Civil & Environmental Engineering at the Massachusetts Institute of Technology. A structural Engineer by training, he is the faculty director of the Concrete Sustainability Hub at MIT, an academia-industry partnership between MIT and the North- American Cement and Ready Mix Concrete Industry to advance the industry’s 2050 carbon neutrality goals through sustainable development of resilient solutions from materials scale to infrastructure solutions. He is recognized as a leading expert worldwide in the nanoengineering of concrete and its implementation at the industry scale. He is an elected member of the US National Academy of Engineering, the European Academy of Science and Arts, and the Austrian Academy of Science; and Chief Editor of the Journal of Engineering Mechanics of the American Society of Civil Engineers.

View full bio

Never before have the challenges for engineers been greater and more burning than in the face of climate change, from the energy transition to the sustainable construction of a just society. Will it be possible? In this talk, I will discuss some approaches that all originate from the same idea of preparing us engineers for these challenges and opportunities. With sustainability and resilience at heart, I will advocate that engineers and industries take up the new physical realities in a data-centric way and translate them into engineering solutions; from new multi-functional building materials such as concrete that can store energy, to smartphone-enabled infrastructure sensors and molecularly inspired retrofitting of our urban neighborhoods for more resilience and social justice in the face of climate change. As research continues to advance in all of these areas, it will depend on all of us to break out of our silos (academic, disciplinary, cultural) and translate these emerging approaches into actual sustainable solutions for our societies at large.

3:30 PM

Networking Break
Increased attention has been directed in recent years towards advanced manufacturing systems technologies towards making advances in product quality and productivity under such efforts known as Digital Manufacturing, Smart Manufacturing, and Industry 4.0. This presentation describes an integrated approach to accelerating process development that involves (1) greatly increased understanding and optimization of each unit operation while exploiting process intensification and continuous manufacturing, (2) automated high-throughput microscale technology for fast process R&D, (3) plug-and-play modular systems with integrated control and monitoring to facilitate deployment, (4) dynamic mechanistic models for unit operations for plant-wide simulation and control design, and (5) smart process data analytics to automatically select and apply the best data analytics and machine learning methods for a process dataset based on its characteristics and the user objectives. The strategies are illustrated in applications to monoclonal antibody, vaccine, and gene therapy manufacturing systems.
Making Digital Tangible: Beyond the Metaverse Towards a MATTERverse

Hiroshi Ishii
Jerome B. Wiesner Professor of Media Arts and Sciences
Head of Tangible Media Group
Associate Director, MIT Media Lab

Hiroshi Ishii is the Jerome B. Wiesner Professor of Media Arts and Sciences at the MIT Media Lab. He was named Media Lab Associate Director in May 2008. He is the director of the Tangible Media Group, which he founded in 1995 to pursue new visions in Human-Computer Interaction (HCI): "Tangible Bits" and "Radical Atoms." Ishii and his team have presented their research at a variety of scientific, design, and artistic venues (including ACM SIGCHI, SIGGRAPH, Cooper Hewitt Design Museum, Milan Design Week, Cannes Lions Festival, Aspen Ideas Festival, Industrial Design Society of America, AIGA, Ars Electronica, Centre Pompidou, Victoria and Albert Museum and NTT ICC) emphasizing that the development of a vision requires the rigors of both scientific and artistic review. In 2006 Ishii was elected to the CHI Academy by ACM SIGCHI, and received the SIGCHI Lifetime Research Award in 2019.

Prior to joining the MIT Media Lab, from 1988-1994, Ishii led the CSCW research group at NTT Human Interface Laboratories Japan, where he and his team invented TeamWorkStation and ClearBoard.

Mainstream Human-Computer Interaction (HCI) research today primarily addresses functional concerns – the needs of users, practical applications, and usability evaluation. Tangible Bits and Radical Atoms are driven by a vision at the intersection of the arts and computer science to make the digital tangible.

Tangible Bits and Radical Atoms seek to realize seamless interfaces between humans, digital information, and the physical environment by giving dynamic physical form to digital information and computation. They make bits directly manipulatable and perceptible both in the foreground and background of our consciousness (peripheral awareness).

Our goal is to invent new media for artistic expression, communication, and design, taking advantage of the richness of our human senses and the skills we develop throughout our lifetime of interacting with the physical world, as well as the computational reflection enabled by real-time sensing and digital feedback.

During the past quarter century, our research can be seen as a battle against the Pixel Empire, represented most definitively in the trend of the "metaverse." We believe that augmented physical/digital materials that people can touch and manipulate should be the new media to interact with the digital world instead of pixels in an HMD. We envision the "MATTERverse" as an alternative future of the pixel-oriented metaverse.