The 2025 MIT Systems Adaptability Conference, officially known as the Complex Adaptive Systems (CAS) 2025 Conference, was held from March 5–7, 2025, at MIT in Cambridge, MA. Hosted by MIT System Design and Management (SDM), the event was supported by the New England chapter of INCOSE and the IEEE Smart Cities community. Over 150 participants with significant international participation attended.

Key Highlights

- Theme: Transdisciplinary Systems & Solutions for Adaptability.
- Keynote Speakers: Included Professor John D. Sterman, Professor Ali Jadbabaie, Professor Siqi Zheng, and Dr. Michael Watson.
- **Topics Covered:** Adaptability in complex systems, AI for systems engineering, resilient systems, and emerging technologies.
- Workshops & Panels: Focused on engineering adaptability, autonomy, resilience, and Aldriven solutions.
- Domain Applications: Explored adaptability across healthcare, aerospace, urban planning, agriculture, energy, and telecommunications.

The conference aimed to **expand research boundaries** and foster **collaboration among practitioners and researchers worldwide**.

The keynote speeches at the **2025 MIT Systems Adaptability Conference** covered a range of critical topics related to **complex adaptive systems** and **engineering resilience**. Here are some of the main discussions:

- Climate Change & System Dynamics Professor John D. Sterman presented on the En-ROADS Climate Solutions Simulator, demonstrating how human activities impact global temperatures and how behavioral and policy changes can mitigate greenhouse gas emissions.
- Al & Human Factors in Systems Engineering Steven Smith, Director of Flight Systems at Blue Origin, discussed aircraft safety systems, emphasizing how human factors often contribute to system failures despite well-designed technical solutions.
- Future of Systems Engineering A panel moderated by Professor Olivier de Weck explored INCOSE's 2014 Vision 2025, reflecting on the unpredictability of the future and how systems engineering must adapt to uncertainty.

INCOSE distinguished speakers were:

• Michael Watson, President-Elect INCOSE spoke on Adaptability: A Characteristic of Complex Systems or a Confounding factor of Complexity?

- Amro Farid, President-Elect INCOSE New England Chapter, also representing IEEE Smart Cities), was a plenary speaker, on the topic "Adapting Convergent Systems-of-Systems with Hetero-functional Graph Theory.
- The INCOSE Complex Systems Working Group led a forum on Complex and adaptive systems.

On Wednesday, March 5, the New England Chapter of INCOSE hosted a reception at the MIT Museum. After some delicious hors d'oeuvres and socializing, Mark Vriesenga, BAE Systems Global Tech Fellow spoke on "An Architectural Perspective on Securing AIML-Enabled Systems "

The Co-chairs of the conference were Bryan R. Moser, Massachusetts Institute of Technology and Haifeng Zhu, BAE SYSTEMS and INCOSE Systems Adaptability Working Group.

The conference fostered engaging discussions on adaptability, autonomy, resilience, and Aldriven solutions.



MIT Museum where INCOSE sponsored the reception



Conference Gala Dinner at MIT





Mike Watson, INCOSE President-Elect, gives plenary address



INCOSE Complex Systems Working Group leads a forum on Complex and adaptive systems



Amro Farid, INCOSE New England Chapter President Elect leads a plenary session



Mark Vriesenga, BAE Systems Global Tech fellow speaks at INCOSE sponsored reception



Haifeng Zhu, and past New England INCOSE Chapter President and Conference Co-chair, speaks on Adaptive Complex Systems