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Resilient Robotics: Innovating for Disasters and a Circular Economy

Associate Professor Rafiq Ahmad

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Date: Friday, October 10, 2025 11:00-11:45

Venue: Faculty of Engineering Bldg. 2, Room 31A

Abstract:

Robots are no longer just tools of convenience; they are becoming essential partners in creating resilient societies and sustainable futures. This talk explores how resilient robotics can transform two of humanity's most urgent challenges: disaster response and the transition to a circular economy. From agile robots designed to navigate hazardous environments and save lives, to intelligent systems that enable waste valorization, material recovery, and regenerative production, robotics offers unprecedented opportunities to reimagine resilience. Drawing from cuttingedge research and real-world applications, we will highlight how smart, adaptable robotic systems can mitigate disaster impacts, close resource loops, and empower communities to thrive in the face of uncertainty. Ultimately, this presentation illustrates a vision where robotics innovation not only responds to crises but also drives circularity, sustainability, and hope for a regenerative planet.

Biography:

Dr. Rafiq Ahmad is a pioneering leader in Industrialized Robotics, Smart Manufacturing, and Sustainable Technologies, shaping the future of how we build, live, and explore. As Associate Professor of Mechanical Engineering at the University of Alberta, he founded and directs the Smart & Sustainable Manufacturing Systems Laboratory (SMART Lab) and the Aquaponics 4.0 Learning Factory (AllFactory), living testbeds for Industry 4.0/5.0 innovation. He also serves as one of the Co-Principal Investigators for the Alberta Advanced Manufacturing International (AbAMI) Hub, advancing global collaboration and industrial innovation. His entrepreneurial ventures, including Waste Parrot Inc., recognized by NASA as a global winner of the Lunar Recycling Challenge, demonstrate how robotics and advanced manufacturing can tackle Earth's most urgent challenges while enabling human presence beyond our planet. Honoured with Edify's Top 40 Under 40 (2022) and the ASTech Award for Digital Technology Innovation (2023), Dr. Ahmad is advancing technologies that redefine productivity, sustainability, and resilienceempowering industries, inspiring communities, and driving humanity's journey from Earth to space.

主催：
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