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Engineering Motion Without Contact: Advances in Magnetic Levitation, Microrobotics, and Intelligent Manufacturing Systems

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Abstract

This keynote explores how innovations in electromagnetic actuation, precision control, and intelligent robotic systems are transforming both manufacturing and medicine. Drawing on decades of research, Professor Khamesee will discuss the development of magnetic levitation technologies for high-precision automation, the creation of flexible robotic platforms for next-generation manufacturing, and the translation of microrobotic systems into biomedical applications.

By integrating advances in robotics, materials, sensing, and control, Professor Khamesee's research illustrates how fundamental engineering innovations can create intelligent systems capable of operating with precision and adaptability. The presentation will provide insights into emerging opportunities for magnetic robotics, autonomous manufacturing, and medical technologies that bridge the gap between laboratory research and real-world applications.