

University Day 2026



Adrian Stoica, PhD, Senior Research Scientist, Principal, NASA's Jet Propulsion Laboratory, California Institute of Technology. Dr. Stoica has 35 years of engineering experience, including 25 years in the Autonomous Systems Division at NASA's Jet Propulsion Laboratory, where he has contributed to research in robotic intelligence, autonomy, and planetary exploration. He previously worked in Artificial Intelligence, Computational Intelligence, and Machine Learning for robotic systems.

At JPL, he served as Supervisor of the Robotic Systems, Estimation, Decision and Control Group from 2008 to 2017, leading research in robotics and mobility for Mars and planetary surfaces. His work has also included concepts for lunar solar-energy infrastructure and program management of innovative technology initiatives. He has authored approximately 200 papers, delivered more than 20 keynote presentations, and holds 9 U.S. patents.

Dr. Stoica's research interests include machine intelligence, autonomous unmanned systems and robots, humanoid robotics, space robotics, and human-robot interaction. His PhD research pioneered motion learning by imitation for anthropomorphic robots, contributing to the foundations of approaches that have since become central to humanoid learning.

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ENGINEERING HUMANOID WORKFORCES FOR EARTH AND SPACE

From Learning Human Motion to Building an Ethical Framework Shared by Humans and Humanoids

Humanoid robots are rapidly evolving from research platforms into increasingly capable systems with the potential to work alongside humans in factories, homes, and challenging environments beyond Earth. Advances in artificial intelligence, machine learning, and robotic autonomy are enabling humanoids to acquire increasingly sophisticated skills, including learning from human movements and interacting with people in complex environments.

While Mars represents a long-term destination for human expansion, the Moon may serve as an important stepping stone.

Concepts such as lunar solar-energy infrastructure, including systems capable of providing power to regions in permanent darkness, could require autonomous robotic systems capable of operating in environments where direct human control is difficult or impossible.

However, increasing robotic intelligence raises challenges that extend beyond technical capabilities. Humanoids working alongside humans will require not only physical skills, autonomy, and intelligence, but also mechanisms for trust, collaboration, and coexistence. This creates a new engineering challenge: developing ethical frameworks based on values and principles sufficiently shared between humans and increasingly intelligent machines.