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High-Tech Award of the Bavarian Minister-President 2026 awarded to Professor Daniela Rus, Ph.D., Director of the Computer Science and Artificial Intelligence Laboratory (CSAIL) at MIT, Cambridge, USA

Statement by the Selection Committee
of the Bavarian Academy of Sciences and Humanities

"A pioneer in responsible AI and autonomous systems"

Professor **Daniela Rus** is a world-leading expert in the field of **autonomous systems engineering**. As Director of the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL), Rus is shaping the next generation of intelligent and connected robots. Her research aims to develop flexible, safe technology which integrate seamlessly into people's daily lives. Her groundbreaking work focuses on four key areas – self-organizing robot collectives, soft robots, autonomous mobility, and artificial intelligence inspired by the human brain.

Daniela Rus is a pioneer in the field **of self-organizing robot** collectives. Together with her team, she has developed some of the first modular robots capable of assembling, disassembling, and transforming into different shapes for specific tasks without human intervention. Her "M-Blocks," magnetically connected cubes, can move, climb, and form 3D structures using internal flywheels. In the field of algorithms, Daniela Rus developed some of the first control laws for multi-robots with performance guarantees, enabling a network of robots to position themselves optimally for sensing or surveillance tasks using only local information. This work is of fundamental importance for distributed sensing, environmental monitoring by multi-robots, or search and rescue operations.

In addition, Daniela Rus is considered the founder of modern **soft robotics**. Her flexible, shape-shifting robots and origami robots have completely redefined our concept of robotic bodies, and significantly expanded the range of applications for autonomous systems, for example in sensitive ecosystems or within the human body. Together with her team, she has developed many iconic soft robotic systems, including robotic fish (SoFi) that can visually monitor coral reefs over long periods of time, are acoustically controlled by divers, and are harmless to marine life. For the healthcare sector, Rus has designed minimally-invasive robots, including an origami robot that can be swallowed and unfolds in the stomach to perform medical procedures.

In the field of **autonomous mobility**, Daniela Rus has developed planning and decision-making processes for self-driving vehicles and on-demand mobility systems. Her team integrates methods from social psychology into the decision-making of autonomous vehicles, enabling them to analyze and anticipate the social behavior of road users — a key factor for safe interaction between humans and machines. Her work, however, extends far beyond cars: she has developed algorithms and prototypes for autonomous boats that assemble into floating bridges or platforms and navigate through urban canals, as well as for drones that coordinate in swarms to perform surveillance and

environmental protection tasks. Through her theoretical and practical work in this field, Daniela Rus contributes to solving a central societal challenge of our time: sustainable, efficient, and safe mobility.

A recent research focus of Rus´s research is **AI architecture inspired by the human brain**, which is specifically tailored to autonomous systems in practical applications. Her liquid neural networks are inspired by the dynamics of biological neurons and are characterized by high generalization ability and robustness with limited amounts of data. They enable, among other things, drones to navigate in unfamiliar environments or to adapt to novel weather and lighting conditions. Her team's AI co-pilot ("Air-Guarian") monitors the pilot and intervenes in the event of potential risks. It combines human intuition with machine precision, therefore improving aviation safety.

In all her research, Daniela Rus is a pioneer in responsible AI and autonomous systems. At the same time, she has an impressive track record in the areas of innovation and technology transfer. As co-founder of the startup "Liquid AI" and leader of numerous industrial collaborations, she ensures that scientific advances in autonomous systems lead to concrete applications that are highly relevant to society: whether in mobility, healthcare, nursing, agriculture, logistics, environmental protection, or disaster management. Daniela Rus combines outstanding scientific excellence with technical innovation and social responsibility —thus perfectly embodying the spirit of the High-Tech Award of the Bavarian Minister-President, which is jointly presented by the Bavarian Academy of Sciences and Humanities and the Bavarian State Government.

Daniela Rus was born in 1963 in Cluj-Napoca, Romania, and earned her Ph.D. in computer science in 1992 from Cornell University under the supervision of Turing Award laureate John Hopcroft. From 1994 to 2003, she taught and conducted research as an assistant and associate professor at Dartmouth College, where she founded and directed the Dartmouth Robotics Laboratory. In 2004, she became Andrew and Erna Viterbi Professor of Electrical Engineering and Computer Science at the Massachusetts Institute of Technology (MIT) in Cambridge, USA. Since 2012, she has served as director of the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL), and since 2025, she has been the MIT Panasonic Professor of Computer Science. She is a co-founder of "Liquid AI," a startup focused on advancing liquid neural networks for AI and robotics; she is also a Senior Visiting Fellow at the MITRE Corporation, an independent nonprofit organization that provides technical advice to government agencies, as well as a board member or advisor to several technology companies in the fields of artificial intelligence, robotics, and logistics.

Daniela Rus has received numerous awards for her outstanding research achievements. Among other honors, she has received the IEEE Edison Medal (2025), the John Scott Medal (2024), the IEEE Robotics and Automation Award (2023), and the Engelberger Robotics Award (2017) — the highest honor in industrial robotics — as well as prestigious grants such as the MacArthur Fellowship. She is a member of the U.S. National Academy of Sciences, the National Academy of Engineering, the American Academy of Arts and Sciences, and the Bavarian AI Council, among others.