

Tenure-track professorship for Soft Machines established

Dr. Edoardo Milana has been appointed Tenure-Track-Professor for Soft Machines at the Institute of Microsystems Engineering at the University of Freiburg as of May 1, 2023. The newly established professorship focuses on the development of soft robotic systems made of deformable and adaptive materials.

Milana will strengthen the research of the Cluster of Excellence Living, Adaptive and Energy-autonomous Materials (*//iMatS*) in the field and work closely with scientists from the Freiburg Center for Interactive Materials and Bioinspired Technologies (FIT) and the Freiburg Materials Research Center (FMF).

Advantages over rigid robots

Conventional robots are made of rigid materials and require numerous motors and precise control algorithms to respond in a flexible manner. Soft robots, on the other hand, are made of materials such as gels or elastomers, and are able to harness their compliance to perform specific functions. Compared to rigid robots, they are cheaper to produce and consume fewer resources, are easier to maintain during operation, are easier to recycle, and are considered safer to interact with humans. "It is a technology that has a huge potential for applications where the operating environment of an autonomous machine or device is unpredictable and changeable, such as search and rescue in disaster areas, assistive robotics, prosthetic implants, robotic surgery or smart wearables," says Milana.

Advanced and intelligent Soft Machines

"My goal is to advance the knowledge on the mechanical design, fabrication processes and system integration of soft machines to bridge the gap between these machines and biological living systems in terms of autonomy, adaptivity and resilience. These Soft machines will intelligently interact with environments at different scales thanks to their engineered material properties. The machines obtain this so called embodied artificial intelligence through multifunctional materials and structures with distributed and redundant actuation, sensing, control and energy."

Edoardo Milana studied mechanical engineering and nanotechnology at La Sapienza University in Rome. He received his PhD from KU Leuven in 2020 with a thesis on artificial cilia for bioinspired microfluidic propulsion and distributed fluidic control of soft robots. In 2019, he was a visiting scientist at the University of Milan, followed by research at the German Aerospace Center (DLR) in Bonn. In 2022, he was selected in the Rising Stars Academy of the University of Freiburg where he cooperated for the first time with scientists of the Cluster of Excellence *//iMatS*. He moved to the Freiburg Center for Interactive Materials (FIT) and to *//iMatS* in 2023 with a grant from the Walter Benjamin Programme of the German Research Foundation (DFG).

Press release

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Further information

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