

Webinar of the IEEE TC Micro/Nano Robotics and Automation

The IEEE Technical Committee for Micro/Nano Robotics and Automation launches a series of online seminars. **One selected speaker will present cutting-edge research** in the micro/nano robotics field. Join us **Wednesday June 14th 2023, 8am UTC**, for one hour. We will welcome:

Prof. Tiantian Xu

Associate Professor, Shenzhen Institutes of Advanced Technology,
Chinese Academy of Sciences



Title: Independent and cooperative control of multiple magnetic soft-film microrobots

Abstract: Untethered, wirelessly controlled microrobots have a broad application prospects for the bioengineering due to their small scales. Multiple small-scale robots enable cooperation and increase the operating efficiency. However, independent control of multiple magnetic small-scale robots is a great challenge, because the robots receive identical control inputs from the same external magnetic field. We propose a novel strategy of completely decoupled independent control of magnetically actuated flexible swimming millirobots. The strategy is verified by experiments of independent position control of up to four millirobots and independent path following control of up to three

millirobots with small errors. Then, we propose an adaptive leader-follower formation control of two magnetically actuated millirobots with heterogeneous magnetization and achieved an autonomous navigation in confined environments.

Bio: Tiantian Xu is currently Professor in Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences. She received the M.S. degree in Industrial Engineering from the Ecole Centrale



Paris, France, in 2010, and the Ph.D. degree at the Institute of Intelligent Systems and Robotics (ISIR), University of Pierre and Marie Curie, Paris, France, in 2014. She worked for the Chinese University of Hong Kong as a postdoctoral fellow from 2014 to 2016. Her research interests are currently focused on design and control of magnetically actuated swimming microrobots. She has published over 20 IEEE Transactions papers, including TRO, T-cyber, TMECH, TASE, and etc. She has received the NSFC excellent young scholar in 2020, the best application paper award in IROS2019, and the Second Prize of Wu Wenjun Natural Science of Artificial Intelligence in 2021 as first author. She is associate editor for TRO, TASE and RAL.

Lab website: <https://peopleucas.edu.cn/~xutiantian?language=en>

Link for the connection: The **link will be announced** a few days before the event on the IEEE Technical Committee for Micro/Nano Robotics and Automation webpage:

<https://www.ieee-ras.org/micro-nano-robotics-and-automation/activities>