

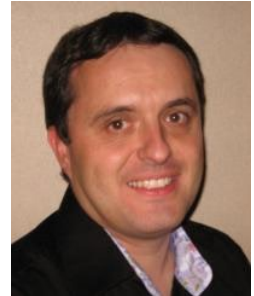
# **Improving dexterity in robotic contact and non-contact manipulation. Towards high-speed manufacturing and cell sorting.**

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## **Abstract**

In the last decades, miniaturized robotics have provided a lot of proof of concept of micromanipulation technologies using both non contact actuation and contact tweezers enabling to handle and position micro and nano-objects. However, the performances in micro-nanoscale manipulation are still far away from the large scale robotics in term of dexterity and throughput. In the presentation, we will explore the main challenges and some recent works in improving the microhandling performances. In contact manipulation, the improvement of dexterity may enable to perform in-hand repositionning of future dexterous microhands whose first proofs of concept will be introduced. In non contact manipulation, we will explore the use of electric fields to both position and measure the position of single cells (T-cells and cancer cells) for highthroughput sorting dedicated to adoptive cell therapies.



## **Bibliography**

Michaël Gauthier received the Ph.D. degree in automation and robotics from the Université de Franche Comté, Besançon, France in 2002. He is currently CNRS senior scientist with FEMTO-ST institute, works in the field of micro-nanorobotics since 2000 and has proposed, modeled and experimented new robotics tools for microhandling, micromanipulation and micro-assembly in several European and National projects. He is currently co-leader of the European Topics Group on Miniaturized robotics in the euRobotics platform and is going to take the lead of the FEMTO-ST CNRS research institute (700 persons) in january 2024. During the last years, he was the head of the micro-nanorobotics department in FEMTO-ST (2012-16), the vice-director of FEMTO-ST institute (2016-19) and the president of the French-Swiss Alliance between FEMTO-ST and EPFL, named SMYLE (2018-2023). He is the author of 2 books, more than 50 papers and 60 conference talks in miniaturized robotics. He is also the co-founder of the spin-off 'Percipio Robotics SA' providing micro-assembly platforms for industrial applications.