PHYSICAL MATH SEMINAR

Robotic tomography

MATTHIEU LABOUSSE
ESPCI

ABSTRACT:

Over the last few decades, electrical engineers, physicists and chemists have put considerable efforts into designing micro robots with the dream to revolutionize microsurgery, safety and exploration in extreme and severe conditions. As soon as it approaches the true micro-scale, these robots lose their ability to carry a camera, whether due to the intrinsic diffraction limit or the limited on-board computing power. These robots would essentially be blind and unable to access their orientation. So, it is surprising that these robots, though technologically elegant, would be of any practical use.

We found a new mathematical result that enables these robots to recognize any shape. We carried out a proof-of-concept with a toy commercial robot known for its exceptional pedagogical appeal, and showed that a robot lacking visualization or internal compass capabilities can perform autonomous pattern recognition. We also show that this new mathematical theorem enables the robot to read letters and words.

TUESDAY, SEPTEMBER 26, 2023
2:30 pm – 3:30 pm
Building 2, Room 449

https://math.mit.edu/pms/

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