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JOINT INSTITUTE 交大密西根学院

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Quantization, Calibration and Planning for Euclidean Motions in Robotic Systems

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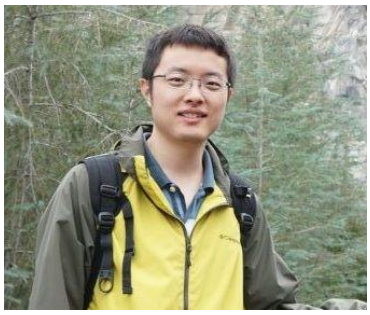

Abstract:

The properties of Euclidean motions are fundamental in all areas of robotics research. Throughout the decades, investigations on some low-level tasks like parameterizing specific movements and generating effective motion plans foster high-level operations in an autonomous robotic system. In typical applications, before executing robot motions, a proper quantization of basic motion primitives could simplify online computations; a precise calibration of sensor readings could elevate the accuracy of the system controls. Of particular importance in the whole autonomous robotic task, a safe and efficient motion planning framework would make the whole system operate in a well-organized and effective way. All these modules encourage huge amounts of efforts in tackling challenges, such as the uniformity of quantization in non-Euclidean manifolds, the calibration errors on unknown rigid transformations due to the lack of data correspondence and noise, the narrow passage and the curse of dimensionality bottlenecks in developing motion planning algorithms, etc. Therefore, the goal of this talk is three-fold: quantization, calibration and planning for Euclidean motions.

Biography:

阮思朴，博士，2015 年获哈尔滨工业大学工学学士，2015 年 9 月开始于美国约翰霍普金斯大学攻读博士学位，期间于 2017 年获硕士学位，于 2020 年 6 月完成博士课题答辩。主要研究方向包括：机器人路径规划、计算运动学、计算几何等。先后在机器人领域的期刊（如 Autonomous Robots, ASME Journal of Mechanisms and Robotics 等）以及学术会议（如 ICRA, Humanoids, WAFR 等）上发表论文 10 余篇。阮思朴是 IEEE 学会、ASME 学会会员，自 2018 年起任 Robotica 期刊主编助理。