上海交通大学自动化系
Department of Automation
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系统控制与信息处理教育部重点实验室
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Spatial Intelligence, From Localization to Manipulation

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摘要:

Spatial Intelligence aims to teach robots to learn to reason and to interact with 3D space. This talk covers our works on four different aspects of spatial intelligence, including localization, mapping, scene understanding, and navigation/manipulation. We introduce an method for dense visual SLAM with regular RGB cameras by optimizing the NeRF-based map and camera poses simultaneously. To facilitate localization on mobile systems, we introduce a map compression method that can compress the map size by 200-300 times. We also introduce a novel Gaussian Splatting method to enhance 3D mapping quality and efficiency. The reconstructed 3D map can be parsed with object detection to facilitate robot navigation. We explore scene context information for both 3D indoor scene generation and understanding. These capabilities enable robots to navigate and interact with the real physical world.

简介:

谭平教授为香港科技大学电子与计算机工程系教授。曾担任阿里巴巴达摩院XR实验室负责人，人工智能实验室计算机视觉首席科学家，加拿大西门菲莎大学（SFU）、新加坡国立大学（NUS）副教授。他的研究领域是计算机视觉和图形学。他于2012在CVPR大会上获得Young Researcher Award提名奖，2014年获得加拿大自然科学基金DAS奖。他曾担任计算机视觉领域两大期刊TPAMI、IJCV的副主编，并长期担任CVPR、ICCV、ECCV、SIGGRAPH、IROS等计算机视觉、图形学、机器人领域顶会的领域主席。