学术报告会

Embodied Visual Perception for

Autonomous Systems

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摘要：

Embodied visual perception has aroused extensive interests in computer vision and robotics recently due to the ability of acquiring generalizable and complex knowledge, while there still exists several challenges in the practical deployment: i) the limited resource of storage and computation in autonomous systems, ii) the weak ability to recognize object in fine-grained levels, iii) the complicated object relation understanding for task planning. We address these challenges to achieve precise and efficient visual perception for the deployment of embodied agents in autonomous systems. First, we quantize the deep models with low quantization errors and information redundancy, where the classification and detection performances are still comparable with significantly enhanced inference efficiency. Second, we propose the dynamic spatial resolution for small object detection in 3D environments, so that objects in different levels can be recognized for subsequent manipulation. Third, we present the interactive perception mechanism for robotic manipulation in dense clutters, which are applied in our robotic packing system for general object package.

简介：

Ziwei Wang is currently a PhD candidate in the Department of Automation, Tsinghua University, supervised by Prof. Jiwen Lu. He received the B.S. degree from the Department of Physics, Tsinghua University in 2018. His research interests include efficient deep learning and foundational models for robotics. He has published over 20 scientific papers in TPAMI, IJCV, RAL, ICRA, IROS, CVPR, ICCV and ECCV, including five papers in TPAMI. He serves as a regular reviewer member for TIP, TCSVT, CVPR, ICCV, ECCV, NeurIPS, ICML, ICLR and ICRA. He won the National Scholarship twice at Tsinghua University.