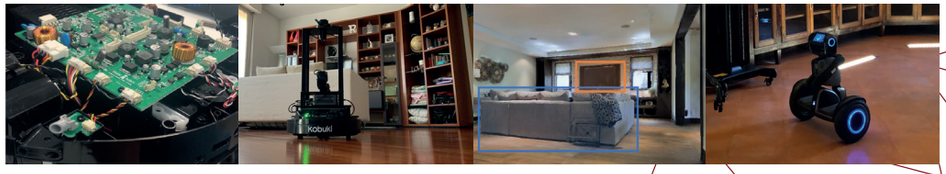
The increase in available computing power and the Deep Learning revolution have allowed the exploration of new topics and frontiers in Artificial Intelligence research. A new field called Embodied Artificial Intelligence, which places at the intersection of Computer Vision, Robotics, and Decision Making, has been gaining importance during the last few years, as it aims to foster the development of smart autonomous robots and their deployment in society. The recent availability of large collections of 3D models for photorealistic robotic simulation has allowed faster and safe training of learning-based agents for millions of frames and a careful evaluation of their behavior before deploying the models on real robotic platforms. These intelligent agents are intended to perform a certain task in a possibly unknown environment. To this end, during the training in simulation, the agents learn to perform continuous interactions with the surroundings, such as gathering information from the environment, encoding and extracting useful cues for the task, and performing actions towards the final goal; where every action of the agent influences the interactions. This dissertation follows the complete creation process of embodied agents for indoor environments, from their concept to their implementation and deployment. We aim to contribute to research in Embodied AI and autonomous agents, in order to foster future work in this field. We present a detailed analysis of the procedure behind implementing an intelligent embodied agent, comprehending a thorough description of the current state-of-the-art in literature, technical explanations of the proposed methods, and accurate experimental studies on relevant robotic tasks.



Autonomous Embodied Agents: When Robotics Meets Deep Learning Reasoning

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