

Abstract

An Object Prediction in Robotics with Quantum Artificial Intelligence on Nano Computing

Quantum computing can work as an alternative for almost every search algorithm used in robotics and AI applications and reduce complexity.

The modern robots need fast computer vision capabilities in order to perceive and assess their environment. Hence, the hopes lie with the quantum efficiency to better understand the nature of visual information, and to secure, store and process them efficiently with the help of quantum properties – entanglement and parallelism with quantum image processing.

The basic idea is that properties of an image, like the colors at certain positions, can be encoded as qubit-lattices, which was widely accepted and formally extended by many representations and possible applications, including videos.

As visualized into quantum image representations, transformations, applications, and algorithms are required for robotic perception. However, this approach only deals with two-dimensional images, which is not sufficient when dealing with robotic perception, where the input of multiple sensors is often fused into a three-dimensional point cloud, in order to locate and identify objects and environments.

As suggested by the abstract, currently, only a few methods exist to express a three-dimensional image by quantum representation in the form of the quantum point cloud. As with other quantum technologies, the general expectation is that QIMP will surpass the capabilities and performance of its traditional equivalents by far in this research.

QIMP- Quantum Image Processing

QIRs- Quantum Image Representations