

How Can Machine Learning Help Computer Vision in the Next Decade?

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Abstract

Deep learning has made an enormous impact on computer vision in the last decade. What ML technologies lie ahead of us that may have an impact on the future of computer vision? I will discuss two such general technologies: equivariance and quantum statistics. Equivariance plays an important role in making our models of images independent of some arbitrary choices that we are forced to make in a computer implementation, such as the choice of the pixel grid. Farther away in the future I also predict that quantum computation could play an important role in processing of image and video data. I will try to introduce quantum mechanics at a very simple level and hope to make a convincing argument why optical quantum computers are in fact a very natural match for computer vision problems.