Proposal of Channel Attention for Quantum Convolutional Neural Networks

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Quantum Convolutional Neural Networks (QCNNs) have emerged in recent years, demonstrating success, especially in the domain of quantum phase recognition problems. However, the practical application of QCNNs to real-world problem-solving demands further cost reduction and improvement in performance. To address these challenges, this study introduces a novel solution through the introduction of a channel attention mechanism designed specifically for QCNNs. Drawing inspiration from its classical counterpart, our proposed attention mechanism generates multiple output channels based on the measurement of quantum bits. This approach not only enhances the performance of QCNNs beyond conventional methods but also addresses the need for cost reduction in model implementation.

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