



**THE ISSUE CONTAINS:**

Proceedings of the 7th  
International Scientific  
and Practical Conference

**RECENT SCIENTIFIC  
INVESTIGATION**

Oslo, Norway  
26-28.02.2024

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**INTERCONF**

**No 190**  
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# No 190

February, 2024

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OSLO  
2024

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## INFORMATION AND WEB TECHNOLOGIES

# CNN training programs based on quantum computing

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Quantum algorithms can provide faster solutions to certain classes of optimization problems compared to classical algorithms. This is especially true for problems with a large number of variables or constraints. Quantum computers can perform operations on multiple versions of data at once thanks to the principle of quantum parallelism, which can lead to more efficient processing of optimization problems. The program opens up the possibility of research and development of new quantum algorithms and approaches to solving optimization problems, which can lead to the creation of more effective optimization methods in future.

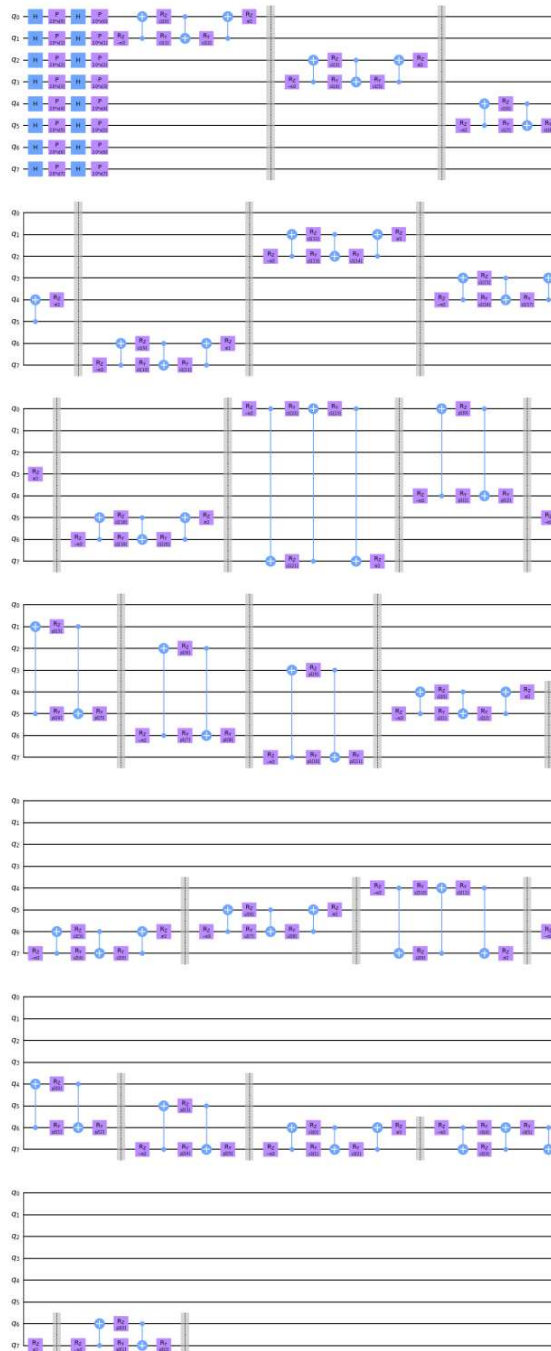
Quantum computing-based Convolutional Neural Network (CNN) training provides a powerful tool for image analysis and computer vision problem solving using quantum mechanical principles. Its functionality may include:

**CNN model initialization:** Create a convolutional neural network with a given architecture, including convolution, pooling, and fully connected layers, and selecting activation functions.

**Image Loading and Preprocessing:** Ability to load and preprocess images for use in neural network training, including data resizing, normalization, and data augmentation.



## INFORMATION AND WEB TECHNOLOGIES



Optimizer and Loss Function Selection: Provides a choice of different optimizers (e.g., Adam, RMSprop) and loss functions (e.g., categorical cross entropy, root mean squared