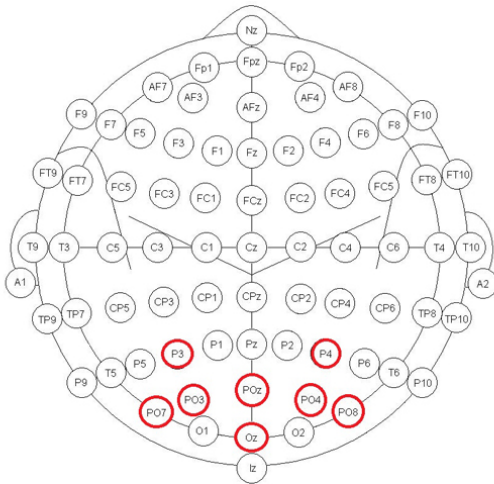


Convolutional Neural Networks and Genetic Algorithm for Visual Imagery Classification

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Brain-Computer Interface (BCI) systems establish a channel for direct communication between the brain and the outside world without having to use the peripheral nervous system. While most BCI systems use evoked potentials and motor imagery, in the present work we present a technique that employs visual imagery. Our technique uses neural networks to classify the signals produced in visual imagery. To this end, we have used densely connected neural and convolutional networks, together with a genetic algorithm to find the best parameters for these networks. The results we obtained are a 60% success rate in the

classification of four imagined objects (a tree, a dog, an airplane and a house) plus a state of relaxation, thus outperforming the state of the art in visual imagery classification.