

## Particle Swarm Optimization and Quantum Particle Swarm Optimization to Multidimensional Function Approximation

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**Abstract :** This work compares the results of multidimensional function approximation using two algorithms: the classical Particle Swarm Optimization (PSO) and the Quantum Particle Swarm Optimization (QPSO). These algorithms were both tested on three functions - The Rosenbrock, the Rastrigin, and the sphere functions - with different characteristics by increasing their number of dimensions. As a result, this study shows that the higher the function space, i.e. the larger the function dimension, the more evident the advantages of using the QPSO method compared to the PSO method in terms of performance and number of necessary iterations to reach the stop criterion.

**Keywords :** PSO, QPSO, function approximation, AI, optimization, multidimensional functions

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