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| n-D | | | | |
| Function | LB | UB | Ideal F | Ref |
| Sphere | -100/-10/-5.12 | 100/10/5.12 | 0 | [1][2]***[3]***[4][5][9][10][16][18][19][21][27][28][29]  [30][6][7][8][11][12][13][14][15][17][20][22][23][24][25][31] |
| Schwefel P2.22 | -10 | 10 | 0 | [1][9][10][18][19][21][28] [29][30][6][7][8][11][12][13][14][15][17][20][22][23][24][25][31] |
| Quadric | -100 | 100 | 0 | [1] |
| Rosenbrock | -10/-30/-2.048/-5 | 10/30/2.048/10 | 0 | [1][2][4][5][9][10][16][18][19][21][27][28][29][30][6][7][8][12][14][17][20][22][23][24][25][31] |
| Step | -100, -10 | 100, 10 | 0 | [1][9][10][19][21][27][28][29][6][7][8][12][14][17][20][22][23][24][25] |
| Quadric Noise | -1.28 | 1.28 | 0 | [1][9][10][18][19][21][27][28][29][6][7][8][12][13][14][17][20][22][23][24][25][31] |
| Schwefel P2.26 | -500/-65.536 | 500/65.536 | -418.9829\*D | [1][4][5][10][19][21][28][6][7][8][6][12][13][14][17][20][22][23][24][25] |
| Rastrigin | -5.12 | 5.12 | 0 | [1][2][4][5][9][10][16][18][19][21][27][28][29][30][6][7][31]  [8][11][12][13][14][15][17][20][22][23][24][25] |
| Noncontinuous Rastrigin | -5.12 | 5.12 | 0 | [1] |
| Ackley | -32/-30/-50/-32.768 | 32/30/50/32.768 | 0 | [1][2][3][4][5][9][10][16][18][19][21][27][28][29][6][7][23][24]  [8][11][12][13][14][17][20][22][25][31] |
| Griewank | -600 | 600 | 0 | [1][2][3][4][5][9][10][16][18][19][21][27][28][29][30][6][7][8][12][13][14][17][20][22][23][24][25][31] |
| Generalized Penalized 1 | -50 | 50 | 0 | [1][5][9][19][21][27][28][29][6][7][8][12][13][14][17][22][23][24][25][31] |
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| Michalewicz | 0/-100 | PI/100 | -0.966D | [4][28][6][17] |
| Quartic | -1.28 | 1.28 | ? | [5][12] |
| Generalized Penalized 2 | -500/-50 | 500/50 | 0 | [5][19][21][28][29][6][7][8][11][12][13][14][17][22][23][24][25][31] |
| Fletcher | -PI | PI | ? | [5] |
| Schwefel P1.2 | -100/-10 | 100/10 | 0 | [9][10][19][21][28][30] |
| Schwefel P2.21 | -100/-10 | 100/10 | 0 | [9][10][19][21][27][28][29][6][7][8][12][13][14][17][20][22][23][24][25][31] |
| Alpine | -10/-100 | 10/100 | 0 | [9][10][28][30][12][15][31] |
| Zakharov | -5 | 10 | 0 | [9][29][24] |
| Cigar | -100/-10 | 100/10 | 0 | [10][28][29][24] |
| Levy | -10 | 10 | 0 | [10] |
| Schwefel | -100 | 100 | 0 | [16] |
| Sum Square | -10 | 10 | 0 | [18][28][30][12] |
| Sum Power | -1 | 1 | ? | [18] |
| Exponential | -10 | 10 | ? | [18] |
| Leon | -1.2 | 1.2 | 0 | [28] |
| Zettl | -5 | 5 | -0.00379 | [28] |
| Schwefel P1.12 | -100 | 100 | 0 | [29][6][7][8][11][12][13][14][17][20][22][23][24][25][31] |
| Powell | -4 | 5 | 0 | [29] |
| Tablet | -1 | 1 | 0 | [29] |
| Elliptic | -100 | 100 | 0 | [29][12] |
| Brown | -1 | 4 | 0 | [29] |
| Chung Reynolds | -100 | 100 | 0 | [29] |
| Powell sum | -1 | 1 | 0 | [29] |
| Csendes | -1 | 1 | 0 | [29] |
| Inverted Cosine Mixture | -1 | 1 | 0 | [29][12] |
| Salomon | -100 | 100 | 0 | [29][12] |
| Xin\_She\_Yang3 | -20/-100 | 20/100 | -1 | [6][17] |
| Xin\_She\_Yang4 | -20/-5 | 20/5 | -1 | [6][17] |
| Sum\_of\_different\_power | -1, -100 | 1, 100 | 0 | [12][24] |
| Schaffe6 | -100 | 100 | -1 | [12][31] |
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| 2-D | | | | |
| Function | LB | UB | Ideal F | Ref |
| Shekel’s Foxholes | -65 | 65 | 1 | [9][19][21][28] |
| Rastrigin | -5 | 5 | 0.398 | [9] |
| GoldStein Price | -5/-2 | 5/2 | 3 | [9][19][21][28][29][6][7][8][12][13][14][22][23][24] |
| Drop wave | -5.12 | 5.12 | -1 | [9][29][15][31] |
| Schaffer | -100 | 100 | -1/0 | [9] [10] |
| Easom | -100 | 100 | -1 | [9][10][28] |
| Beale | -4.5 | 4.5 | 0 | [10][28] |
| Bohachevsky 1 | -100 | 100 | 0 | [10][29] |
| Bohachevsky 2 | -100 | 100 | 0 | [10][29] |
| Bohachevsky 3 | -50 | 50 | 0 | [10][29] |
| Shubert | -10 | 10 | -186.73 | [10][29] |
| Six-Hump Camel-Back | -5 | 5 | -1.0316 | [21][28][6][7][8][12][14][22][23][25] |
| Branin | -5 | 5 | 0.398 | [21][28][6][7][8][12][14][22][23][24] |
| Matyas | -10 | 10 | 0 | [28][29] |
| Booth | -10 | 10 | 0 | [28] |
| Leon | -1.2 | 1.2 | 0 | [29] |
| Bartels Conn | -500 | 500 | 1 | [29] |
| Bird | -2PI | 2PI | -106.764 | [29] |
| Schf6 | -100 | 100 | 0 | [2] |
| De\_Jong5 | -65/-65.536 | 65/65.536 | 1 | [6][7][8][12][13][14][20][22][23][24][25] |

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| 3-D | | | | |
| Function | LB | UB | Ideal F | Ref |
| Hartman 3 | 1 | 3 | -3.86 | [19][21][28][29][6][7][8][12][14][22][23][24][25] |
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| 4-D | | | | |
| Function | LB | UB | Ideal F | Ref |
| Kawalik | -5 | 5 | 0.0003075 | [9][19][21][28][29][6][7][8][12][13][14][22][23][24][25][31] |
| Shekel 5 | 0 | 10 | -10.1532 | [9][21][28][6][7][8][12][13][14][22][23][24][25][31] |
| Shekel 7 | 0 | 10 | -10.4029 | [9][28][6][7][8][12][13][14][22][23][24][31] |
| Shekel 10 | 0 | 10 | -10.5364 | [9][28][6][7][8][12][13][14][22][23][24][31] |
| Colville | -10 | 10 | 0 | [29] |
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| 6-D | | | | |
| Function | LB | UB | Ideal F | Ref |
| Hartman 6 | 0 | 1 | -3.32 | [19][28][6][7][8][12][14][22][23][24][25] |
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| 10-D | | | | |
| Function | LB | UB | Ideal F | Ref |
| Michalewitz | -100 | 100 | 0.966D | [10] |
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[1] Adaptive Particle Swarm Optimization

[2] A novel bee swarm optimization algorithm for numerical function optimization

[3] Chaos-enhanced accelerated particle swarm optimization

[4] Experimental Analysis of Bound Handling Techniques in Particle Swarm Optimization

[5] Biogeography-based optimisation with chaos

[6] Grey Wolf Optimizer

[7] The Whale Optimization Algorithm

[8] Hybrid Algorithm of Particle Swarm Optimization and Grey Wolf Optimizer for Improving Convergence Performance

[9] Lévy Flight Trajectory-Based Whale Optimization Algorithm for Global Optimization

[10] Chaotic whale optimization algorithm

[11] 一种改进的鲸鱼优化算法

[12] A hyper-heuristic for improving the initial population of whale optimization algorithm(還沒)

[13] An efficient double adaptive random spare reinforced whale optimization algorithm

[14] An enhanced associative learning-based exploratory whale optimizer for global optimization

[15] An Enhanced Whale Optimization Algorithm with Simplex Method

[16] Chaotic particle swarm optimization with sigmoid-based acceleration coefficients for numerical function optimization

[17] New binary whale optimization algorithm for discrete optimization problems

[18] 改进的鲸鱼优化算法及其应用

[19] 基于自适应权重和模拟退火的鲸鱼优化算法

[20] 基于改进型鲸鱼优化算法和最小二乘支持向量机的炼钢终点预测模型研究

[21] 精英反向黄金正弦鲸鱼算法及其工程优化研究

[22] Enhanced whale optimization algorithm for maximum power point tracking of variable-speed wind generators

[23] Improved Whale Optimization Algorithm applied to design PID plus second-order derivative controller for automatic voltage regulator system

[24] Improved Whale Optimization Algorithm Based on Nonlinear Adaptive Weight and Golden Sine Operator

[25] Multi-Strategy Ensemble Whale Optimization Algorithm and Its Application to Analog Circuits Intelligent Fault Diagnosis

[26] Opposition based competitive grey wolf optimizer for EMG feature selection

[27] 一种离散鲸鱼算法及其应用

[28] I‑GWO and Ex‑GWO: improved algorithms of the Grey Wolf Optimizer to solve global optimization problems

[29] A novel enhanced whale optimization algorithm for global optimization

[30] Improved Whale Optimization Algorithm for Solving Constrained Optimization Problems

[31] Nature-inspired approach: An enhanced whale optimization algorithm for global optimization