Rastrigin function

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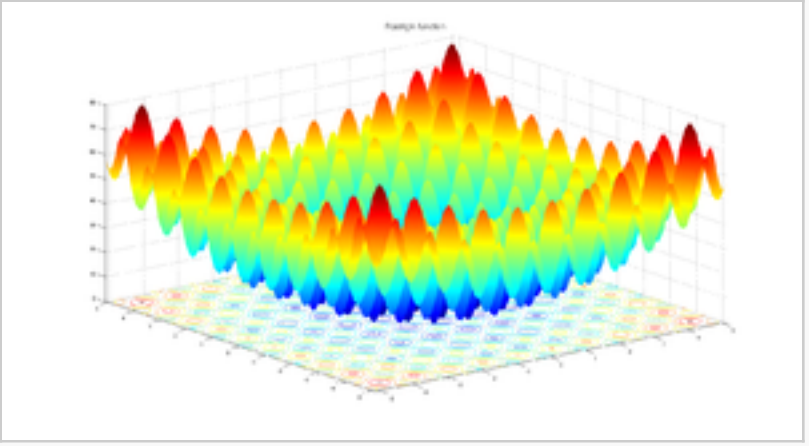
In mathematical optimization, the **Rastrigin function** is a non-convex function used as a performance test problem for optimization algorithms. It is a typical example of non-linear multimodal function. It was first proposed by Rastrigin [1] as a 2-dimensional function and has been generalized by Mühlenbein et al.[2] This function is a fairly difficult problem due to its large search space and its large number of local minima.

It is defined by:

Rastrigin function of two variables



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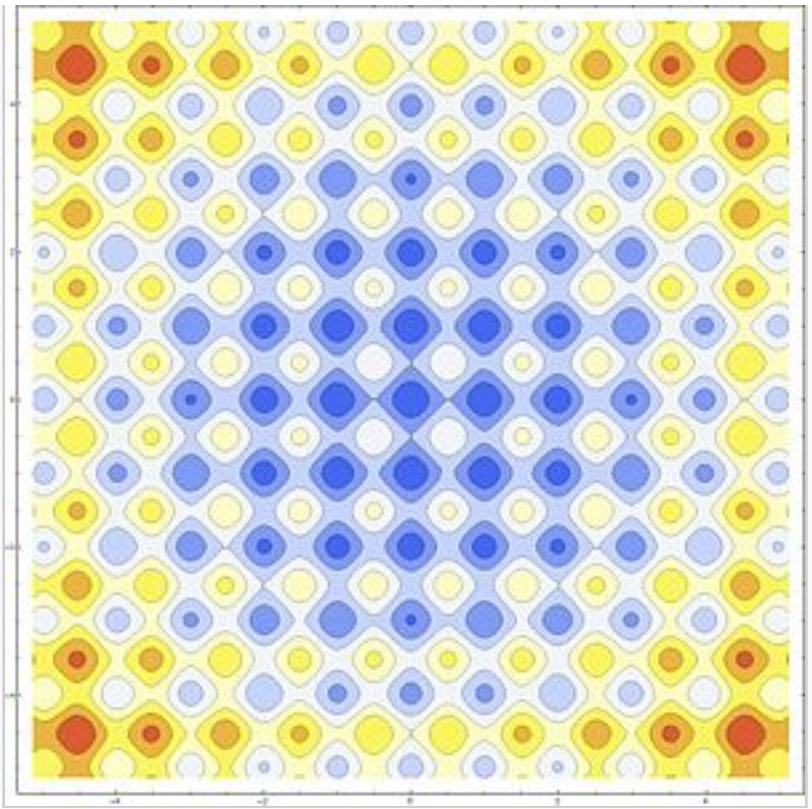

Contour

$$f(\mathbf{x}) = An + \sum_{i=1}^{n} \left[x_i^2 - A\cos(2\pi x_i) \right]$$

where $A = 10$ and $x_i \in [-5.12, 5.12]$. It has a global minimum at $\mathbf{x} = \mathbf{0}$ where $f(\mathbf{x}) = 0$.

See also [edit]

- Test functions for optimization

Notes [edit]

1. ^ A. Törn and A. Zilinskas. "Global Optimization". Lecture Notes in Computer Science, Nº 350, Springer-Verlag, Berlin, 1989.

2. ^ H. Mühlenbein, D. Schomisch and J. Born. "The Parallel Genetic Algorithm as Function Optimizer ". Parallel Computing, 17, pages 619–632, 1991.

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