Lab 3 Exercise - Optimise it!

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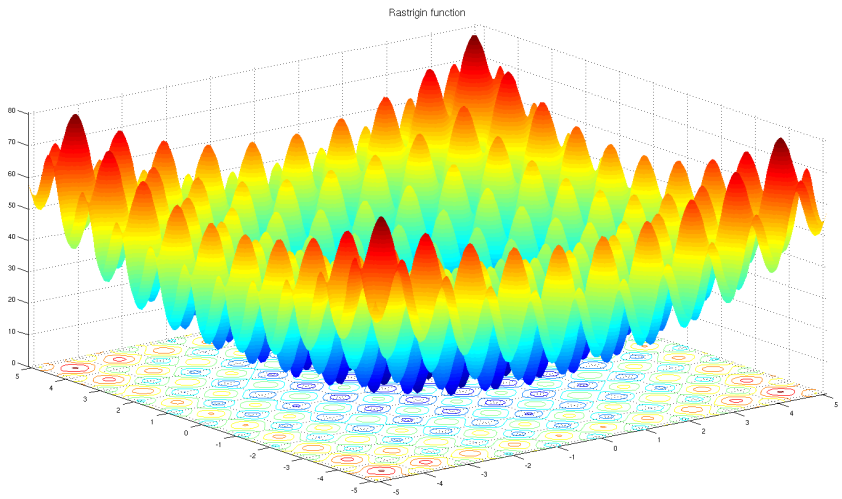
This is the exercise that you need to work through **on your own** after completing the third lab session. You'll need to write up your results/answers/findings and submit this to ECS handin as a PDF document along with the other lab exercises near the end of the module (1 pdf document per lab).

We expect that you should aim to use one side of A4 to cover your responses to *this* exercise. This exercise is worth 5% of your overall module grade.

1 Exploring optimisation of analytic functions

The Rastrigin Function is a fun optimisation challenge with many local minima and a single global minima:



1.1 Rastrigin (3 marks)

Consider the 2D Rastrigin function (`https://en.wikipedia.org/wiki/Rastrigin\_function`). Starting at $[5, 5]$ compute the point where the following optimisers arrive to after 1000 epochs:

- SGD (lr=0.01)
- SGD+Momentum (lr=0.01, momentum=0.9)
- Adagrad (lr=0.01)
- Adam (lr=0.001)

Create a loss plot showing the function value at each epoch for each of the different optimisers. Use the PyTorch implementations of the optimisers with the default values for unspecified parameters.