# Neural Networks Hello World + Assignments 2, 3

## (Neural Networks Implementation and Application Tutorial)

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# Overview

- Assignment 2
- Gradient
- PyTorch's Autograd
- NN Hello World
- Assignment 3

# Assignment 2

TODO

# Optimization

## Gradient 🤔

- What is it?
- How do we denote it?
  - $\nabla f(p) = [\frac{\delta f}{\delta x_1}(p), \ldots, \frac{\delta f}{\delta x_k}(p)]$
- Why is it important?
  - Optimalization

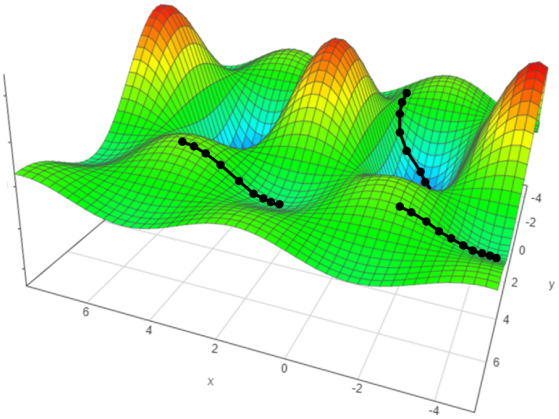


Figure 1: Function parameter landscape from [1]

# Optimization

## Few questions 🧐

- How does step/gradient-based optimization work?
- How is the step size determined?
- Why do we subtract the gradient and not add it?
- If we start in different places will we always find the same spot?
- Will we always find the global minimum?

Figure 2: Function parameter landscape from [2]

# Autograd & PyTorch

TODO

# Assignment 3

- Any questions?

# Resources


- [1] Optimization & landscapes offconvex.org/2018/11/07/optimization-beyond-landscape/
- [2] Optimization Introduction by Scipy scipy-lectures.org/advanced/mathematical_optimization/