#### **Effective Programming Practices for Economists**

# **Numerical Optimization**

#### Visualizing optimizer histories

Janoś Gabler and Hans-Martin von Gaudecker

# Steps for choosing an algorithm

- 1. Theory (algorithms video)
- 2. Experimentation (here)
- 3. Refine until convergence

### Motivation

- You rarely have a guarantee that an optimizer will work
  - Assumptions of convergence proofs might not hold in practice
  - You might get stuck in local optima
  - Floating point calculations are never exact
- But you can compare the performance of optimizers
  - Which one finds the lowest/highest function value?
  - Which one leads to the quickest decrease/increase in function values?
- The criterion\_plot makes this very easy!

## **Criterion plot**

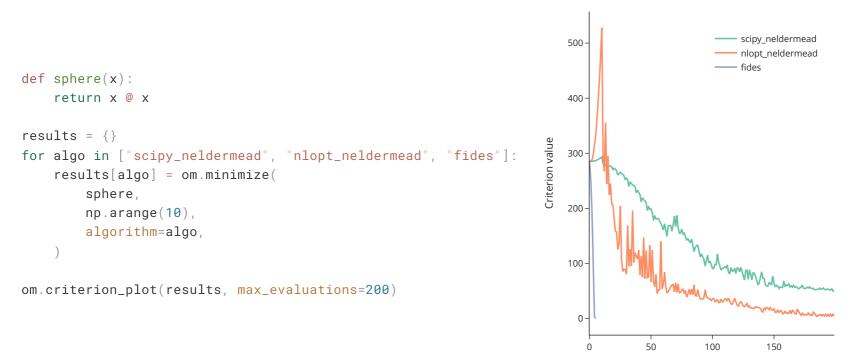
We assume you have done an optimization and the result is called res

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# **Criterion plot for multiple optimizations**



No. of criterion evaluations