



Politechnika Wrocławska

Optimization method packages





Remarks

- Logotypes have built-in hyperlinks
- The optimization tasks provided serve as illustrative examples to demonstrate the functionality of the package. However, these packages have wider applications.



SciPy



SciPy library tutorials

<http://scipy-lectures.org/>

<https://docs.scipy.org/doc/scipy/reference/tutorial/optimize.html>

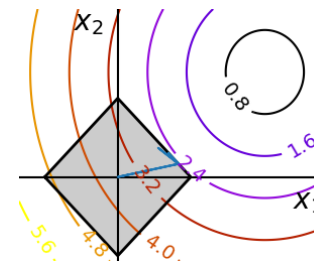
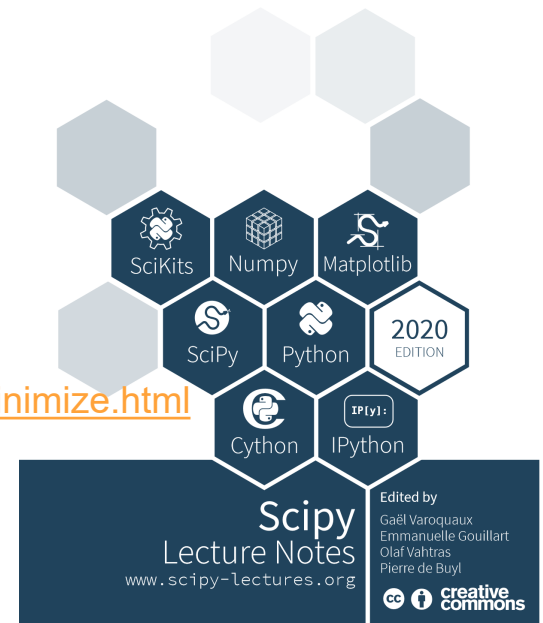
Continuous nonlinear optimization

<https://docs.scipy.org/doc/scipy/reference/generated/scipy.optimize.minimize.html>

Continuous nonlinear optimization with constraints

https://docs.scipy.org/doc/scipy/reference/generated/scipy.optimize.fmin_cobyla.htm
[l#scipy.optimize.fmin_cobyla](#)

*It's best to start with this library;
if it doesn't have what we need, we'll look elsewhere.*





Cnvex programming

C V X O P T

PYTHON SOFTWARE FOR CONVEX OPTIMIZATION

Linear programming

<https://docs.scipy.org/doc/scipy-0.18.1/reference/generated/scipy.optimize.linprog.html>

Integer programming

mip 1.13.0

`pip install mip` 

Python-MIP is a modelling tool developed to provide:

- Ease of use
- High performance
- Extensibility

Discrete optimization

PuLP 2.3.1

`pip install PuLP` 

<https://coin-or.github.io/pulp/>



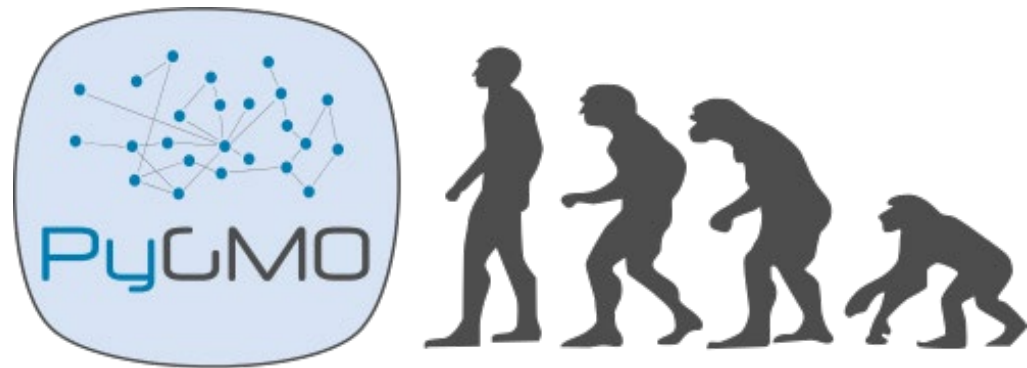
Integer programming

Package for convex and integer programming

CVXPY

<https://towardsdatascience.com/integer-programming-in-python-1cbdfa240df2>

Multicriteria optimization



Platypus - Multiobjective Optimization in Python



<https://arxiv.org/pdf/2002.04504.pdf>



Multistage optimization

Dynamic programming

<https://pypi.org/project/dy/#description>

Markov Decision Process (MDP) Toolbox for Python



Quantitative Economics with Python

Thomas J. Sargent John Stachurski



Random search methods

Nature-inspired methods



Stochastic programming



Swarm optimization



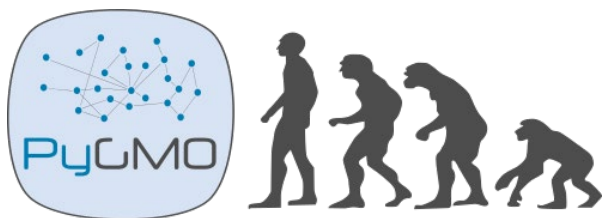


Random search methods

Nature-inspired methods



Algorytmy ewolucyjne



Algorytm genetyczny

<https://pypi.org/project/geneticalgorithm/>

Symulowane wyżarzanie

<https://pypi.org/project/simanneal/>



DISTRIBUTED
EVOLUTIONARY
ALGORITHMS IN
PYTHON

DEAP

Algorytm mrówkowy

<https://pypi.org/project/ACO-Pants/>

Algorytm pszczele

<https://pypi.org/project/honeybee/>



Optimization tools for industry.



GUROBI
OPTIMIZATION

<https://medium.com/opex-analytics/optimization-modeling-in-python-pulp-gurobi-and-cplex-83a62129807a>



https://www.ibm.com/support/knowledgecenter/SSSA5P_12.8.0/ilog.odms.cplex.help/CPLEX/GettingStarted/topics/set_up/Python_setup.html

Linear, nonlinear, integer, quadratic programming



A tool from outside Python's ecosystem, but it's worth being familiar with.