

RNBI_wrapper

最优化

多目标优化

最优化

Mosek

Python

原论文：

Shao L, Ehrgott M. Discrete representation of non-dominated sets in multi-objective linear programming ☆[J]. European Journal of Operational Research, 2016, 255(3):687-698.

目前本代码仅支持：

- 目标空间：二维或三维
- 变量空间至目标空间的映射关系：线性
- 约束条件：线性项及二次项

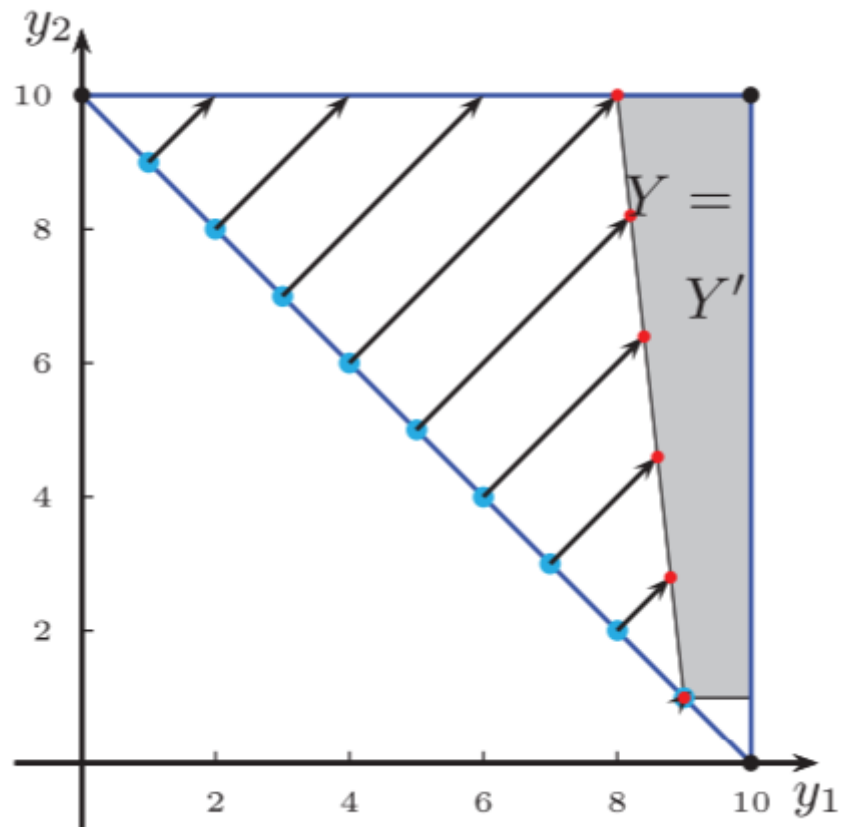
例子：

Multi-objective Linear Programming

$$\min\{Cx : Ax \geq b, x \in \mathbb{R}^n\}$$

with

$$C = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}, A = \begin{pmatrix} -1 & 0 \\ 0 & -1 \\ M & 1 \\ 0 & 1 \end{pmatrix}, b = \begin{pmatrix} -M-1 \\ -M-1 \\ M^2-1 \\ 1 \end{pmatrix}, M \geq 1.$$



程序编写:

```
import matplotlib.pyplot as plt
from mpl_toolkits.mplot3d import Axes3D
# A randomly select M>0
M = 9
params = {
    # "map matrix from variable space to objective space"
    "Y" : [[1, 0], [0, 1]],
    # "min y1"
    # "min y2"
    "direction": [1, 1],
    # "feasible region define"
    "A_con" : [[-1, 0], [0, -1], [M, 1], [0, 1]],
    "Q_con" : None,
    "blc" : [-M-1, -M-1, M*M+1, 1],
    "buc" : [mosek_g.INF, mosek_g.INF, mosek_g.INF, mosek_g.INF],
    "blx" : [-mosek_g.INF, -mosek_g.INF],
    "bux" : [mosek_g.INF, mosek_g.INF],
    "step_size": 0.5,
    # "projection_points": 50,
}
ax = plt.subplot(111)
# "RNBI_linear for linear constraints"
# "RNBI_quadratic for quadratic constraints"
rnbi = RNBI_linear(params)
result = rnbi.solve()
rnbi.visual(ax)
```

```
plt.show()
```