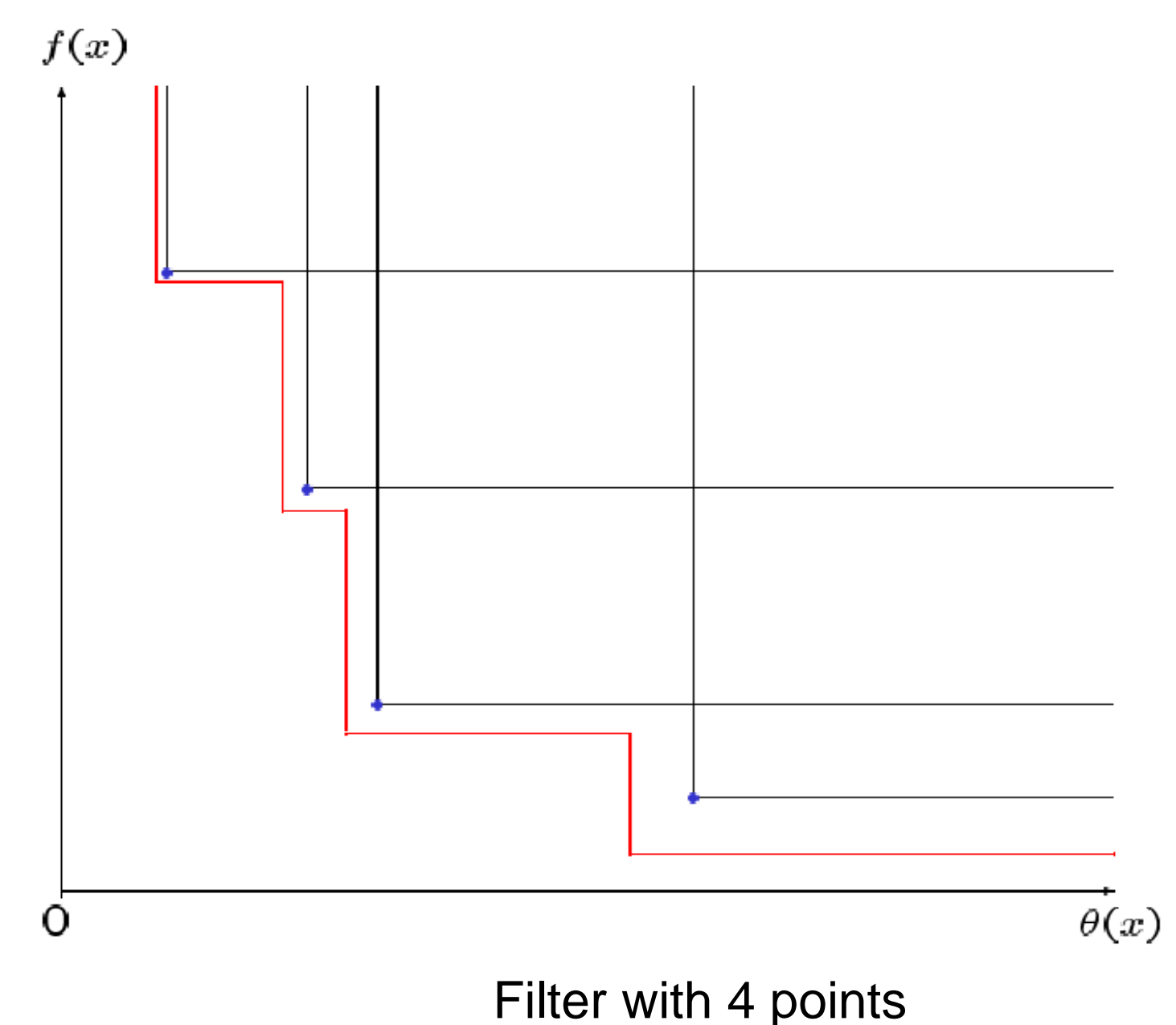




Continuous Nonlinear Optimization (CNO)

Important challenges persist:

- **Convergence control by innovative filter methods**
- **Global convergence studies**
- **Extension of interior point method to large-scale problems – new approach to linear algebra**
- **Inexact restoration approach using sequential quadratic programming**
- **Optimization problem design - Wastewater Treatment Plant**



Research Team

E.M.G.P. Fernandes (U Minho)

M.T.T. Monteiro (U Minho)

I.A.C.P. Espírito-Santo (U Minho)

C.E.P. Silva (researcher, Polytechnic Institute of Porto)

F. Fernandes (PhD student, Polytechnic Institute of Bragança)

Publications

- Costa, M.F.P.; Fernandes, E.M.G.P., A primal-dual interior-point algorithm for nonlinear least squares constrained problems, **TOP**, Vol. 13, Nº 1 (145-166), 2005.
- Espírito-Santo, I.A.C.P.; Fernandes, E.M.G.P.; Araújo, M.M.; Ferreira, E.C., NEOS Server usage in wastewater treatment cost minimization, **Lecture Notes in Computer Science**, Vol. 3483 (632-641), Springer-Verlag 2005.
- Costa, M.F.P.; Fernandes, E.M.G.P., Monotone and nonmonotone implementations of an interior point SQP filter line search algorithm, **WSEAS Transactions on Information Science and Applications**, Issue 12, Vol. 3 (2315-2322), 2006.
- Espírito-Santo, I.A.C.P.; Fernandes, E.M.G.P.; Araújo, M.M.; Ferreira, E.C., How wastewater processes can be optimized using LOQO, **Lecture Notes in Economics and Mathematical Systems**, Vol. 563 (435-455), Springer-Verlag 2006.
- Costa, M.F.P.; Fernandes, E.M.G.P., An interior point filter line search method: main convergence results. **Numerical Analysis and Applied Mathematics**, AIP Conference Proceedings 936, ISBN: 978-0-7354-0447-2, 132-135, 2007.
- Costa, M.F.P.; Fernandes, E.M.G.P., forthcoming. Practical implementation of an interior point nonmonotone line search filter method, **International Journal of Computer Mathematics**, 2007.
- Silva, C.E.P.; Monteiro, M.T.T., forthcoming. A Filter algorithm - comparison with NLP solvers, **International Journal of Computer Mathematics**, 2007.
- Silva, C.E.P.; Monteiro, M.T.T., forthcoming. A Filter Inexact-Restoration Method for Nonlinear Programming, **TOP**, 2007.

PhD and MSc Theses

- Silva, C.E.P., Um algoritmo de filtros em optimização não linear: a admissibilidade independente da optimização, MSc thesis, Universidade do Minho, 2006, supervisor: Monteiro, M.T.T.
- Fernandes, F., Método de pontos interiores com procura unidimensional baseada na técnica dos filtros para programação não linear inteira mista, PhD thesis, Universidade do Minho, supervisors: Costa, M.F.P.; Fernandes, E.M.G.P. (ongoing).

