Projects για το μάθημα της Βελτιστοποίησης

13 Ιανουαρίου, 2004

Θέματα

1. Pattern Search techniques for bound constrained optimization (Tenentes Basilis, Kalogirou Xaris)
   - *http://epubs.siam.org/sam-bin/dbq/article/30050*
   - *http://www.cs.wm.edu/~va/research/*
   - *http://en.afit.edu/ENC/Faculty/MAbramson/NOMADm.html*

2. General[1] Quadratic programming with box constraints(Rigas, Fotiou)

$$\begin{array}{l} \min\limits_x \left(x^T Q x + x^T c\right) \\ \text{subject to } \ l \leq x \leq u, \ \ \text{Q indefinite} \end{array}$$

   - *http://www.mat.univie.ac.at/ neum/software/minq/*
   - *http://www.numerical.rl.ac.uk/qp/qp.html*

3. Large Scale Convex Quadratic programming (Markouzis, Karamitsios)

$$\begin{array}{l} \min\limits_x \left(x^T Q x + x^T c\right) \\ \text{subject to } Ax = b, \ l \leq x \leq u, \ \ \text{Q positive definite} \end{array}$$

   - *http://www.numerical.rl.ac.uk/qp/qp.html*
   - Εφαρμογή σε προβλήματα Support Vector Machines (Το πρόβλημα ανάγεται σε convex quadratic)

4. Newton's method for large bound-constrained optimization problems, J. More
   - *http://www.mcs.anl.gov/~more/papers/tron.ps.gz*

5. General-linearly constrained optimization (Stefanidis, Zeliou)
   - Rosen's Gradient projection
   - Wolfe's reduced gradient
   - Constraints of the form $Ax \geq c$
   - *Nonlinear Programming –Theory and Applications*, Bazaraa, Sherali, Shetty
   - *Linear and Nonlinear Programming*, Luenberg

6. On a bound constrained optimization technique using second order information
   - *http://www.mathematik.tu-darmstadt.de/ags/ag8/Ehemalige/felkel/docs/pl2.ps.gz*

7. The Lanczos method for orthonormal basis computation.
   - Direct computation of a quadratic minimizer
   - Find conjugate directions when $Ax = b$ has indefinite A and use them to approximate a critical point
   - *Trust-Region Methods*, Conn, Gould, Toint, (Chapter 5. Krylov Subspace Methods)

[1] 'Οχι απαραίτητα convex

8. Trust region using $||\cdot||_1$ and $||\cdot||_\infty$ (Tziovara, Augoustatou)

    - Υλοποίηση της τεχνικής dog-leg που περιγράφεται σε πολλά βιβλία βελτιστοποίησης για το πρόβλημα της $||\cdot||_2$
    - *Trust-Region Methods*, Conn, Toint, Gould
    - *Numerical Optimization*, Nocedal

9. Truncated Newton methods (Papadopoulos, Poursalidis)

    - Newton like technique for large scale problems
    - *Linear and Nonlinear Programming* S. G. Nash, A. Sofer Mc Graw Hill
    - *Numerical Optimization* J. Nocedal, S. J. Wright Springer Series in Operation Research
    - *A Survey of Truncated-Newton Methods* S. G. Nash Journal of Computational and Applied Mathematics, 124 (2000), pp. 45-59
    - *TNPACK – A truncated Newton minimization package for large-scale problems: I. Algorithm and usage*
    - *Truncated Newton algorithms for large scale unconstrained optimization* R. S. Dembo, T. Steihaug Mathematical Programming
    - *Preconditioning of Truncated Newton methods* S. G. Nash SIAM Journal

10. Global optimization using Branch and Bound Techniques

    - Interval methods or stochastic methods
    - *http://solon.cma.univie.ac.at/˜neum/glopt/techniques.html*
    - *http://www.cs.sandia.gov/opt/survey/*
    - *http://archimedes.scs.uiuc.edu/baron/baron.html*
    - *Global optimization using interval analysis*, Hansen

11. Global optimization using Simulated Annealing (Tsapanos Nikolaos,)