UNIVERSITY OF MANITOBA

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

24.767 OPTIMIZATION METHODS FOR COMPUTER-AIDED DESIGN

ASSIGNMENT 3

Due Date: March 1, 2005 **Instructor: J. LoVetri**

General Instructions: This assignment is to be written up neatly since messy work will not be marked. All programs which are written for the assignment are to be fully commented and included in an Appendix at the end of the assignment. Relevant program output used to answer a question is to be transferred into tables which should be included in the main body of the report at the location where each table is being referred to.

1) Do problem 8.11 from our textbook [1].

2) Do problem 8.18 from our textbook. (You don't have to use MATLAB if you're not comfortable with it. Use whatever programming language you like.)

3) Do problem 8.19 from our textbook. (Use the program you wrote in problem 2 above for this.) Also, write programs for the *simplex* and the *Hooke-Jeeves* techniques as well as *Powell's Conjugate Direction* method, run them on Rosenbrock's function, and compare to the steepest descent algorithm you just wrote. Comment on these four algorithms. (For the *simplex* method, you can use the routine called *amoeba*() given in Numerical Recipes; do not use Powell's method from Numerical Recipes unless you are willing to describe in detail the modifications made by the authors.)

4) Do problems 10.8 from our textbook.

References

[1] E. K. P. Chong, S. H. Zak, *An Introduction to Optimization*, 2nd Edition, John Wiley and Sons, Inc., 2001.

[2] W. H. Press, B. P. Flannery, S. A. Teukolsky, W.T. Vetterling, *Numerical Recipes in C: The Art of Scientific Computing*, Cambridge University Press, 1988.