

Direct search optimization methods using grids and frames

**C.J. Price and I. D. Coope*

University of Canterbury, Christchurch, New Zealand

Direct search optimization methods solve optimization problems without forming or estimating derivatives. In this talk a general template for such methods is presented for problems which are unconstrained or linearly constrained. The template uses admissible sets, which may be grids, have other symmetries (eg circular) or use random elements. Convergence properties stem directly from the direct search nature of the template. However, the template is very general and can mimic a number of classical algorithms such as Nelder-Mead, conjugate directions, conjugate gradients, and quasi-Newton. Brief numerical results are presented which show methods conforming to the template are effective in practice as well as theoretically sound.