Appendix B

% Simple Genetic Algorithm in MATLAB program %

```
NIND = 40 ;                    % Number of individuals
MAXGEN = 300 ;          % Maximum no. of generations
NVAR = 20 ;                % No. of variables
PRECI = 20 ;               % Precision of variables
GGAP = 0.9 ;               % Generation gap
%  Build field descriptor ;
FieldD = [rep ( [PRECI] , [1 , NVAR] ) ; rep ([-512 ; 512] ,
...
       [1 , NVAR] ) ; rep ( [1 ; 0 ;  1 ; 1] , [1 , NVAR] ) ] ;
%  Initialise population
Chrom = crtbp ( NIND , NVAR*PRECI ) ;
gen = 0 ;                      % Counter
%  Evaluate initial population
objV  =  objfun1 ( bs2rv ( chrom , FieldD ) ) ;
While gen < MAXGEN             %  Generational loop
      %  Assign fitness values to entire population
      FitnV = ranking ( objV ) ;
      %  Select individuals for breeding
      SelCh = select ( 'sus' , Chrom , FitnV , GGAP ) ;
      %  Recombine individuals (crossover)
      SelCh = recombin ( 'xovsp' , SelCh , 0.7 ) ;
      SelCh = mut (SelCh) ;      %  Apply mutation
      %  Evaluate offspring, call objective function
      ObjVSel = objfun1 ( bs2rv ( SelCh, FieldD ) ) ;
      %  Reinsert offspring into population
      [chrom objV] = reins ( Chrom, SelCh, 1 , 1 ,ObjV ,
ObjVSel ) ;
```