```
            view([-1 -1 1]);
            xlabel('X','fontsize',14);ylabel('Y','fontsize',14);
                zlabel('Z','fontsize',14);
            hold off
        end
    end
end
```

# B.3   Soft Margin SVM (SVM$_{s3}$)

The following Matlab programs implement the method described in Section 54.12. The main function doSVMs3b is given below.

```
function [lamb,mu,alpha,beta,lambnz,munz,lamK,muK,w,b,eta,nw,fail]
= doSVMs3b (nu,rho,u,v,K)
%
%  Soft margin nu-SVM version s3
%
%  Computes eta using the duality gap
%  Needs a single support vector of type 1
%
%   p green vectors u_1, ..., u_p in n x p array u
%   q red   vectors v_1, ..., v_q in n x q array v
%
%   First builds the matrices for the dual program
%    K is a scale factor
%
p = size(u,2); q = size(v,2); n = size(u,1);
[A,c,X,P2,Pa,qa] = buildSVMs3b (nu,u,v,K);
%
%  Runs quadratic solver
%
tolr = 10^(-10); tols = 10^(-10); iternum = 80000;
[x,U,nr,ns,kk] = qsolve1(Pa, qa, A, c, rho, tolr, tols, iternum);
fprintf('nr =  %d ',nr)
fprintf('    ns =  %d ',ns)
fprintf('    kk =  %d \n',kk)
noconv = 0;
if kk > iternum
   noconv = 1;
   fprintf('** qsolve did not converge. Problem not solvable ** \n')
end
```