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function result=GradientConjugue
time=cputime ;
epsilon = 10^-6;
X(1)= 1; X(2)=1 ; alpha= 1.0; beta=0.9 ; k=0; y=fun(X) ;
gradient=grd(X); g0=grd(X) ; d=-gradient ;

normGradient=gradient*gradient';
while normGradient > epsilon
k=k+1;
alpha= 1.0 ;
f0=fun(X) ;
f1=fun(X+alpha*d) ;
if(f1<f0+alpha*beta*(g0*d'))
while(f1<f0+alpha*beta*(g0*d'))
alpha=alpha*2.0;
f1=fun(X+alpha*d) ;
end
else
while(f1>f0+alpha*beta*(g0*d'))
alpha=alpha/2.0;
f1=fun(X+alpha*d) ;
end
end
alpha=alpha;
X=X+alpha*d ;
g1=grd(X) ;
betaFR= ((norm(g1)^2)/(norm(g0)^2));
d=-g1+betaFR*d ;
g0=g1 ;
normGradient= norm(g0);
end
X
time = cputime - time
end
function f=fun(x)
f=x(1)^4+x(2)^4-(x(1)-x(2))^2;
end
function g=grd(x)
g(1)=4*x(1)^3-2*(x(1)-x(2));
g(2)= 4*x(2)^3+2*(x(1)-x(2));
end

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