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/*RM 4/1 gr. studentas DARIUS RAMANAUSKAS*/
/*Si programa skirta diodo VACH koeficientu nustatymui*/
/*Diodo VACH yra aprasoma formule, kurioje yra trys nezinomi
koeficientai,*/
/*kuriuos reikia optimizuoti konkreciam diodui. Keliuose VACH taskuose*/
/*ismatuojame diodo itampas ir sroves.Optimizavimas vykdomas pagal*/
/*kvadratine paklaida. Optimizavimo programa apskaiciuoja*/
/*optimalius koeficientus ir juos istacius i VACH formule*/
/* gauname optimalia diodo charakteristika ir galime geriau*/
/* parinkti reikiama dioda.Programa dar gali buti tobulinama.Bet realiai*/
/*reikejo parinkti tik kelis diodus, tai programos patobulinimui*/
/*neliko laiko.Mano e-mail: dickas@yahoo.com*/
# include "fi.h"
# include <stdio.h>
# include <stdlib.h>
# include <bios.h>
# include <math.h>
# define tasku_sk 4
double f (const double *x, int n)
{
int i;
double y[tasku_sk], value[tasku_sk],Ic[tasku_sk],Vbe[tasku_sk];
double norma;


Vbe[0]=0.62,Vbe[1]=0.7,Vbe[2]=0.8,Vbe[3]=0.91;
Ic[0]=0.0005,Ic[1]=0.008,Ic[2]=0.05,Ic[3]=0.2;


for(i=0;i<tasku_sk;i++)
                  {
                  y[i]=0.025*x[0]*log(Ic[i]/x[1])+Ic[i]*x[2];
                  }

norma=0;
for(i=0;i<tasku_sk;i++)
      {value[i]=(y[i]-Vbe[i])*(y[i]-Vbe[i]);
           norma=norma+value[i];}
       return(norma);
}
/*==============Definition of constraints==============*/

void constr (const double *x, int n, double *g, int ng)
 {
   /*
       ng > 0 - calculates all constaints
     ng < 0  - calculates only constraint with number (-ng)
   */
  double x1 = x [0];
  double x2 = x [1];
  double x3 = x1 * x1;
  double x4 = x2 * x2;

  if (ng > 0) {
         g [0] = 25. - x3 - x4;
         g [1] = 10. * x1 - x3 + 10. * x2 - x4 - 34.;
         g [2] = x1;
         g [3] = x2;
         }
       else
      {
           ng = -ng;
           switch (ng) {
           case 1:
                          g [0] = 25. - x3 - x4;
                   break;
           case 2:
                      g [1] = 10. * x1 - x3 + 10. * x2 - x4 - 34.;
                   break;
           case 3:
                   g [2] = x1;
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                        break;
                case 4:
                        g [3] = x2;
                        break;
                            }
                 }
         }
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