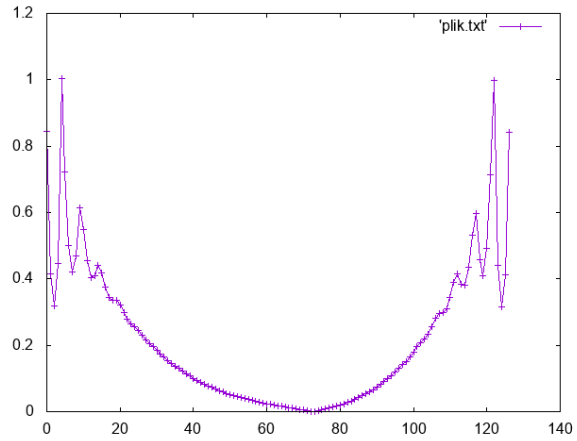
METODY NUMERYCZNE- zadanie 2 18 października 2019 Wojciech Sękowski

Graficzna prezentacja tempa zbieżności norm danych metod(GNUPLOT).

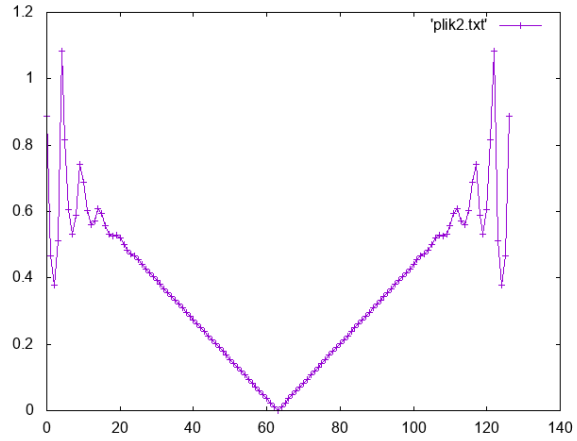
Każdej normie(x1-x128) jest przyporządkowana odpowiadająca jej wartość

Moje przybliżenie początkowe to wektor o składowych równych 1

Wykres dla Gaussa-Siedela:



Wykres dla gradientow sprzężonych:



Metoda Gaussa-Siedela posiada złożoność obliczeniową ~O(n), ponieważ to macierz pasmowa.

Metoda gradientow sprzężonych posiada złozonośc obliczeniową O(k*n^2), gdzie k=szerokośc pasma

Obydwie metody sa lepsze od rozkładu Cholesky'ego ponieważ metoda Cholesky'ego może mieć złozonośc obliczeniowa O(n^3), ponieważ będziemy przechodzić przez wszystkie 0 w macierzy

Dla wyników z małym błędem początkowym lepszy będzie algorytm Gaussa-Siedela,zaś dla wyników z dużym błędem początkowym lepszy będzie algorytm gradientow sprzężonych

Cały kod jest opisany w programach.

WYNIKI:

Wartosci dla Gaussa Siedela:

x1=0.1982913

x2=0.1237372

x3=0.160337

x4=0.1321759

x5=0.1716222

x6=0.08286551

x7=0.1466866

x8=0.1024528

x9=0.1396473

x10=0.09811997

x11=0.1523232

x12=0.1037859

x13=0.1439513

x14=0.1082084

x15=0.144405

x16=0.1054363

x17=0.1424123

x18=0.1092164

x19=0.1397066

x20=0.1100592

x21=0.139681

x22=0.1113374

x23=0.1376444

x24=0.1131054

x25=0.1365579

x26=0.1138547

x27=0.1355009

x28=0.1151771

x29=0.1342522

x30=0.1161711

x31=0.1334138

x32=0.1170616

x33=0.132452

x34=0.117989

x35=0.131631

x36=0.1187289

x37=0.1309041

x38=0.119459

x39=0.1302019

x40=0.120107

x41=0.1296023

x42=0.1206806

x43=0.1290457

x44=0.1212122

x45=0.1285481

x46=0.1216772

x47=0.1281078

x48=0.1220973

x49=0.1277092

x50=0.1224719

x51=0.127358

x52=0.122803

x53=0.1270445

x54=0.1230992

x55=0.1267657

x56=0.1233614

x57=0.1265185

x58=0.1235953

x59=0.1262971

x60=0.1238049

x61=0.1260981

x62=0.1239944

x63=0.125917

x64=0.1241684

x65=0.1257488

x66=0.1243319

x67=0.1255889

x68=0.1244896

x69=0.1254319

x70=0.1246473

x71=0.1252719

x72=0.1248112

x73=0.125103

x74=0.1249867

x75=0.1249186

x76=0.1251824

x77=0.1247099

x78=0.1254047

x79=0.1244726

x80=0.1256605

x81=0.1241941

x82=0.1259634

x83=0.123868

x84=0.1263124

x85=0.1234906

x86=0.1267273

x87=0.1230357

x88=0.1272145

x89=0.1225234

x90=0.1277618

x91=0.1219174

x92=0.1284332

x93=0.1212062

x94=0.1291537

x95=0.1204597

x96=0.1299951

x97=0.1194973

x98=0.1310067

x99=0.1185426

x100=0.1319232

x101=0.117456

x102=0.1332797

x103=0.1160111

x104=0.1344721

x105=0.1151152

x106=0.1357168

x107=0.1131762

x108=0.1379364

x109=0.1117069

x110=0.1381568

x111=0.1106649

x112=0.1410703

x113=0.1066687

x114=0.1432801

x115=0.1092322

x116=0.1430284

x117=0.1046039

x118=0.1516125

x119=0.09873095

x120=0.1391182

x121=0.1029036

x122=0.1463187

x123=0.08314678

x124=0.1714169

x125=0.1323392

x126=0.1602122

x127=0.1238184

x128=0.1982587

Wartosci dla gradientow sprzężonych:

x1=0.19986

x2=0.121552

x3=0.162844

x4=0.129411

x5=0.174738

x6=0.0790087

x7=0.15109

x8=0.0976596

x9=0.144773

x10=0.0926282

x11=0.158277

x12=0.0974205

x13=0.150655

x14=0.101208

x15=0.151699

x16=0.0978345

x17=0.150295

x18=0.101092

x19=0.14804

x20=0.101533

x21=0.148389

x22=0.102471

x23=0.146641

x24=0.104005

x25=0.145741

x26=0.104607

x27=0.144791

x28=0.105868

x29=0.143557

x30=0.106891

x31=0.142651

x32=0.107889

x33=0.141539

x34=0.109007

x35=0.140489

x36=0.110012

x37=0.139462

x38=0.111078

x39=0.138387

x40=0.112133

x41=0.137351

x42=0.113174

x43=0.136296

x44=0.114233

x45=0.135243

x46=0.115279

x47=0.134196

x48=0.116331

x49=0.133142

x50=0.117383

x51=0.132094

x52=0.118431

x53=0.131042

x54=0.119484

x55=0.129991

x56=0.120534

x57=0.12894

x58=0.121585

x59=0.127889

x60=0.122636

x61=0.126839

x62=0.123687

x63=0.125787

x64=0.124738

x65=0.124738

x66=0.125787

x67=0.123687

x68=0.126839

x69=0.122636

x70=0.127889

x71=0.121585

x72=0.12894

x73=0.120534

x74=0.129991

x75=0.119484

x76=0.131042

x77=0.118431

x78=0.132094

x79=0.117383

x80=0.133142

x81=0.116331

x82=0.134196

x83=0.115279

x84=0.135243

x85=0.114233

x86=0.136296

x87=0.113174

x88=0.137351

x89=0.112133

x90=0.138387

x91=0.111078

x92=0.139462

x93=0.110012

x94=0.140489

x95=0.109007

x96=0.141539

x97=0.107889

x98=0.142651

x99=0.106891

x100=0.143557

x101=0.105868

x102=0.144791

x103=0.104607

x104=0.145741

x105=0.104005

x106=0.146641

x107=0.102471

x108=0.148389

x109=0.101533

x110=0.14804

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x112=0.150295

x113=0.0978345

x114=0.151699

x115=0.101208

x116=0.150655

x117=0.0974205

x118=0.158277

x119=0.0926282

x120=0.144773

x121=0.0976596

x122=0.15109

x123=0.0790087

x124=0.174738

x125=0.129411

x126=0.162844

x127=0.121552

x128=0.19986