

Supplementary file of “Seeking Multiple Solutions of Combinatorial Optimization Problems: A Proof of Principle Study”

Ting Huang, Yue-Jiao Gong and Jun Zhang

Guangdong Provincial Key Lab of Computational Intelligence and Cyberspace Information

School of Computer Science and Engineering

South China University of Technology, Guangzhou 510006, China

gongyuejiao@gmail.com; junzhang@ieee.org

The supplementary file describes details of 25 Multiple solution Traveling Salesman Problem (MSTSP) instances, including the name, the category, the number of cities, the number of optima, and the length of optima. In addition, we plot the tours of overall optima. But for some instances with many optima, we only draw the representative ones.

1) MSTSP1

Name: simple1_9

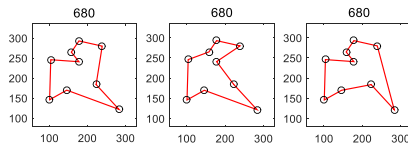
Category: simple MSTSP

Number of cities: 9

Number of optima: 3

Length of optima: 680

Figure of overall optima:



2) MSTSP2

Name: simple2_10

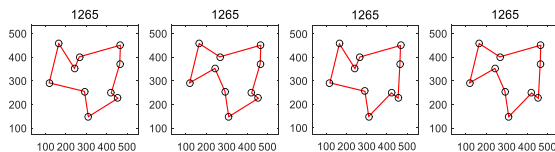
Category: simple MSTSP

Number of cities: 10

Number of optima: 4

Length of optima: 1265

Figure of overall optima:



3) MSTSP3

Name: simple3_10

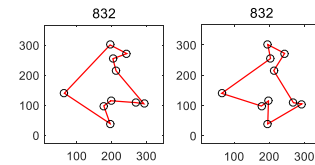
Category: simple MSTSP

Number of cities: 10

Number of optima: 13

Length of optima: 832

Figure of the representative optima:



4) MSTSP4

Name: simple4_11

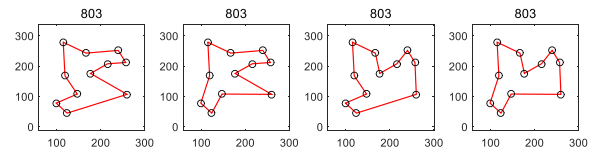
Category: simple MSTSP

Number of cities: 11

Number of optima: 4

Length of optima: 803

Figure of overall optima:



5) MSTSP5

Name: simple5_12

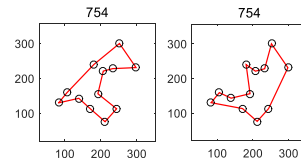
Category: simple MSTSP

Number of cities: 12

Number of optima: 2

Length of optima: 754

Figure of overall optima:



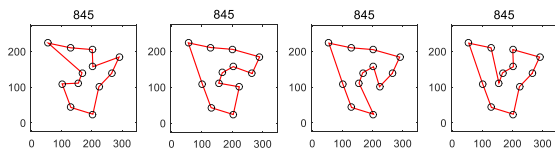
6) MSTSP6

Name: simple6_12

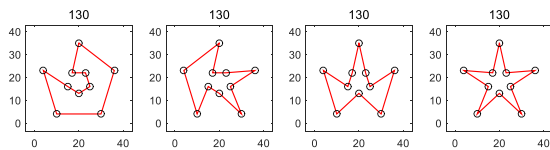
Category: simple MSTSP

Number of cities: 12

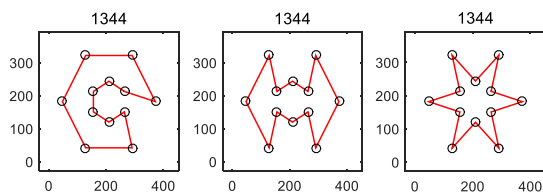
Number of optima: 4
Length of optima: 845
Figure of overall optima:



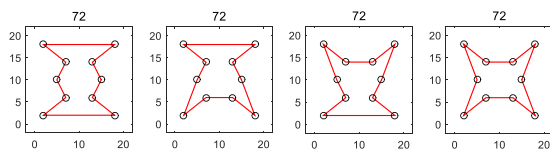
7) MSTSP7
Name: geometry1_10
Category: geometry MSTSP
Number of cities: 10
Number of optima: 56
Length of optima: 130
Figure of the representative optima:



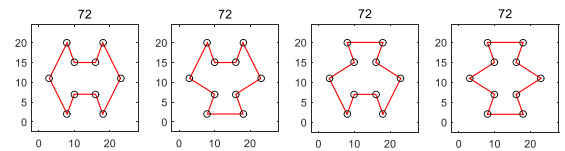
8) MSTSP8
Name: geometry2_12
Category: geometry MSTSP
Number of cities: 12
Number of optima: 110
Length of optima: 1344
Figure of the representative optima:



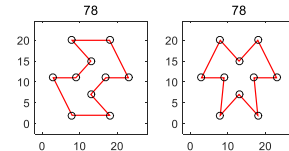
9) MSTSP9
Name: geometry3_10
Category: geometry MSTSP
Number of cities: 10
Number of optima: 4
Length of optima: 72
Figure of optima:



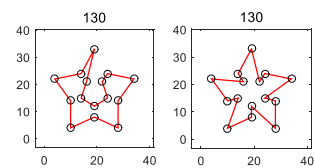
10) MSTSP10
Name: geometry4_10
Category: geometry MSTSP
Number of cities: 10
Number of optima: 4
Length of optima: 72
Figure of the representative optima:



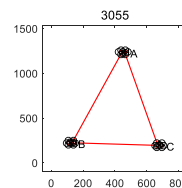
11) MSTSP11
Name: geometry5_10
Category: geometry MSTSP
Number of cities: 10
Number of optima: 14
Length of optima: 78
Figure of the representative optima:



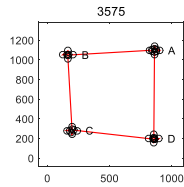
12) MSTSP12
Name: geometry6_15
Category: geometry MSTSP
Number of cities: 15
Number of optima: 196
Length of optima: 130
Figure of the representative optima:



13) MSTSP13
Name: composite1_28
Category: composite MSTSP
Number of cities: 28
Number of optima: 70
Length of optima: 3055
Figure of optima:



14) MSTSP14
Name: composite2_34
Category: composite MSTSP
Number of cities: 34
Number of optima: 16
Length of optima: 3575
Figure of optima:



15) MSTSP15

Name: composite3_22

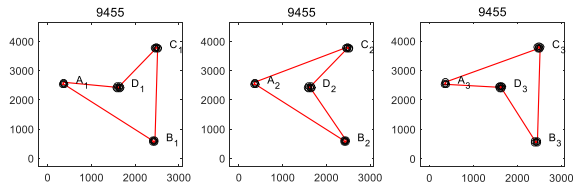
Category: composite MSTSP

Number of cities: 22

Number of optima: 72

Length of optima: 9455

Figure of optima:



16) MSTSP16

Name: composite4_33

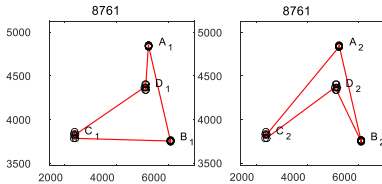
Category: composite MSTSP

Number of cities: 33

Number of optima: 64

Length of optima: 8761

Figure of optima:



17) MSTSP17

Name: composite5_35

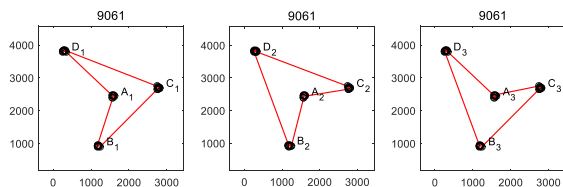
Category: composite MSTSP

Number of cities: 35

Number of optima: 10

Length of optima: 9061

Figure of optima:



18) MSTSP18

Name: composite6_39

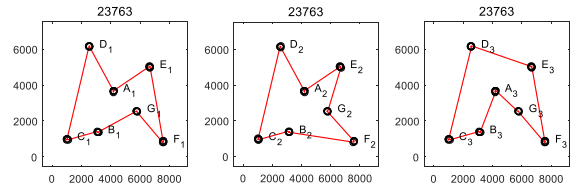
Category: composite MSTSP

Number of cities: 39

Number of optima: 20

Length of optima: 23763

Figure of optima:



19) MSTSP19

Name: composite7_42

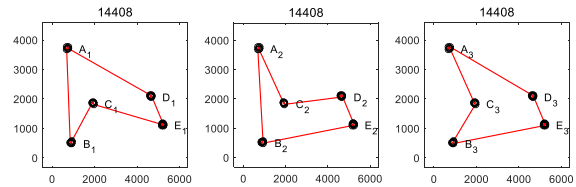
Category: composite MSTSP

Number of cities: 42

Number of optima: 20

Length of optima: 14408

Figure of optima:



20) MSTSP20

Name: composite8_45

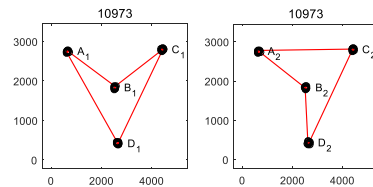
Category: composite MSTSP

Number of cities: 45

Number of optima: 20

Length of optima: 10973

Figure of optima:



21) MSTSP21

Name: composite9_48

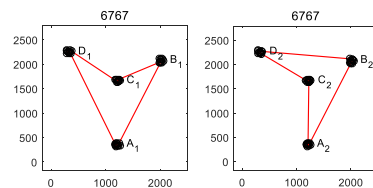
Category: composite MSTSP

Number of cities: 48

Number of optima: 4

Length of optima: 6767

Figure of optima:



22) MSTSP22

Name: composite10_55

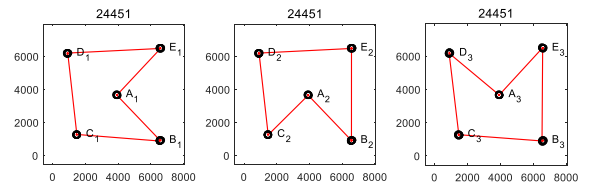
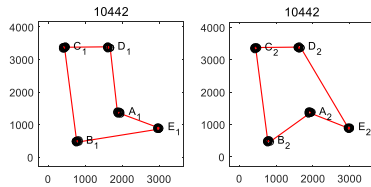
Category: composite MSTSP

Number of cities: 55

Number of optima: 9

Length of optima: 10442

Figure of optima:



23) MSTSP23

Name: composite11_59

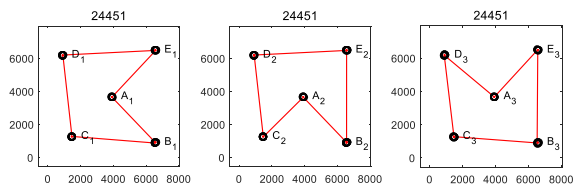
Category: composite MSTSP

Number of cities: 59

Number of optima: 10

Length of optima: 24451

Figure of optima:



24) MSTSP24

Name: composite12_60

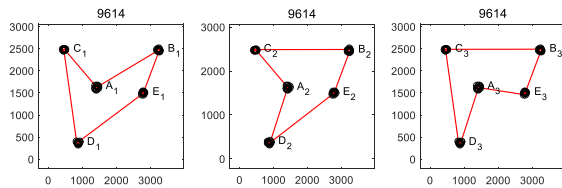
Category: composite MSTSP

Number of cities: 60

Number of optima: 36

Length of optima: 9614

Figure of optima:



25) MSTSP25

Name: composite13_66

Category: composite MSTSP

Number of cities: 66

Number of optima: 26

Length of optima: 9521

Figure of optima: