

Testset ES20FST



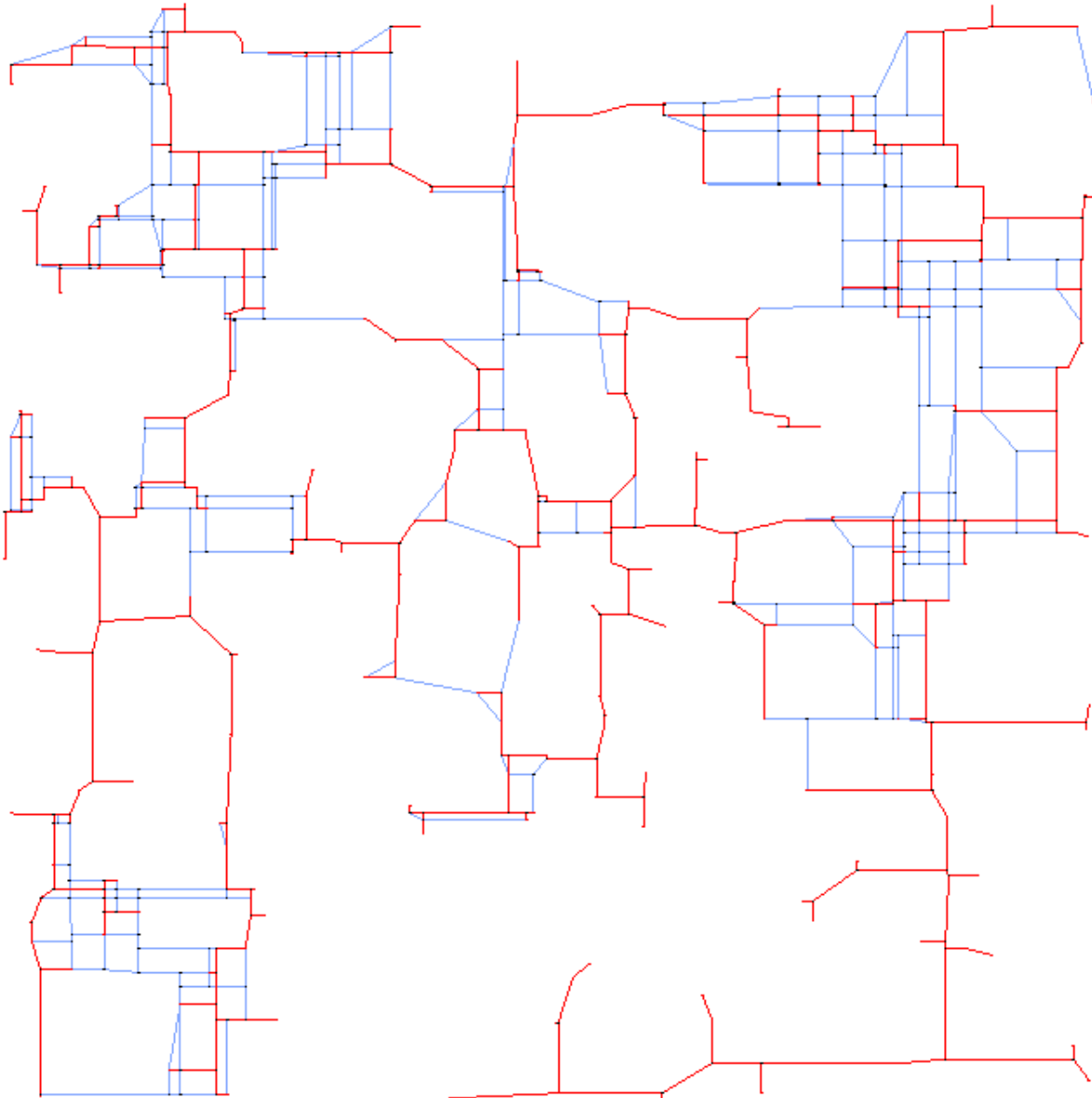
These instances are the result of the following procedure. First there were files with random generated points in the plane on a 10,000,000 by 10,000,000 grid. These points serve as terminals and were converted to rectilinear graphs with L1 edge weights, by building the Hanan grid (see [Han66](#)).

Then these graphs were preprocessed with [GeoSteiner](#) a Software for computing Full-Steiner-Sets by [M. Zachariasen](#) and [D.M. Warme](#). For a description of the Algorithm see [War97](#) and [WWZ00](#).

The original point sets are from the [OR-Library](#) named ES10 to ES10000 corresponding to the number of points given.

Some results on solving the smaller instances without FST-preprocessing are published in [KM98](#). Since there seems to be no reason why today someone should try to solve these instances without FST-preprocessing anymore we only list the preprocessed ones.

Here is an picture of *es250fst01* with solution:



The files can be found in the [download](#) section.

Name	IVI	IEI	ITI	DC	Opt
es20fst01	29	28	20	?s	33703886
es20fst02	29	28	20	?s	32639486
es20fst03	27	26	20	?s	27847417
es20fst04	57	83	20	?s	27624394
es20fst05	54	77	20	?s	34033163
es20fst06	29	28	20	?s	36014241
es20fst07	45	59	20	?s	34934874
es20fst08	52	74	20	?s	38016346
es20fst09	36	42	20	?s	36739939
es20fst10	49	67	20	?s	34024740
es20fst11	33	36	20	?s	27123908
es20fst12	33	36	20	?s	30451397
es20fst13	35	40	20	?s	34438673
es20fst14	36	44	20	?s	34062374
es20fst15	37	43	20	?s	32303746

The column **DC** classifies the difficulty of the instance.

L

Solvable by usage of local preprocessing. Typical examples are the SD-Test, BD-n Tests and FST computations. Neither a global upper nor lower bound needs to be computed.

P

Solvable by polynomial time algorithms, like dual ascent in combination with primal heuristic, a integral LP formulation or advanced preprocessing like reduced cost criteria or the RCR-Test.

NP

No polynomial time algorithm is known. Use of an exponential time enumeration scheme like Branch-and-Bound is necessary.

The letter after class gives an impression how long it takes to solve the problem using state-of-the-art soft- and hardware. **seconds** means less than a minute (this includes instances which can be solved in fractions of a second). **minutes** means less than an hour. **hours** is less than a day and **days** is less than a week. **weeks** mean it takes really a long time to solve this instance. **?** means the instance is not solved or the time is not known.

If the number in the **Opt** column is written in *italics* the optimum is not known. The number given is the best know upper bound.

Last Update : 2015/02/11 11:57:20 \$ by [Thorsten Koch](#)
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