

On the Wind Farm Cable Routing Problem Optimization via
Path-Relinking Metaheuristic ¹

¹XIII Latin and American Algorithms, Graphs and Optimization Symposium (LAGOS 2025)

ID	PR5	PR6	VNS	MAHM	ID	PR5	PR6	VNS	MAHM
1	35450199.37	35419930.79	36137387.02	36137387.02	44	37307737.22	37294006.91	37288524.19	37216452.31
2	35512897.88	35427623.05	36413001.07	36301829.53	45	38181816.02	38214758.23	38514221.17	38418495.11
3	35604100.76	36129814.67	36698915.31	35384833.29	46	37262720.65	37262720.65	37757741.40	37581625.42
4	35527096.13	35401861.56	35584476.36	35546000.69	47	37983566.12	37623246.95	37792321.71	37792321.71
5	35856152.32	35883282.87	36451245.57	36374528.86	48	38467869.18	38450191.91	38937915.05	38640580.70
6	33060684.47	33034885.69	33034885.69	33034885.69	49	36844909.46	36881322.99	37397447.60	37067375.75
7	33117636.11	32934596.94	32768823.91	32880756.14	50	37582572.99	37582572.99	37856626.24	37692603.51
8	33757801.18	33584646.58	33556494.24	33362800.92	51	43391146.88	43872917.78	44158150.73	44158150.73
9	32722768.84	32643707.29	32558914.71	32458302.71	52	43784854.49	43977191.04	43979668.95	43967209.98
10	32238103.48	32229957.07	32447828.29	32414475.25	53	44544644.08	44544644.08	45436798.67	45270784.33
11	35722722.41	35742980.79	36170625.88	35890310.24	54	43615325.45	43599073.18	44715608.01	44499886.33
12	35486655.10	35510659.99	36279714.19	36243929.87	55	43954006.88	44078070.23	44195035.47	44195035.47
13	36027542.20	36027542.20	36085731.31	36085731.31	56	41266271.89	40550524.33	41093480.67	40843827.55
14	35080524.53	35158673.89	35344332.36	35344332.36	57	38946262.36	38946262.36	40299042.77	40066049.81
15	36038301.46	36038301.46	36114792.14	36114792.14	58	41418849.02	41664997.33	41996477.08	41690634.99
16	35323866.90	35279642.92	36058588.48	35862842.51	59	39456487.31	39424664.32	40238230.88	40213529.01
17	29740957.08	29493218.50	29910565.15	29466349.22	60	39970073.17	40012561.24	40320918.77	40040582.59
18	29670667.83	29597352.53	29765159.89	29518064.54	61	43709606.10	43808031.40	44017982.16	43931812.76
19	29862168.44	29848092.54	29986956.38	29944116.73	62	44412971.95	44412971.95	44284046.52	44284046.52
20	30046674.90	30046674.90	29877594.89	29816999.44	63	45518790.98	45528094.91	45763547.36	45555465.73
21	31284646.79	31318387.36	31485561.49	31485561.49	64	42048368.40	42048368.40	42048368.40	42048368.40
22	30759998.69	30877030.68	31067193.54	31177585.98	65	42461447.13	42470475.68	42461447.13	42461447.13
23	31013102.06	31013102.06	31101340.43	31101340.43	66	43838885.74	44495440.20	44538709.73	44501590.81
24	31730026.04	31730026.04	31900432.21	31900432.21	67	95474768.54	95474768.54	96030779.97	95647520.38
25	30930205.06	30955896.39	31138473.04	31125151.84	68	99780352.55	99780352.55	99944500.43	99728297.98
26	31210144.69	31204145.61	31977806.57	31977806.57	69	92699918.32	92749490.09	92916735.16	92685203.52
27	30987238.09	31095324.13	31631914.82	31476404.91	70	89400851.92	89400851.92	89177562.21	89177562.21
28	31408652.25	31408652.25	31640493.76	31355927.65	71	86721033.64	86351211.98	86628132.31	86628132.31
29	31361081.62	31576744.71	32380932.18	32380932.18	72	88208335.58	87438773.99	86707058.61	86401745.97
30	32857347.24	32419109.86	33487633.08	33344026.00	73	90554086.81	90554086.81	90164132.80	90146928.25
31	38729336.58	38637277.46	38799219.01	38799219.01	74	84317654.34	83494073.62	83532941.25	83532941.25
32	38095582.02	38095582.02	38356787.94	38309141.30	75	84933784.82	84933784.82	84933784.82	84933784.82
33	38445658.47	38418335.16	39005388.78	38486792.68	76	98552615.50	98708361.42	99020545.77	99128712.31
34	38454647.95	38490675.79	38871165.92	38871165.92	77	99009706.64	99453990.30	99281842.66	99281842.66
35	37399971.24	37422896.61	38375226.89	37932271.70	78	101294890.99	101247237.27	101247237.27	101247237.27
36	34226699.29	34226699.29	33832701.27	33832701.27	79	94874501.19	95086901.80	95512616.37	95512616.37
37	33628655.98	33935331.15	33897624.80	33897624.80	80	94866365.64	94866365.64	94669771.04	94633319.13
38	34347051.87	34347051.87	34255690.94	34255690.94	81	95417426.64	93792286.47	94833092.97	94833092.97
39	32971434.61	32971434.61	33101065.61	32971434.61	82	95935648.03	95935648.03	96750672.21	95606294.40
40	34408137.03	34397651.49	34795657.88	34691958.41	83	98882660.17	100876394.87	100222733.65	100123827.69
41	38575206.01	38585784.43	38564627.59	38536227.93	84	95328906.17	95328906.17	97558080.79	96322724.02
42	38577993.65	38620446.57	38672298.98	38672298.98	85	90011924.79	90364536.01	90364536.01	90364536.01
43	38711573.04	38711573.04	38879718.25	38879718.25					

Table 1: Median results concerning the solution quality for small instances

ID	PR5	PR6	VNS	MAHM	ID	PR5	PR6	VNS	MAHM
86	47604116.72	47173627.01	47265528.22	47476727.04	124	50683587.34	50272209.28	50172640.79	50155576.61
87	47365871.75	46935331.88	46867861.37	46838244.88	125	50752042.90	50561186.94	50561186.94	50501854.09
88	47720557.16	47252724.84	47306353.10	47028946.61	126	62631302.86	62480078.08	62614674.80	62468092.39
89	47159202.26	47039313.84	47208915.76	47042237.85	127	64253701.12	64384743.45	64248467.10	64112498.23
90	47116709.35	46984058.88	46776565.40	46748899.27	128	64365763.97	64168032.29	64497034.89	64452928.57
91	52920269.48	52933121.85	53108381.69	52824225.44	129	62646564.59	62490392.05	62716749.34	62716749.34
92	52743654.12	52743654.12	52743654.12	52646274.04	130	62190531.35	62106305.15	61907841.67	61907841.67
93	53975624.29	54077065.68	53862048.00	53547607.50	131	57302420.08	56962880.60	57188378.07	57170822.82
94	51629949.70	51920558.94	52435825.64	51920558.94	132	57502903.44	57477910.49	57787735.17	57349018.64
95	52632072.49	52632072.49	52914176.89	52496962.09	133	58483659.20	58506532.21	58464575.26	58225842.61
96	50753709.95	50753709.95	50587817.22	50576826.34	134	56819773.48	56819773.48	56754474.41	56641047.53
97	51195504.34	51072172.63	50915282.08	50875139.59	135	58322141.08	58079390.15	58458566.39	58333739.48
98	51964178.65	51959876.14	51801855.40	51596267.00	136	66298695.11	66172968.00	66393096.30	66322704.84
99	50430733.04	50330755.65	50330755.65	50330755.65	137	64416137.65	64658626.81	64996932.07	64926526.34
100	51219458.55	51149398.66	51187823.48	51122658.33	138	66596988.46	66455065.85	66893092.55	66587798.00
101	44995253.43	44983777.08	45014385.13	44867806.21	139	64380147.24	64380147.24	65418232.39	64584401.52
102	45370619.37	45211877.55	45107656.74	45096867.70	140	66230384.96	66203630.93	66678985.40	66360243.73
103	45575716.01	45480510.56	45611440.54	45423503.97	141	62566297.76	62315894.56	62437064.59	62428115.42
104	45573651.42	45360327.51	45454195.37	45293745.93	142	62799187.97	62520287.47	62827058.70	62827058.70
105	44148160.07	43835876.33	43572873.27	43684105.94	143	63696880.31	63685304.16	63774501.50	63476297.58
106	41461403.45	41494526.29	41540088.01	41559113.96	144	60836144.92	60798736.65	60970479.04	60970479.04
107	41929130.39	41760165.44	42020094.21	41776039.24	145	63648510.38	63783509.25	63786559.25	63721892.92
108	41807260.22	41691649.74	41907299.32	41805176.99	146	136167655.04	136265382.44	135569283.21	135471555.81
109	42318550.35	42131202.61	41682944.67	41566335.46	147	134494783.22	134494783.22	134643664.76	134564433.10
110	41297680.32	41184421.59	41160527.09	41015230.68	148	137983417.51	137864436.07	138247002.72	137809866.02
111	46131530.17	46029281.73	46254903.11	46173943.83	149	132894046.74	133732345.88	133268737.77	133268737.77
112	46490113.66	46433452.49	46640043.77	46607500.12	150	116469855.15	116119961.43	117004550.59	117004550.59
113	46686096.08	46764214.81	46976539.21	46831323.53	151	141368420.32	141368420.32	140253778.86	140195526.43
114	46824447.40	46753569.32	46590121.43	46590121.43	152	142672557.74	142434620.50	143178249.00	143169236.88
115	45730146.21	45467960.96	45641419.27	45630932.04	153	147590521.01	147590521.01	146832287.59	146691128.58
116	44574707.60	44504878.90	44595997.14	44595997.14	154	138495913.66	138495913.66	138600970.21	138500253.06
117	44157888.54	44101420.41	44327542.22	44004002.68	155	136396459.85	136396459.85	136396459.85	136396459.85
118	45264863.57	45152610.05	45209994.34	45178253.24	156	132757658.72	132715359.25	132399493.31	132399493.31
119	44275711.89	44208234.54	44208234.54	44208234.54	157	132814514.77	132814514.77	132524394.56	132524394.56
120	43674685.26	43518104.29	43425112.32	43306874.28	158	140497023.83	139945110.37	139818761.47	139763146.62
121	51044485.72	50829259.29	50622604.58	50609608.06	159	131898452.23	131898452.23	131898452.23	131898452.23
122	50255782.47	50275849.59	50208714.21	50110409.72	160	131981543.73	133270237.93	133500176.36	133295389.33
123	50668713.58	50436161.77	50387724.97	50387724.97					

Table 2: Median results concerning the solution quality for medium instances

ID	PR5	PR6	VNS	MAHM	ID	PR5	PR6	VNS	MAHM
161	88139080.30	88005283.83	87751119.27	87639416.34	181	188687699.13	188687699.13	188328642.01	188328642.01
162	88788064.58	88641454.39	88451906.64	88308655.30	182	188567071.44	188567071.44	188208576.10	188137934.40
163	88352873.80	88030934.43	87504007.22	87383122.46	183	193648841.48	193648841.48	193416386.79	193413641.51
164	88053376.61	87787395.70	87618704.09	87603291.09	184	186137769.63	186137769.63	186011409.88	185888714.82
165	88210643.45	87954987.61	87803631.97	87749837.91	185	187891280.15	187891280.15	187849395.60	187717497.96
166	80444997.42	80233954.50	80005316.89	79920046.71	186	169732835.21	169732835.21	169413589.64	169253640.56
167	78508893.94	78458227.45	78286801.64	78286801.64	187	168809837.41	168389250.78	168312942.39	168298531.51
168	80941891.60	80783096.67	80668360.16	80406071.67	188	175579971.59	175579971.59	175281701.01	175172681.29
169	80064763.58	79731376.38	79589393.66	79586125.17	189	164454667.61	164454667.61	164603871.48	164524436.75
170	79752227.93	79752227.93	79520943.25	79275718.38	190	173088664.61	173088664.61	172657153.75	172484674.75
171	91067453.74	90986398.52	90988737.22	90925816.74	191	198186230.57	198160643.01	197956915.19	197873733.40
172	91032266.58	90882779.03	90841355.22	90832351.13	192	196506926.71	196441856.19	196100064.60	196172644.01
173	92175607.76	91961483.71	91984955.06	91975332.44	193	204358185.63	204210179.96	204182428.16	204182428.16
174	90268230.33	90115608.25	90071673.21	89996693.40	194	194481661.96	194487769.46	194335875.99	194202099.66
175	91448524.29	91373674.66	91386306.67	91345333.26	195	198805252.48	198805252.48	198774295.43	198720899.61
176	86514849.96	86514849.96	86044151.28	85892995.03	196	186677478.62	186677478.62	186204546.26	186204546.26
177	86827901.68	86874728.08	86099544.53	86064607.05	197	186699993.31	186699993.31	185840787.55	185840787.55
178	87765330.06	87765330.06	87383996.57	87205216.25	198	191769569.81	191769569.81	191084439.45	191084439.45
179	85729278.20	85661585.81	85546287.02	85396791.04	199	184149187.68	184149187.68	183757016.75	183687347.08
180	87930372.93	87930372.93	87440673.48	87413253.24	200	192395024.96	192395024.96	192131277.93	191866968.77

Table 3: Median results concerning the solution quality for large instances