

Table 1: The description of parameters.

Parameters	Description
<i>bms</i>	<i>bms</i> = 0 : do not perform bms strategy; <i>bms</i> = 1 : performs bms strategy.
<i>bn</i>	the parameter of bms strategy, configured when <i>bms</i> = 1.
<i>bt</i>	<i>bt</i> = 0 : breaking ties randomly; <i>bt</i> = 1 : breaking ties in favor of the largest age.
<i>cons</i>	<i>cons</i> = 0 : randomized construction; <i>cons</i> = 1 : weight-based construction; <i>cons</i> = 2 : degree-based construction.
<i>drop</i>	<i>drop</i> = 0 : weight-based selection of removed vertex; <i>drop</i> = 1 : randomized selection with a probability, otherwise weight-based selection; <i>drop</i> = 2 : randomized selection.
<i>rd_prob</i>	the probability of randomized selection of removed vertex, configured when <i>drop</i> = 1.
<i>p_rs</i>	<i>p_rs</i> = <i>False</i> : do not perform restart local search; <i>p_rs</i> = <i>True</i> : perform restart local search.
<i>res_prob</i>	the probability of performing restart local search, configured when <i>p_rs</i> = 1.
<i>p_rw</i>	<i>p_rw</i> = <i>False</i> : do not perform random walk component; <i>p_rw</i> = <i>True</i> : perform random walk component.
<i>rw_prob</i>	the probability of performing random walk.
<i>tabu</i>	the prohibition strategy, <i>tabu</i> = 0 : utilizes SCC strategy; <i>tabu</i> = 1 : utilizes tabu strategy in MN/TS; <i>tabu</i> = 2 : utilizes TabuCC strategy in this paper.
<i>tabul</i>	the tabu tenure, configured when <i>tabu</i> = 1, 2.

Table 2: The configuration space of PbO-MWC.

Parameters	Depended Conditions	Parameter Type	Value Domain	Default Value
<i>bms</i>	-	Categorical	{0,1}	1
<i>bn</i>	<i>bms</i> = 1	Integer	[1,100]	50
<i>bt</i>	-	Categorical	{0,1}	0
<i>cons</i>	-	Categorical	{0,1,2}	0
<i>drop</i>	-	Categorical	{0,1,2}	0
<i>rd_prob</i>	<i>drop</i> = 1	Categorical	{0.1,0.2,...,0.9}	0.2
<i>p_rs</i>	-	Boolean-valued	{ <i>True</i> , <i>False</i> }	<i>False</i>
<i>res_prob</i>	<i>p_rs</i> = 1	Real	[0.0000001,0.0001]	0.000001
<i>p_rw</i>	-	Boolean-valued	{ <i>True</i> , <i>False</i> }	<i>True</i>
<i>rw_prob</i>	<i>p_rw</i> = 1	Real	[0.00001,0.1]	0.0001
<i>tabu</i>	-	Categorical	{0,1,2}	1
<i>tabul</i>	<i>tabu</i> = 1, 2	Integer	[1,100]	7

Table 3: The default configuration of PbO-MWC

Instantiation	Default Configuration
Default	<i>bms</i> =1, <i>bn</i> =50, <i>bt</i> =0, <i>cons</i> =0, <i>drop</i> =0, <i>p_rs</i> =0, <i>p_rw</i> =1, <i>rw_prob</i> =1.0E-4, <i>tabu</i> =1, <i>tabul</i> =7

Table 4: The optimized configurations of PbO-MWC for all benchmarks.

Benchmark/Instance Family	Optimized Configuration
BHOSLIB	<i>bms</i> =0, <i>bt</i> =1, <i>cons</i> =1, <i>drop</i> =0, <i>p_rs</i> =1, <i>p_rw</i> =1, <i>res_prob</i> =5.016696977394702E-5, <i>rw_prob</i> =0.09733547356349166, <i>tabu</i> =1, <i>tabul</i> =5
DIMACS (MANN family)	<i>bms</i> =0, <i>bt</i> =1, <i>cons</i> =1, <i>drop</i> =1, <i>p_rs</i> =0, <i>p_rw</i> =1, <i>rd_prob</i> =0.1, <i>rw_prob</i> =0.0021339029487367554, <i>tabu</i> =0
DIMACS (except MANN family)	<i>bms</i> =0, <i>bt</i> =1, <i>cons</i> =0, <i>drop</i> =0, <i>p_rs</i> =1, <i>p_rw</i> =1, <i>res_prob</i> =3.459685410644107E-5, <i>rw_prob</i> =0.00994485968433248, <i>tabu</i> =1, <i>tabul</i> =8
KES	<i>bms</i> =1, <i>bn</i> =6, <i>bt</i> =1, <i>cons</i> =0, <i>drop</i> =2, <i>p_rs</i> =1, <i>p_rw</i> =0, <i>res_prob</i> =2.7775287025690946E-5, <i>tabu</i> =1, <i>tabul</i> =30
REF	<i>bms</i> =1, <i>bn</i> =16, <i>bt</i> =1, <i>cons</i> =0, <i>drop</i> =1, <i>p_rs</i> =1, <i>p_rw</i> =0, <i>rd_prob</i> =0.4, <i>res_prob</i> =9.44211698679448E-6, <i>tabu</i> =2, <i>tabul</i> =8