Appendix1. An example of Algorithm 2 (discretization function) in 8 steps with five candidates (w_ω .cc) and three QAs for each candidate

/* Steps 2-7 show that how to select a candidate for a dimention of a wolf
/* The question mark are the values to be determined
/* The red values in steps 2-7 denote the new values changed
/* Two red cross in step 3 denote wolves delta and beta have not suitable candidate for second dimension of new omega wolf

Suppose that:
1:
w_ω .cc= [297,1029, 302,1435,2381]
w_ω .Q= [(0.69,0.65,0.94), (0.67,0.98,0.87), (0.86,0.94,0.34), (0.59, 0.61,0.48), (0.88,0.75,0.39)]
w_ω .AQV= [0.46,0.90,0.53]
w_ω .F=0.56
and
w_α .cc= [417,160,2441,1562,937]
w_α .Q= [(0.93, 0.98, 0.79), (0.69, 0.99, 0.90), (0.90, 0.89, 0.39), (1, 0.97, 0.82), (0.93, 0.98,0.99)]
w_α .AQV= [0.53,0.96,0.79]
w_α .F= 0.83
and
w_β .cc= [375,1,687,1508,2188]
w_β .Q= [(0.98, 0.99, 0.78), (0.69, 0.99, 0.67), (0.90, 0.89, 0.91), (0.81, 0.98, 0.93), (1, 0.95, 0.85)]
w_β .AQV= [0.46,0.95,0.89]
w_β .F= 0.80
and
w_δ.cc= [192,729,1070, 1424,1251]
w_δ .Q= [(0.90, 0.96, 0.58), (0.88, 0.74, 0.95), (0.87, 0.89, 0.91), (0.78, 0.97, 0.69), (0.93, 0.92, 0.82)]
w_δ .AQV= [0.57,0.87,0.90]
w_δ .F= 0.78
and we want to determine the candidate for each dimension of the new omega wolf ($w_{\omega\text{-}new}$)
$w_{\omega\text{-}new}$ .cc= [?, ?, ?, ?, ?]
$w_{\omega\text{-}new}$ .Q= [(0.75,0.73,0.66), (0.93,0.75,0.93), (0.42,0.37,0.38), (0.59,0.66,0.68), (1.072,1.10,1.11)]
$w_{\omega\text{-}new}$ .AQV= [?,?,?]
$w_{\omega\text{-}new}$ .F=?
2:
we calculated the $w_{\omega\text{-}new}$ .Q_1=(0.75,0.73,0.66), by using the Relations 7-9 represented in section 4.2.2 in line if ($\sum_{k=1}^{3} w_\delta \,.\, Q_1^k$= 0.90+0.96+0.58 > $\sum_{k=1}^{3} w_{\omega-new} \,.\, Q_1^k$= 0.75+0.73+0.66) ---> $w_{\omega\text{-}new}$ .cc_1 =192 ---> $w_{\omega\text{-}new}$ .cc= [192, ?, ?, ?, ?] and $w_{\omega\text{-}new}$ .Q= [(0.90,0.96,0.58), (0.93,0.75,0.93), (0.42,0.37,0.38), (0.59,0.66,0.68), (1.072,1.10,1.11)]

3:
we calculated the $w_{\omega\text{-}new}$ .Q_2=(0.93,0.75,0.93), by using the Relations 7-9 represented in section 4.2.2
if ($\sum_{k=1}^{3} w_\delta \,.\, Q_2^k$= 0.88+ 0.74+ 0.95 $\ngtr$ $\sum_{k=1}^{3} w_{\omega-new} \,.\, Q_2^k$= 0.93+0.75+0.93) ✖
if ($\sum_{k=1}^{3} w_\beta . Q_2^k$= $0.69 + 0.99, +0.67 \ngtr$ $\sum_{k=1}^{3} w_{\omega-new} \,.\, Q_2^k$= 0.93+0.75+0.93) ✖

4:
if ($\sum_{k=1}^{3} w_\alpha . Q_2^k$= 0.72+ 0.99+ 0.90 > $\sum_{k=1}^{3} w_{\omega-new} \,.\, Q_2^k$= 0.93+0.75+0.93) --->$w_{\omega\text{-}new}$ .cc_2=160 ---> $w_{\omega\text{-}new}$ .cc= [192, 160, ?, ?, ?] and $w_{\omega\text{-}new}$ .Q= [(0.90,0.96,0.58), (0.72, 0.99,0.90), (0.42,0.37,0.38), (0.59,0.66,0.68), (1.072,1.10,1.11)]

5:
we calculated the $w_{\omega\text{-}new}$ .Q_3=(0.42,0.37,0.38), by using the Relations 7-9 represented in section 4.2.2

if ($\sum_{k=1}^{3} w_{\delta} . Q_3^k$= 0.87+0.89+0.91 > $\sum_{k=1}^{3} w_{\omega-new} . Q_3^k$= 0.42+0.37+0.38) --->$w_{\omega\text{-}new}$ .cc$_3$ =1070 ---> $w_{\omega\text{-}new}$ .cc= [192, 160, 1070, ?, ?] and $w_{\omega\text{-}new}$ .Q= [(0.90,0.96,0.58), (0.72, 0.99,0.90), (0.87,0.89,0.91), (0.59,0.66,0.68), (1.072,1.10,1.11)]

6:
we calculated the $w_{\omega\text{-}new}$ .Q$_4$=(0.59,0.66,0.68), by using the Relations 7-9 represented in section 4.2.2
if ($\sum_{k=1}^{3} w_{\delta} . Q_4^k$= 0.78 + 0.97 + 0.69 > $\sum_{k=1}^{3} w_{\omega-new} . Q_4^k$= 0.59+0.66+0.68) --->$w_{\omega\text{-}new}$ .cc$_4$ =1424 ---> $w_{\omega\text{-}new}$ .cc= [192, 160, 1070, 1424, ?] and $w_{\omega\text{-}new}$ .Q= [(0.90,0.96,0.58), (0.72, 0.99,0.90), (0.87,0.89,0.91), (0.78,0.97,0.69), (1.072,1.10,1.11)]

7:
we calculated the $w_{\omega\text{-}new}$ .Q$_5$=(1.072,1.10,1.11), by using the Relations 7-9 represented in section 4.2.2
if ($\sum_{k=1}^{3} w_{\delta} . Q_5^k$= 1.072 + 1.10 + 1.11 > *Upperbound=3 or* $\sum_{k=1}^{3} w_{\delta} . Q_5^k$= 1.072 + 1.10 + 1.11 < *Lowerbound=1* --->
Select a candidate randomly ---> $w_{\omega\text{-}new}$ .cc$_5$ =1990 ---> $w_{\omega\text{-}new}$ .cc= [192, 160, 1070, 1424, 1990] and $w_{\omega\text{-}new}$ .Q= [(0.90,0.96,0.58), (0.72, 0.99,0.90), (0.87,0.89,0.91), (0.78,0.97,0.69), (0.91,0.87,0.92)]
So, now we have:
$w_{\omega\text{-}new}$ .cc= [192, 160, 1070, 1424, 1990]
$w_{\omega\text{-}new}$ .Q= [(0.90,0.96,0.58), (0.72, 0.99,0.90), (0.87,0.89,0.91), (0.78,0.97,0.69), (0.91,0.87,0.92)]
$w_{\omega\text{-}new}$ .AQV= [?,?,?]
$w_{\omega\text{-}new}$ .F=?

8:
We should calculate $w_{\omega\text{-}new}$ .AQV by using graph summarization method and then we can calculate the $w_{\omega\text{-}new}$ .F by using the Relation 3. In section 4.2.1.

Appendix 2. Categorizing the selection methods

Table A-1. Categorizing the Selection Methods in Terms of Fitness

Best Fitness						
Scheffe[a]						
Method	N	Subset for alpha = 0.05				
		1	2	3	4	5
IPSO	30	.652351637177				
SFLA	30	.663735251586	.663735251587			
BGWO	30		.671092552173			
GA	30			.792307674999		
HGWO	30			.805621355484	.805621355484	
SFLAGA	30				.817317127106	
RDGWO+GA	30				.818705309643	
DEGWO	30					.841180729205
Sig.		.188	.752	.059	.069	1.000
Means for groups in homogeneous subsets are displayed.						
a. Uses Harmonic Mean Sample Size = 30.000.						

Table A-2. Categorizing the Selection Methods in Terms of Availability

Availability						
Scheffe[a]						
Method	N	Subset for alpha = 0.05				
		1	2	3	4	5
IPSO	30	.446419870790				
SFLA	30	.481733360267	.481733360267			
BGWO	30		.502277034991			
GA	30			.862055103994		
HGWO	30			.900713060262	.900713060262	
SFLAGA	30				.932948672060	
RDGWO+GA	30				.937517748630	
DEGWO	30					.993556095116
Sig.		.146	.811	.074	.109	1.000
Means for groups in homogeneous subsets are displayed.						
a. Uses Harmonic Mean Sample Size = 30.000.						

Table A-3. Categorizing the Selection Methods in Terms of Response Time

Response Time Scheffe[a]			
Method	N	Subset for alpha = 0.05	
		1	2
DEGWO	30	.015595478077	
SFLAGA	30	.029168690309	.029168690309
RDGWO+GA	30	.033071459564	.033071459564
GA	30		.036533668738
HGWO	30		.036880391840
IPSO	30		.039662988308
BGWO	30		.043100890465
SFLA	30		.044159925547
Sig.		.148	.334

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 30.000.

Table A-4. Categorizing the Selection Methods in Terms of Cost

Cost Scheffe[a]				
Method	N	Subset for alpha = 0.05		
		1	2	3
DEGWO	30	.001764183820		
SFLAGA	30	.004206413941	.004206413941	
RDGWO+GA	30	.004525990020	.004525990020	
GA	30	.005344191488	.005344191488	.005344191488
HGWO	30	.005405276349	.005405276349	.005405276349
BGWO	30		.006836413588	.006836413588
IPSO	30		.007368421052	.007368421052
SFLA	30			.009151302551
Sig.		.129	.290	.093

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 30.000.