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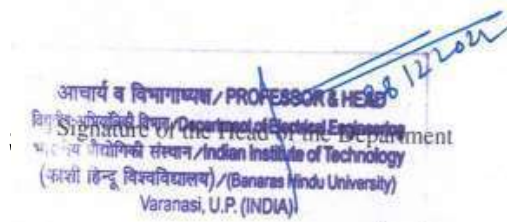
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Nomenclature

List of Greek and Roman Symbols

P_{Loss}	System active power loss
P_a	Active power injection at bus-a
Q_a	Reactive power injection at bus-a
P_b	Active power injection at bus-b
Q_b	Reactive power injection at bus-b
α_{ab}, β_{ab}	Loss coefficients
δ_a, δ_b	Voltage angles at buses a and b
V_i	Voltage in pu at bus-i
R_{ab}	Resistance of the line connecting buses a and b
X_{ab}	Reactance of the line connecting buses a and b
Z_{ab}	Impedance of the line connecting buses a and b
$P_{G,grid}^T$	Total active power injected though grid to the distribution network
$P_{G,DG}^T$	Total active power injected by DG to the distribution network
$P_{D,load}^T$	Total active power demand by the connected loads

$Q_{G,grid}^T$	Total reactive power injected though grid to the distribution network
$Q_{G,DG}^T$	Total reactive power injected by DG to the distribution network
$Q_{D,load}^T$	Total reactive power demand by the connected loads
$S_{D,load}^T$	Total apparent power demand by the connected loads
Q_{Loss}	System reactive power loss
S_{Loss}	System apparent power loss
V_{min}, V_{max}	Minimum and maximum voltage limit
I_k, I_k^{rated}	Current and rated current of branch k
P^{T-1DG}	Size of Type-1 DG in MW
Q^{T-2DG}	Size of Type-2 DG in MVAR
S^{T-3DG}	Size of Type-3 DG in MVA
\wedge	$N \times M$ reef grid
ρ_0	The ratio of free and occupied squares
F_b	Broadcast spawners
$1-F_b$	Brooders
F_d	Fraction of corals are depredated
g_{best}	Global best solution
k	Number of attempts given to a larva to settle
w	Inertia weight
c_1, c_2	Individual cognition and social learning parameter

$\lambda_1, \lambda_2, \lambda_3$	Penalty coefficient
G_{ab}	Conductance of the branch ab
B_{ab}	Susceptance of the branch ab
P_{Gi}	Active power generated at bus-i
P_{Di}	Active power demand at bus-i
Q_{Gi}	Reactive power generated at bus-i
Q_{Di}	Reactive power demand at bus-i
D	Location of prey
B, E	Penalty coefficient
χ	Position of particle
v	Velocity of particle
$G_c(t)$	Gravitational constant
$Mass_i(t)$	Mass of individual element-i
$\mathfrak{R}_{ij}(t)$	Euclidean distance between individuals
$ff_i(t)$	Fitness value
ε	Small constant
$best(t)$	Best fitness value
$worst(t)$	worst fitness value
k_b	k best agents in the population
$a_i^d(t)$	Acceleration for the iteration-t

P_{Di}^0 & Q_{Di}^0 Real and reactive power load at bus-i at nominal voltage

V_i^0 Nominal voltage at bus-i

List of Abbreviations

RDS	Radial Distribution System
DG	Distributed Generation
PSO	Particle Swarm Optimization
GWO	Grey Wolf Optimization
OF	Objective Function
VD	Voltage Deviation
VSI	Voltage Stability Index
SI	Stability Index
MOFF	Multi-Objective Fitness Function
GA	Genetic Algorithm
GSA	Gravitational Search Algorithm
PV	Photo-Voltaic
DFIG	Doubly Fed Induction Generator
MW	Mega Watt
MVA _r	Mega Volt Ampere reactive
MVA	Mega Volt Ampere
kW	kilo Watt
CRO	Coral Reef Optimization
SD	Standard Deviation

US	Unimodel Separable
UN	Unimodel Non-Separable
MS	Multimodel Separable
MN	Multimodel Non-Separable
HGWO	Hybrid GWO
CPLS	Combined Power Loss Sensitivity
MINLP	Mixed Integer Non-Linear Programming
EA-OPF	Efficient Analytical- Optimal power flow
IA	Improved Analytical
HSA-PABC	Harmonic Search Algorithm -Particle Artificial Bee Colony
SOS	Symbiotic Organism Search
WOA	Whale Optimization Algorithm
PIPSO	Parameter Improved Particle Swarm Optimization
SQP	Sequential Quadratic Programming
CP	Constant Power
CI	Constant Current
CZ	Constant Impedance
RL	Residential Load
SDRL	Summer Day Residential Load
WDRL	Winter Day Residential Load

WNRL	Winter Night Residential Load
IL	Industrial Load
CL	Commercial Load
SDCL	Summer Day Commercial Load
SNCL	Summer Night Commercial Load
WDCL	Winter Day Commercial Load
AL	Agricultural Load
EV	Electric Vehicle
CCS	Closed Switch Status
OSS	Open Switch Status
AT&C	Aggregate Technical & Commercial losses
