EAI (Excellent Artificial Intelligence) - The Beginning

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This article is a collection of five Excellent Artificial Intelligence (EAI) articles. First article defines new field Excellent Artificial Intelligence (EAI). Artificial Intelligence Researcher Algorithm version 1 (AIRAv1) is the version 1 of new algorithm designed in the first article. A new algorithm titled Teacher Brother Sister Father Mother Friend Artificial Intelligence Algorithm (TBSFMFAIA) is proposed in the Second article. Kindness Love Satisfaction Peace Excellence Money Happiness Respect Intelligence Health Artificial Intelligence Algorithm (KLSPEMHRIHAIA) is the novel and unique algorithm invented in the third article. A unique algorithm titled Prabhakar Gajawada Bhagyamma Gajawada Satish Gajawada Artificial Intelligence Algorithm (PGBGSGAIA) is proposed in the fourth article. Cricket Match Runs Algorithm (CMRA), Rice Bags Sales Algorithm (RBSA), English Language Sentence Algorithm (ELSA) and Object Swarm Optimization Algorithm (OSOA) are four novel Swarm Intelligence algorithms designed in the fifth article.

EAI Article 1

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***Abstract*—A new field titled Excellent Artificial Intelligence (EAI) is coined, invented and defined in this article. Artificial Intelligence Researcher Algorithm version 1 (AIRAv1) is the version 1 of new algorithm designed in this article. AIRAv1 proposed in this article belongs to new field EAI invented in this article.**

Keywords—Artificial Intelligence, AI, Excellent Artificial Intelligence, EAI, Artificial Intelligence Researcher Algorithm, AIRAv1

I. INTRODUCTION

Articles [1] to [5] show relevant literature. A new field and a new algorithm which belongs to this new field are defined in this article. Section 2 shows initial definition of new field titled Excellent Artificial Intelligence (EAI). Artificial Intelligence Researcher Algorithm version 1 (AIRAv1) is explained in Section 3. Section 4 shows Conclusions made. References are available at the end.

II. DEFINITION OF EXCELLENT ARTIFICIAL INTELLIGENCE

This is the initial definition of Excellent Artificial Intelligence (EAI). EAI is a new field which is the collection of following fields:

1) Teacher Inspired Artificial Intelligence (TIAI): AI algorithms inspired by Teacher.
2) Brother Inspired Artificial Intelligence (BIAI): AI algorithms inspired by Brother.
3) Sister Inspired Artificial Intelligence (SiIAI): AI algorithms inspired by Sister.
4) Father Inspired Artificial Intelligence (FIAI): AI algorithms inspired by Father.
5) Mother Inspired Artificial Intelligence (MIAI): AI algorithms inspired by Mother.
6) Friend Inspired Artificial Intelligence (FrIAI): AI algorithms inspired by Friend.
7) Kindness Inspired Artificial Intelligence (KIAI): AI algorithms inspired by Kindness.
8) Love Inspired Artificial Intelligence (LIAI): AI algorithms inspired by Love.
9) Satisfaction Inspired Artificial Intelligence (SIAI): AI algorithms inspired by Satisfaction.
10) Peace Inspired Artificial Intelligence (PIAI): AI algorithms inspired by Peace.
11) Excellence Inspired Artificial Intelligence (EIAI): AI algorithms inspired by Excellence.
12) Money Inspired Artificial Intelligence (MyIAI): AI algorithms inspired by Money.
13) Happiness Inspired Artificial Intelligence (HaIAI): AI algorithms inspired by Happiness.
14) Respect Inspired Artificial Intelligence (RIAI): AI algorithms inspired by Respect.
15) Health Inspired Artificial Intelligence (HeIAI): AI algorithms inspired by Health.
16) Soul Inspired Artificial Intelligence (SoIAI): AI algorithms inspired by Soul.
17) GOD Inspired Artificial Intelligence (GODIAI): AI algorithms inspired by GOD.
18) Human Inspired Artificial Intelligence (HIAI): AI algorithms inspired by Human.
19) Artificial Intelligence Researcher Inspired Artificial Intelligence (AIRIAI): AI algorithms inspired by Artificial Intelligence Researcher.

III. ARTIFICIAL INTELLIGENCE RESEARCHER ALGORITHM VERSION 1

Artificial Intelligence Researcher Algorithm version 1 (AIRAv1) is explained in this section. Population of Artificial Intelligence researchers is initialized in line no. 1. Generation count is set to 0. Best_AI_Researcher and Worst_AI_Researcher are identified in lines 3 and 4. Probability of AI for GOOD and probability of AI for BAD are shown in lines 5 and 6. In line no. 7, for each Artificial Intelligence Researcher loop is started. Based on random number "R" generated and probabilities, the current AI Researcher may move along GOOD direction or BAD direction. Line no. 12 shows position update equation where current AI Researcher moves along GOOD direction. Line no. 16 shows position update equation where current AI Researcher moves along BAD direction. For each AI Researcher loop is ended in line no. 17. Generation count is incremented by 1. This process is continued until termination condition reached is True in line no. 19.

Procedure: Artificial Intelligence Researcher Algorithm version 1 (AIRAv1)

1) Initialize Population of Artificial Intelligence Researchers
2) Generation = 0
3) Identify Best_AI_Researcher with best fitness value
4) Identify Worst_AI_Researcher with worst fitness value
5) AI_for_GOOD_Probability = 0.75
6) AI_for_BAD_Probability = 0.25
7) for each Artificial Intelligence Researcher:
8) Generate a random number "R"
9) if 0 < R < 0.75:
10) GOOD_Direction = Best_AI_Researcher - Artificial Intelligence Researcher
11) Convert GOOD_Direction into unit vector
12) position = position + GOOD_Direction*Step
13) if 0.75 < R < 1:
14) BAD_Direction = Worst_AI_Researcher - Artificial Intelligence Researcher
15) Convert BAD_Direction into unit vector
16) position = position + BAD_Direction*Step
17) End for each Artificial Intelligence Researcher Loop
18) Generation = Generation + 1
19) Loop until termination condition reached is True

IV. CONCLUSIONS

A new field Excellent Artificial Intelligence (EAI) and a new algorithm Artificial Intelligence Researcher Algorithm version 1 (AIRAv1) are invented in this article. The initial

definition of EAI field and the version 1 of Artificial Intelligence Researcher Algorithm are shown in this article. More novel and unique algorithms may be created, invented and defined by moving in the direction shown in this article.

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EAI Article 2

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***Abstract*—Swarm intelligence is an active area of research. A new algorithm titled Teacher Brother Sister Father Mother Friend Artificial Intelligence Algorithm (TBSFMFAIA) is proposed in this article. The proposed TBSFMFAIA Artificial intelligence algorithm belongs to Human Swarm Optimization (HSO) field.**

Keywords—Artificial Intelligence, Swarm Intelligence, Teacher, Brother, Sister, Father, Mother, Friend, TBSFMFAIA

I. INTRODUCTION

Relevant Artificial Intelligence literature is shown in articles [1] to [8]. A unique and novel algorithm titled Teacher Brother Sister Father Mother Friend Artificial Intelligence Algorithm (TBSFMFAIA) is designed in this article. Section 2 shows designed TBSFMFAIA algorithm. Conclusions are made in section 3 followed by References.

II. TEACHER BROTHER SISTER FATHER MOTHER FRIEND ARTIFICIAL INTELLIGENCE ALGORITHM

Population Initialization is done in lines 1 to 6. Coefficients are set in lines 7 to 12. Probabilities are initialized in lines 13 to 19. Human Population is initialized in line no. 20. Generation is set to 0. For each Human loop is started in line no. 22. Based on random number generated and probabilities, Human moves towards either Teacher or Brother or Sister or Father or Mother or Friend. Line no. 25 shows Direction of movement towards Teacher. This Direction is converted to unit vector. Line no. 27 shows position update equation. The Human moves towards Teacher along Direction and magnitude of this movement is Towards_Teacher_Coefficient multiplied by Step value. Lines 28 to 31 shows movement of Human towards Brother. Lines 32 to 47 shows other movement of Human towards Sister, Father, Mother and Friend respectively. Lines 48 to 49 shows idle movement. The position remains as it is. In line no. 50. For each Human loop is ended. Generation counter is incremented by 1. Teacher, Brother, Sister, Father, Mother and Friend populations are Updated in lines 52 to 57. This process is continued until termination condition is reached in line no. 58.

Procedure: Teacher Brother Sister Father Mother Friend Artificial Intelligence Algorithm (TBSFMFAIA)
1) Initialize Teacher Population
2) Initialize Brother Population
3) Initialize Sister Population
4) Initialize Father Population
5) Initialize Mother Population
6) Initialize Friend Population
7) Towards_Teacher_Coefficient = 0.3
8) Towards_Brother_Coefficient = 0.4
9) Towards_Sister_Coefficient = 0.4
10) Towards_Father_Coefficient = 0.5
11) Towards_Mother_Coefficient = 0.5
12) Towards_Friend_Coefficient = 0.3
13) Teacher_Probability = 0.15
14) Brother_Probability = 0.15
15) Sister_Probability = 0.15
16) Father_ Probability = 0.15
17) Mother_ Probability = 0.15
18) Friend_ Probability = 0.15
19) Idle_Probability=0.1
20) Initialize Human Population
21) Generation = 0
22) for each Human loop:
23) Generate random number "R"
24) If 0 < R < 0.15 then
25) Direction = Teacher – Human
26) Convert Direction to unit vector
27) Position = position + Direction* Towards_Teacher_Coefficient*Step
28) If 0.15 < R < 0.30 then
29) Direction = Brother – Human
30) Convert Direction to unit vector
31) Position = position + Direction* Towards_Brother_Coefficient*Step
32) If 0.30 < R < 0.45 then
33) Direction = Sister – Human
34) Convert Direction to unit vector
35) Position = position + Direction* Towards_Sister_Coefficient*Step
36) If 0.45 < R < 0.6 then
37) Direction = Father – Human
38) Convert Direction to unit vector
39) Position = position + Direction* Towards_Father_Coefficient*Step
40) If 0.6 < R < 0.75 then
41) Direction = Moother – Human
42) Convert Direction to unit vector
43) Position = position + Direction* Towards_Mother_Coefficient*Step
44) If 0.75 < R < 0.9 then
45) Direction = Friend – Human
46) Convert Direction to unit vector
47) Position = position + Direction* Towards_Friend_Coefficient*Step
48) If 0.9 < R < 1 then
49) Position = position
50) End for each Human loop
51) Generation = Generation + 1
52) Update Teacher Population
53 Update Brother Population
54) Update Sister Population
55) Update Father Population
56) Update Mother Population
57) Update Friend Population
58) Loop until termination condition is reached

III. Conclusions

An interesting algorithm titled Teacher Brother Sister Father Mother Friend Artificial Intelligence Algorithm (TBSFMFAIA) is designed and shown in this article. There is scope to change Towards_Teacher_Coefficient and other coefficients. One can try and experiment with different probabilities like Teacher_Probability that are present in TBSFMFAIA algorithm. This is just the beginning of Teacher Brother Sister Father Mother Friend Artificial Intelligence Algorithm (TBSFMFAIA) algorithm. One may create several unique and new algorithms by taking inspiration from TBSFMFAIA algorithm designed in this article.

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EAI Article 3

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***Abstract*—Kindness Love Satisfaction Peace Excellence Money Happiness Respect Intelligence Health Artificial Intelligence Algorithm (KLSPEMHRIHAIA) is the novel and unique algorithm invented in this article. This algorithm belongs to Human Swarm Optimization (HSO) field.**

Keywords—Human Swarm Optimization, HSO, Swarm Intelligence, Artificial Intelligence, Kindness, Love, Satisfaction, Peace, Excellence, Money, Happiness, Respect, Intelligence, Health, KLSPEMHRIHAIA

I. INTRODUCTION

Relevant Artificial intelligence literature is shown in articles [1] to [5]. An interesting algorithm titled Kindness Love Satisfaction Peace Excellence Money Happiness Respect Intelligence Health Artificial Intelligence Algorithm (KLSPEMHRIHAIA) is designed in this article. Invented KLSPEMHRIHAIA algorithm is explained in Section 2. Section 3 shows the Conclusions made. References are available at the end.

II. KINDNESS LOVE SATISFACTION PEACE EXCELLENCE MONEY HAPPINESS RESPECT INTELLIGENCE HEALTH ARTIFICIAL INTELLIGENCE ALGORITHM

Ten different Arrays are initialized in lines [1] to [10]. Generation is set to 0. Best Humans are identified in lines 12 to 21. In line no. 22 for each Human loop is started. Human moves along 10 different Directions as shown in lines 23 to 32 . Unit Vectors of all directions are obtained in line no. 33. Line no. 34 shows position update equation. Human moves along the combination of ten Directions as shown in position update equation. For each Human loop is ended in line no. 35. Generation count is incremented by 1. Lines 37 to 46 updates all the ten different arrays. This process continues until termination condition is reached in line no. 47.

Procedure: Kindness Love Satisfaction Peace Excellence Money Happiness Respect Intelligence Health Artificial Intelligence Algorithm (KLSPEMHRIHAIA)
1) Initialize Kindness_Array
2) Initialize Love_Array
3) Initialize Satisfaction_Array
4) Initialize Peace_Array
5) Initialize Excellence_Array
6) Initialize Money_Array
7) Initialize Happiness_Array
8) Initialize Respect_Array
9) Initialize Intelligence_Array
10) Initialize Health_Array
11) Generation = 0
12) Best_Kindness_Human = Human with best Kindness value
13) Best_Love_Human = Human with best Love value
14) Best_Satisfaction_Human = Human with best Satisfaction value
15) Best_Peace_Human = Human with best Peace value
16) Best_Excellence_Human = Human with best Excellence value
17) Best_Money_Human = Human with best Money value
18) Best_Happiness_Human = Human with best Happiness value
19) Best_Respect_Human = Human with best Respect value
20) Best_Intelligence_Human = Human with best Intelligence value
21) Best_Health_Human = Human with best Health value
22) for each Human:
23) Direction1 = Best_Kindness_Human – Human
24) Direction2 = Best_Love_Human – Human
25) Direction3 = Best_Satisfaction_Human – Human
26) Direction4 = Best_Peace_Human – Human
27) Direction5 = Best_Excellence_Human – Human
28) Direction6 = Best_Money_Human – Human
29) Direction7 = Best_Hap[piness_Human – Human
30) Direction8 = Best_Respect_Human – Human
31) Direction9 = Best_Intelligence_Human – Human
32) Direction10 = Best_Health_Human – Human
33) Convert all 10 Directions into unit Vectors
34) position = position +
0.1*Direction1*Step +
0.1*Direction2*Step +
0.1*Direction3*Step +
0.1*Direction4*Step +
0.1*Direction5*Step +
0.1*Direction6*Step +
0.1*Direction7*Step +
0.1*Direction8*Step +
0.1*Direction9*Step +
0.1*Direction10*Step
35) end for each Human loop
36) Generation = Generation + 1
37) Update Kindness_Array
38) Update Love_Array
39) Update Satisfaction_Array
40) Update Peace_Array
41) Update Excellence_Array
42) Update Money_Array
43) Update Happiness_Array
44) Update Respect_Array
45) Update Intelligence_Array
46) Update Health_Array
47) Loop until termination condition reached is True

III. CONCLUSIONS

An innovative algorithm titled KLSPEMHRIHAIA algorithm which is based on Kindness, Love, Satisfaction, Peace, Excellence, Money, Happiness, Respect, Intelligence, Health is designed in this article. In this algorithm Human moves along the combination of ten different directions. This is just the beginning of KLSPEMHRIHAIA algorithm. Many unique and novel algorithms may be invented by taking inspiration from KLSPEMHRIHAIA algorithm designed in this article.

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EAI Article 4

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***Abstract*—Many Human Swarm Optimization (HSO) algorithms were proposed in literature. These algorithms are based on Humans in general. But every Human is unique. Hence in this paper a novel algorithm based on 3 Humans Satish Gajawada, Prabhakar Gajawada and Bhagyamma Gajawada has been designed. Satish Gajawada is the son of Prabhakar Gajawada and Bhagyamma Gajawada. A unique algorithm titled Prabhakar Gajawada Bhagyamma Gajawada Satish Gajawada Artificial Intelligence Algorithm (PGBGSGAIA) is proposed in this article.**

Keywords—Artificial Intelligence, Swarm Intelligence, Human Swarm Optimization, Prabhakar Gajawada, Bhagyamma Gajawada, Satish Gajawada, Prabhakar Gajawada Bhagyamma Gajawada Satish Gajawada Artificial Intelligence Algorithm, PGBGSGAIA

I. Introduction

Relevant Swarm Intelligence literature is shown in articles [1] to [6]. In this article, an interesting algorithm titled Prabhakar Gajawada Bhagyamma Gajawada Satish Gajawada Artificial Intelligence Algorithm (PGBGSGAIA) has been designed. Section 2 explains proposed PGBGSGAIA algorithm. Conclusions are made in Section 3 followed by references.

II. Prabhakar Gajawada Bhagyamma Gajawada Satish Gajawada Artificial Intelligence Algorithm

The Population is initialized in first 3 lines. Generation count is set to 0. Best individuals are found in lines 5 to 7. For each Satish Gajawada loop is started in line no. 8. Based on Random Number generated and probabilities, Satish Gajawada moves along Best Prabhakar Gajawada or Best Bhagyamma Gajawada or Best Satish Gajawada or along combination of three directions. Position update equations are shown in lines 13, 17, 21 and 27. Line no. 28 ends for each Satish Gajawada loop. Population is updated in lines 29 and 30. Generation count is incremented by 1. This process is continued until termination condition is reached in line no. 32.

Procedure: Prabhakar Gajawada Bhagyamma Gajawada Satish Gajawada Artificial Intelligence Algorithm (PGBGSGAIA)
1) Initialize Prabhakar Gajawada Population
2) Initialize Bhagyamma Gajawada Population
3) Initialize Satish Gajawada Population
4) Set Generation = 0
5) Identify Best Prabhakar Gajawada with best fitness value
6) Identify Best Bhagyamma Gajawada with best fitness value
7) Identify Best Satish Gajawada with best fitness value
8) Loop for each Satish Gajawada:
9) Generate Random number “R”
10) if 0 < R < 0.25:
11) Direction = Best Prabhakar Gajawada – Satish Gajawada
12) Convert Direction into Unit Vector
13) position = position + Direction*Step
14) if 0.25 < R < 0.50:
15) Direction = Best Bhagyamma Gajawada – Satish Gajawada
16) Convert Direction into Unit Vector
17) position = position + Direction*Step
18) if 0.50 < R < 0.75:
19) Direction = Best Satish Gajawada – Satish Gajawada
20) Convert Direction into Unit Vector
21) position = position + Direction*Step
22) if 0.75 < R < 1:
23) Direction1 = Best Prabhakar Gajawada – Satish Gajawada
24) Direction2 = Best Bhagyamma Gajawada – Satish Gajawada
25) Direction3 = Best Satish Gajawada – Satish Gajawada
26) Convert Direction1, Direction2 and Direction3 into Unit Vectors
27) position = position + 0.33*Direction1*Step + 0.33*Direction2*Step + 0.34*Direction3*Step
28) End for each Satish Gajawada loop
29) Update Prabhakar Gajawada Population
30) Update Bhagyamma Gajawada Population
31) Generation = Generation + 1
32) Loop until termination condition reached is true

III. Conclusions

An innovative algorithm which is based on 3 Humans Prabhakar Gajawada, Bhagyamma Gajawada and Satish Gajawada is invented in this article. Satish Gajawada moves along the direction of Best Prabhakar Gajawada or Best Bhagyamma Gajawada or Best Satish Gajawada or combination of these three directions. PGBGSGAIA algorithm proposed in this article is just the beginning. One may move in the direction shown in this article to design more unique, interesting and innovative algorithms.

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EAI Article 5

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***Abstract*—This article contributes four unique Artificial Intelligence algorithms to Swarm Intelligence which is an active area of research. Cricket Match Runs Algorithm (CMRA), Rice Bags Sales Algorithm (RBSA), English Language Sentence Algorithm (ELSA) and Object Swarm Optimization Algorithm (OSOA) are four novel Swarm Intelligence algorithms designed in this article. CMRA, RBSA and ELSA belongs to Human Swarm Optimization (HSO) field. The Object Swarm Optimization Algorithm (OSOA) does not belong to any particular category of Swarm Intelligence like Particle Swarm Optimization or Human Swarm Optimization but it belongs to Object Swarm Optimization where Objects move in search space. Hence OSOA belongs to Object Swarm Intelligence.**

Keywords—Cricket match, CMRA, Rice Bags, RBSA, English sentence, ELSA, Objects, OSOA, Swarm Intelligence, Object Swarm Intelligence, Human Swarm Optimization, HSO, Artificial Intelligence

I. Introduction

Articles [1] to [5] show literature related to Swarm Intelligence. Four Artificial Intelligence algorithms are designed in this work. Section 2 shows Cricket Match Runs Algorithm (CMRA). Rice Bags Sales Algorithm (RBSA) is shown in Section 3. Section 4 shows English Language Sentence Algorithm (ELSA). Object Swarm Optimization Algorithm (OSOA) is shown in Section 5. Conclusions are made in Section 6 followed by references at the end.

II. Cricket Match Runs Algorithm

The Runs scored in a cricket match are stored in Cricket_Runs_Scored Array. In line no. 2 the ball number is set to 1. Population of Humans is initialized in line no. 3. In 4th line, Generation counter is set to 1. Line no. 5 identifies Best_Human with best fitness value. In line no. 6 for each Human loop is started. Direction is calculated in lines 7 and 8. Line no. 9 shows position update equation. The Human moves along the Best_Human direction and the magnitude of this movement is Cricket_Runs_Scored[ball] which is nothing but the runs scored in the current ball. The ball is incremented by 1. Line no. 11 ends for each Human loop. The Generation is incremented by 1. This process is continued until termination condition is reached in line no. 13.

Procedure: Cricket Match Runs Algorithm (CMRA)
1) Initialize Cricket_Runs_Scored Array
2) Set ball = 1
3) Initialize Population of Humans
4) Set Generation = 1
5) Identify Best_Human with best fitness value
6) for each Human:
7) Direction = Best_Human – Human
8) Convert Direction into unit vector
9) position = position + Direction*Cricket_Runs_Scored[ball]
10) ball = ball + 1
11) end for each Human loop
12) Generation = Generation + 1
13) Loop until termination condition is reached

III. Rice Bags Sales Algorithm

Probabilities of number of Rice Bags sold to current customer are initialized in first four lines. Population of Humans is initialized and Generation count is set to 1. Best_Human with best fitness value is identified. In line no. 8, for each Human loop is started. Direction of movement is calculated in lines 9 and 10. The position update equation is based on random number generated and probabilities. Human moves along Direction and magnitude of this movement is equal to the number of Rice Bags lifted or sold to customer. This is shown in lines 12 to 19. In line no. 20, for each Human loop is ended. Generation count is incremented by 1. This process is continued until termination condition is reached in line no. 22.

Procedure: Rice Bags Sales Algorithm (RBSA)
1) One_Rice_Bag_Lifted_Probability = 0.5
2) Two_Rice_Bags_Lifted_Probability = 0.25
3) Three_Rice_Bags_Lifted_Probability = 0.125
4) Four_Or_More_Rice_Bags_Lifted_Probability = 0.125
5) Initialize Population of Humans
6) Set Generation = 1
7) Identify Best_Human with best fitness value
8) for each Human:
9) Direction = Best_Human – Human
10) Convert Direction into unit vector
11) Generate Random Number “R”
12) if 0 < R < 0.5 then
13) position = position + Direction*1
14) if 0.5 < R < 0.75 then
15) position = position + Direction*2
16) if 0.75 < R < 0.875 then
17) position = position + Direction*3
18)if 0.875 < R < 1 then
19) position = position + Direction*4
20) end for each Human loop
21) Generation = Generation + 1
22) Loop until termination condition is reached

IV. English Language Sentence Algorithm

Ten English Sentences are selected in line no. 1. Sentence_Length_Array contains the length of 10 sentences. Population of Humans is initialized and Generation count is set to 1. In line no. 5, Best_Human with best fitness value is

identified. For each Human loop is started in line no. 6. Direction of movement is calculated in lines 7 and 8. Each sentence is selected with a probability 0.1. The position update equation depends on random number R and probabilities. The Human moves along the Direction and magnitude of this movement is Sentence_Length_Array[Sentence_Number_Selected]. This is shown in lines 10 to 29. For each Human loop is ended in line no. 30. Generation count is incremented by 1. This process is continued until termination condition is reached in line no. 32.

Procedure: English Language Sentence Algorithm (ELSA)
1) Select 10 English Sentences
2) Calculate Sentence_Length_Array
3) Initialize Population of Humans
4) Set Generation = 1
5) Identify Best_Human with best fitness value
6) for each Human:
7) Direction = Best_Human – Human
8) Convert Direction into unit vector
9) Generate Random Number "R"
10) if 0 < R < 0.1 then
11) position = position +
Direction* Sentence_Length_Array[1]
12) if 0.1 < R < 0.2 then
13) position = position +
Direction* Sentence_Length_Array[2]
14) if 0.2 < R < 0.3 then
15) position = position +
Direction* Sentence_Length_Array[3]
16) if 0.3 < R < 0.4 then
17) position = position +
Direction* Sentence_Length_Array[4]
18) if 0.4 < R < 0.5 then
19) position = position +
Direction* Sentence_Length_Array[5]
20) if 0.5 < R < 0.6 then
21) position = position +
Direction* Sentence_Length_Array[6]
22) if 0.6 < R < 0.7 then
23) position = position +
Direction* Sentence_Length_Array[7]
24) if 0.7 < R < 0.8 then
25) position = position +
Direction* Sentence_Length_Array[8]
26) if 0.8 < R < 0.9 then
27) position = position +
Direction* Sentence_Length_Array[9]
28) if 0.9 < R < 1 then
29) position = position +
Direction* Sentence_Length_Array[10]
30) end for each Human loop
31) Generation = Generation + 1
32) Loop until termination condition is reached

V. Object Swarm optimization algorithm

The position of objects is initialized in line no. 1. Generation count is set to 1. In line no. 3, Best_Object with best fitness value is identified. For each Object loop is started in line no. 4. The Direction of movement is calculated in lines 5 and 6. Rotate_Direction Probabilities are initialized. Based on Random number generated and probabilities, the Direction vector is rotated. Position update equation is shown in line number. 17. The Object moves along Direction and magnitude of this movement is Step value. In line no. 18, for each Object loop is ended. Generation counter is incremented by 1. This process is continued until termination condition is reached in line no. 20.

Procedure: Object Swarm Optimization Algorithm (OSOA)
1) Initialize position of Objects in Search Space
2) Set Generation = 1
3) Identify Best_Object with best fitness value
4) for each Object:
5) Direction = Best_Object – Object
6) Convert Direction into unit vector
7) Rotate_Direction_By_Zero_Degrees_Probability = 0.8
8) Rotate_Direction_By_Five_Degrees_Probability = 0.1
9) Rotate_Direction_By_Minus_Five_Degrees_Probability
= 0.1
10) Generate Random Number "R"
11) if 0 < R < 0.8 then
12) do nothing
13) if 0.8 < R < 0.9 then
14) Rotate Direction by 5 Degrees
15) if 0.9 < R < 1 then
16) Rotate Direction by -5 Degrees
17) position = position +
Direction*Step
18) end for each Object loop
19) Generation = Generation + 1
20) Loop until termination condition is reached

VI. Conclusions

This article designed four unique Swarm Intelligence algorithms CMRA, RBSA, ELSA, and OSOA. CMRA is inspired by Cricket match. RBSA is inspired by Rice Bags Sales. ELSA is inspired by Sentences in English. The final algorithm OSOA belongs to Object Swarm Intelligence. Objects move in search space in OSOA algorithm. The first three algorithms CMRA, RBSA and ELSA belong to Human Swarm Optimization field. Artificial Humans move in search space in these three algorithms.

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