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EMOTIONALLY INTELLIGENT ALGORITHMS DEALING SOME PRACTICAL COMBINATORIAL PROBLEMS

SAPTARSHI NASKAR*[1], TANMOY BISWAS[2] AND SAMAR SEN SARMA[3]

[1]Assistant Professor, Dept. of CS, Sarsuna College, (University of Calcutta), India.

[2]Assistant Professor, Dept. of CS, Syamaprasad College, (University of Calcutta), India.

[3]Retd. Professor, Dept. of CSE, (University of Calcutta), India.

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ABSTRACT

As per the research in the field of Neuro Sciences, our Subconscious mind actually controls our emergency motor neurons for smooth functioning our most vital mussels such as Heart, Lungs, Kidneys, Brain and other internal and external mussels to live us bypassing conscious logical decisions making memory, the conscious memory, and that is why our subconscious memory functions the most important role to live us and to deal with internal and external problems. This subconscious mind controls our emotions. That is why the emotionally intelligent human can take better decisions than a machine.

The aim of this paper is to make man machine interaction more efficient by using emotionally intelligent combinatorial algorithms.

Key Words: *Emotional Intelligence (EI), Emotionally Intelligent Algorithm (EIA)*

Definition 1: Emotional Intelligence (EI)
From medical Science point of view-The capacity to be aware of, control and express one’s emotions and to handle interpersonal relationships judiciously and empathically.

Definition 2: Emotionally Intelligent Algorithm (EIA):
Literally in practical daily life some time we do some work by emotion, apparently it is for something different than the desired problem’s solution, but the side effect of the work actually solves the target problem indirectly. Thus by not attacking the problem directly, but dealing it diplomatically to solve it efficiently, without loosing so much energy, we call these algorithms as Emotionally Intelligent Algorithms.

PROCEDURE: GRAY_CODE_MAT

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Step1:      GM(i)←i  ∀i=1, 2, 3,…
Step2:      Copy Entire GM to TGM
Step3:      i←0, r←0
Step4:      If TGM(i)≠0 Then Continue Else Goto Step 14
Step5:          n=PAT(r)=TGM(i)
Step6:          r←r+1
Step7:          Shift Left one bit of TGM
Step8:          j=Position of n in GM
Step9:          IF j≠0 Then Continue Else Goto Step 13
Step10:           Shift Right TGM by one bit and Assign the value in GM
Step11:     End IF
Step12: End If
Step13: Repeat through Step 4
Step14: Return
```

Corresponding Author: Saptarshi Naskar*[1],
[1]Assistant Professor, Dept. of CS, Sarsuna College, (University of Calcutta), India.

EXPLANATION OF THIS ALGORITHM

This Algorithm generates **All possible gray codes sequentially up to *n* bits** ***(Problem1)***.

While generating these bit-sequences the intermediate array **PAT []** is nothing but the Palindrome number, that is this algorithm **generates Palindrome Number Sequences** ***(Problem 2)***.

Using this Algorithm after nominal modification intelligently it can generate the **Power Set *P(S)* of a given set *S(Problem 3)***.

This also leads to the solution of the problem of generation of **All Possible Combination of a set of numbers *(Problem 4)*** with minimal addition alteration over the algorithm intelligently.

Hence we call this Algorithm as Emotionally Intelligent Algorithm.

COMPUTATIONAL COMPLEXITY:

Let, number of vertices for the given graph ***G*** is ***V***, number of edges is ***E*** and the number of tree possible for the graph is **N**. Then the algorithm must output **N** number of trees. Now, to generate a single tree form the module **ALL_TREES**:

(i) To generate T_0 the required time complexity is of $\mathbf{O}(E\log(V) + V)$.

(ii) For the module **Gray_Code_Mat** $\mathbf{O}(V^2)$

(iii) For the module FCM time required is $\mathbf{O}(V^2)$

Since, in the limiting case **N** actually dominating factor over V^2 then over all time complexity for the proposed algorithm is $\mathbf{O}(E\log(V) + V + \mathbf{N})$.

Now the space complexity for the algorithm is only the space required to represent the single tree. And since, only single level trees are required to store then at most *V* rows are required. Hence the space required for this algorithm is $\mathbf{O}(V^2)$.

Since, **N** represents number of trees it may be exponential in the worst case. Obviously, the conclusion is trivial as we are generating all trees of any graph.

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