Pleasantness of Faculty Members: An Emotional Perception in Artificial Intelligence

Amarnath Singh[1], R. C. Tripathi[2]

[1]Research Scholar, Monad University, Hapur, India
[2]Professor, Monad University, Hapur, India
Email address: amarnath18ranchi@gmail.com

Abstract— Emotions are an integral part of the human beings and therefore, they cannot be turned on and off on a whim. However, this could be possible for the artificial agent. Emotions could not be a mechanism for enhancing intelligence and then isolating from other psychological and physiological functions. In this paper, we have analysed pleasantness from various respondents, the faculty members of different background, different locations, different experiences, different designations and different age groups and have observed their emotional aspects. This will be useful in emotionally motivated artificial intelligence.

Keywords— Emotional Perception, Pleasantness, Artificial Agent.

I. INTRODUCTION

The research and development activities on AI based systems show that deep learning modules of Al based systems lacks the emotional aspects of human intelligence. In order to fix the subjective issues like relationship, depression, anxiety and emotional issues, the future artificial intelligence based systems require deep emotional intelligence modules. AI is not only limited by deep learning algorithms, but also expanding its horizons in deeper levels of human consciousness. Modern AI is successful for many areas like pattern recognition, voice recognition, face identification and machine learning. But, in today's world, AI is more needed in dealing with emotions like anger, impatience, disappointment, frustration, surprise, happiness, and gratitude [1].

Humans sense their environment with several senses for detecting external stimuli and others for tracking their internal states (e.g. hunger). Artificial agents must also implement a number of mechanisms that track not only their external environment but also their internal states in order to interact intelligently with their environment and other agents [2].

There are several kinds of agents proposed and studied widely. Some of them are listed below:

- Agents sensing human emotional states [3]
- Agents producing outward emotional behaviour [4-5]
- Agents that are motivated by their emotions [6-7]
- Agents that internally represent emotional states for the purpose of goal setting and motivation [8-9]. These agents have mechanisms that perceive their environment and internal states for the purpose of calculating their emotions and producing appropriate behaviour.

This paper has attempted to strengthen the Emotionally Motivated Artificial Intelligence (EMAI) model whose sensory input is emotionally filtered before processing. The starting point is by examining the effect of emotion on perception in faculty members. An overview of the agent architecture includes details about the calculations used by an agent to determine emotional states. The factors of human perception are examined with respect to their emulation in the artificial agent. The re-visited model may be termed as Emotionally Dominated Artificial Intelligence (EDAI) model.

II. THE EMAI MODEL

The Emotionally Motivated Artificial Intelligence (EMAI) model is a complex set of mechanisms that process emotional concepts for their use in affective decision-making and reasoning [9].

There are two types of emotion mechanisms integrated in the EMAI model.

(1) *Motivational Drives*: These drives can be classified according to their source, pleasure rating and strength. These drives could be used to initiate behaviour in the agent. They usually include concepts such as hunger, fatigue or arousal etc. The strength of the drives is temporally dynamic and at particular threshold levels the agent will set goals, that when successfully achieved, will pacify the drives [10].

(2) *Secondary Emotion*: These emotions refer to the resultant mental as well as physical states generated by attempts to satisfy the goals. These emotions include feelings such as happiness, anger, sorrow, guilt and boredom and are represented in the architecture as values in the affective space (emotionally dominated space).

The affective space is a six-dimensional space defined by six appraisal dimensions. The affective space, based on the psychological model defines 15 emotions (happiness, sadness, anger, boredom, challenge, hope, fear, interest, contempt, disgust, frustration, surprise, pride, shame and guilt) with respect to the dimensions of pleasantness (P), responsibility (R), effort (E), certainty (C), attention (A) and control (O). We will discuss these emotions with pleasantness only.

III. EXPERIMENTS AND RESULTS

We conducted following experiments with 400 faculty members (80 % male and 20 % females). The distribution of the faculty members is given in table I. The interests and experience of these faculty members are different and therefore the experiments were chosen accordingly as mentioned below:

(1) You feel comfortable in teaching incorporating the examples

(2) You feel comfortable in teaching while incorporating the case studies

(3) You feel comfortable in teaching with the help of multiple choice questions

(4) You feel comfortable in teaching through assignments

(5) You feel comfortable in using OER

(6) You are comfortable with SWAYAM platform

Each of them was asked to rate their emotions on a 10-point scale (10 highest, 1 lowest). The pleasantness was then computed by using the following formula:

$$P = [\sum_{i=1}^{m} p_{si}]/m$$

where m is the number of times the agent has come in contact with the stimulus, s, and p_S is the pleasantness rating of s.

The results are given in tables II to IV and are graphically shown in Figs. 1-3 for Assistant Professors, Associate Professors and Professors respectively. The following conclusions can be drawn from these results:

Pleasantness for Assistant Professors: The pleasantness for Assistant Professors varies from 7.17 to 9.25. The highest value of P (9.25) was observed for N-M.

Pleasantness for Associate Professors: The pleasantness for Associate Professors varies from 7.17 to 9.0. The highest value of P (9.0) was observed for N-M.

Pleasantness for Professors: The pleasantness for Professors varies from 7.5 to 8.83. The highest value of P (8.83) was observed for N-M.

The values are lower for the female faculty members at all places considered. This seems to be surprising because female faculty members are serious teachers. The pleasantness is not uniform across different locations and hence human being. This is a challenge for AI in sensing the human emotions and for designing e-learning.
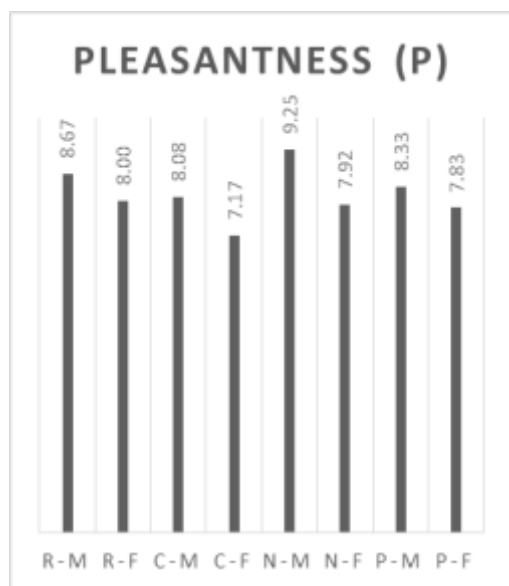

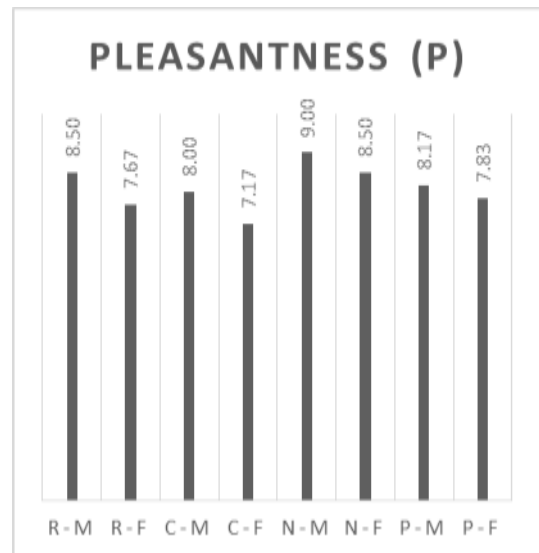Fig. 2. Variation of pleasantness of associate professors.
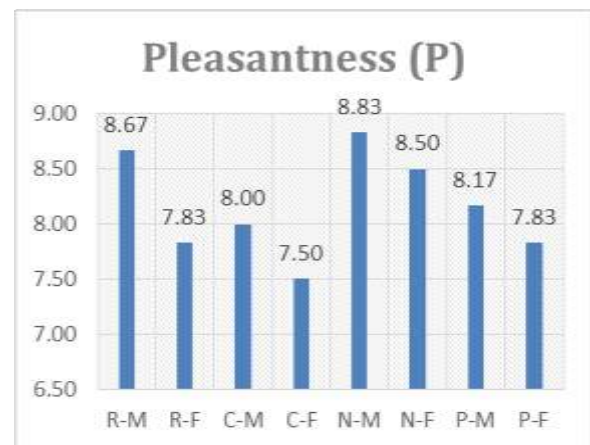

Fig. 3. Variation of pleasantness of professors.

Fig. 1. Variation of pleasantness of assistant professors.

TABLE I. Faculty members chosen for the experiments.

Faculty	Assistant Professor	Associate Professor	Professor	Total
Location	**Ranchi**			
Male (R-M)	60	30	10	100
Female (R-F)	10	5	5	20
Location	**Chennai**			
Male (C-M)	30	20	10	60
Female (C-F)	10	5	5	20
Location	**Noida**			
Male (N-M)	40	20	10	70
Female (N-F)	10	5	5	20
Location	**Patna**			
Male (P-M)	50	30	10	90
Female (P-F)	10	5	5	20

TABLE II. Pleasantness for assistant professors.

Exp. No.	Assistant Professors							
	R-M	R-F	C-M	C-F	N-M	N-F	P-M	P-F
1	8.5	8	8	8	9	8	8.5	8
2	9	8	8.5	8	8.5	7.5	8	8
3	8.5	8	8	7	9	7	8.5	8
4	10	9	8	6	10	9	8	7
5	8	7.5	8	7	9.5	8	8.5	8
6	8	7.5	8	7	9.5	8	8.5	8
P	8.67	8.00	8.08	7.17	9.25	7.92	8.33	7.83

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TABLE III. Pleasantness for associate professors.

Exp. No.	Associate Professors							
	R-M	R-F	C-M	C-F	N-M	N-F	P-M	P-F
1	8	8	8	8	9	9	9	8
2	9	8	8	8	8	8	8	8
3	8	8	8	7	9	8	8	8
4	10	8	8	6	10	10	8	7
5	8	7	8	7	9	8	8	8
6	8	7	8	7	9	8	8	8
P	8.50	7.67	8.00	7.17	9.00	8.50	8.17	7.83

TABLE IV. Pleasantness for professors.

Exp. No.	Professors							
	R-M	R-F	C-M	C-F	N-M	N-F	P-M	P-F
1	9	8	8	8	9	9	8	8
2	9	8	8	8	8	8	8	8
3	8	7	8	7	8	8	8	7
4	10	8	8	8	10	10	9	8
5	8	8	8	7	9	8	8	8
6	8	8	8	7	9	8	8	8
P	8.67	7.83	8.00	7.50	8.83	8.50	8.17	7.83

IV. CONCLUSIONS

We have analysed pleasantness of faculty members of different background, different locations, different experiences, different designations and different age groups and have observed their emotional aspects. The pleasantness

is not uniform across the places and hence different human being. This is a challenge for AI in sensing the human emotion

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