An Empirical Study on Students' Frustration Level Detection

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Abstract

Now-a-days growing interest in the development of computer systems which respond to users' affect. We report three small studies, which uses strategies derived from human–human interaction, can reduce user frustration within human–computer interaction. In this paper, we present a strategy to respond to students' different causes of frustration through by providing some questionaries. After analysing these questionaries, this study address the reason for frustration and reduce the frustration instances of student per session.

Keywords *-- Preprocessing, Clustering, Entropy, Fuzzy Classification, Decision Tree, Frustration Level.*

I. INTRODUCTION

To identify the frustration level of students proposed model uses the students behavior to unleash the same using Decision tree and Fuzzy classification theory which is powered with feature extraction model of NLP. Most of the time student often frustrated due to pressure of the educational process and long class hours. To maintain their enthusiasm up it always needs to motivate them in right direction.

II. TRANSACTIONS/JOURNAL PAPER PREPARATION

[1] Presents an automated detector that detects student frustration using coarse-grained data taken from protocols of the interaction between students and a programming environment. Using Weka, they generated a linear regression detector of average student frustration across five lab exercises. The detector made its prediction based on students' average number of consecutive compilations with the same edit location, average number of consecutive pairs with the same error, the average time between compilations, and average number of errors. This model predicted frustration significantly better than would be expected by chance, given the number of parameters in the model.

[2] Explored the development of real-time automated recognition of engagement from students' facial expressions. The motivating intuition was that teachers constantly evaluate the level of their students' engagement, and facial expressions play a key role in such evaluations. Thus, understanding and automating the process of how people judge student engagement from the face could have important applications. They used machine learning to develop automatic engagement detectors and found that for binary classification (e.g., high engagement versus low engagement), automated engagement detectors perform with comparable accuracy to humans. Finally, they show that both human and automatic engagement judgments correlate with task performance.

[3] Presents an innovative and effective pattern discovery
technique which includes the processes of pattern deploying and pattern evolving, to improve the effectiveness of using and updating discovered patterns for finding relevant and interesting information. Substantial experiments on RCV1 data collection and TREC topics demonstrate that the proposed solution achieves encouraging performance.

[4] Present attacked on single document summarization. Their algorithm is able to select sentences that human summarizers prefer to add to their summaries. Their algorithm relies on WordNet which is theoretically domain independent, and also they have used Wikipedia for some of the words that do not exist in the WordNet. For summarization, they aimed to use more cohesion clues than other lexical chain based summarization algorithms.

Their results were competitive with other summarization algorithms and achieved good results. Using co-occurrence of lexical chain members, their algorithm tries to build the bond between subject terms and the object terms in the text. With implicit segmentation, they tried to take advantage of lexical chains for text segmentation. It might be possible to use their algorithm as a text segmenter.

[5] Presents the explains and implements the most important text summarization strategies found in the literature in the last ten years. Three different corpora were used to assess the techniques presented. They selected the five best results obtained with the different test sets, one would obtain a coincidence of four methods as being the best ones: Word Frequency (Alg 1), TF/IDF (Alg 2), Lexical Similarity (Alg 6), and Sentence Length (Alg 9). The strategy Text-Rank Score (Alg 16) was also chosen by as providing good results for two of the three data sets tested. The results provided using ROUGE for the quantitative assessment of summarizers was quite close to the ones obtained by the qualitative analysis.

[6] Presents an automatic student modeling approach for identifying affective states in LMSs. The proposed approach uses the behavior of students' while they are learning in order to gather hints about their affective states. Based on the gathered indications of behavior, affective states are calculated using a simple rule-based mechanism. The information about the students' behavior can be used as basis for providing course material that fits to students' affective states. The approach is proposed for LMSs in general rather than for one specific system.

[7] Presents study was to separate students with high causal attributions and low causal attributions of mainstream and religious sectors and to find out the effect of these causal attributions on students 'subsequent academic achievement. Sample of the study was 490 students of grade X from Rawalpindi and Islamabad districts of Pakistan. Out of these 490 students 260 belonged to mainstream schools and 230 came from religious schools. The design of study was causal comparative. The statistical techniques of frequency distribution, mean, standard deviation, median, quartile deviations and t-test were used for analysis. The main conclusion drawn from the study was that there was significant difference between the academic achievement of intrinsically motivated students with high causal attributions and that of extrinsically motivated students with low causal attributions thus confirming Weiner's attribution theory.

[8] Author report on efforts in developing affective character-based interfaces, i.e., interfaces that recognize and measure affective information of the user and address user affect by employing embodied characters. In particular, they describe the Empathic Companion, an animated interface agent that accompanies the user in the setting of a virtual job interview. This interface application takes physiological data (skin conductance and electromyography) of a user in real-time, interprets them as emotions, and addresses the user's affective states in the form of empathic feedback. The Empathic Companion is conceived as an educational agent that support job seekers preparing for a job interview.

[9] Presented approaches for automatic recognition of engagement from students' facial expressions. They studied whether human observers can reliably judge engagement from the face; analyzed the signals observers use to make these judgments; and automated the process using machine learning. They used machine learning to develop automatic engagement detectors and found that for binary classification (e.g., high engagement versus low engagement), automated engagement detectors perform with comparable accuracy to humans. Finally, show that both human and automatic engagement judgments correlate with task performance

[10] Proposed a theory-driven approach to predict frustration of a student working with an ITS to understand the causes of frustration. The results of our approach are relatively equal compared to existing approaches. Our approach performs better in precision compared to other approaches of selecting features from the ITS log data. By using our frustration model, the cause of frustration is clearly seen, since we can infer which feature contributes more toward frustration. Since the cause of frustration is clear, it can lead to an informed adaptation in addressing frustration. Hence, we recommend our approach to those ITS developers, who are interested in not only detecting frustration but also in identifying its cause, thereby enabling them to perform an informed adaptation.

[11] Rule-Based Reasoning for Resource Recommendation in Personalized e-Learning that experimental results demonstrate that the proposed approach enables the resource recommendation to individual users, which is originated from multiple sources. The proposed approach designs ontology as a reference on to which concentrate on describing the learning style appropriate to each learner. The intend to improve the mediator ontology in order to support different educational systems and other systems.

III. CONCLUSION

Proposed systems efficiently do Scrutinization of data using preprocessing due to this data is segregated semantically rather than based on the attributes. Once the Data is segregated then their clusters are created to form more finite clusters. Finally proposed system identifies the frustration level identification using Fuzzy classification.

IV. Future Scope

We propose to develop system to create motivationa messges to respond to learner's affective states using, their previous knowledge, type, and duration of affective state.

V. REFERENCES

[1] Beverly Woolf,"Affect-aware tutors: recognising and responding to student affect",Int. J. Learning Technology, Vol. 4, Nos. 3/4, 2009.

[2] Cristina Conati,Heather Maclaren,"Empirically building and evaluating a probabilistic model of user affect", User Model User-Adap Inter (2009) 19:267–303DOI 10.1007/s11257-009-9062-8.

[3] Kate Hone, "Empathic agents to reduce user frustration: The effects of varying agent characteristics", interacting with Computers 18 (2006) 227-245.

[4] Ramkumar Rajendran, Sridhar Iyer, Sahana Murthy, Campbell Wilson, and Judithe Sheard," A Theory-Driven Approach to Predict Frustration in an ITS",IEEE TRANSACTIONS ON LEARNING TECHNOLOGIES, VOL. 6, NO. 4, OCTOBER-DECEMBER 2013.

[5] Ma. Mercedes T. Rodrigo, Ryan S.J.d. Baker, Jenilyn Agapito, Julieta Nabos, Ma. Concepcion Repalam, Salvador S. Reyes Jr and Maria Ofelia C.Z. San Pedro, "The Effects of an Interactive Software Agent on Student Affective Dynamics while Using an Intelligent Tutoring System", IEEE TRANSACTIONS ON AFFECTIVE COMPUTING, VOL. 3, NO. 2, APRIL-JUNE 2012.

[6] Farman Ali Khan, Sabine Graf, Edgar R. Weippl, A Min Tjoa," An Approach for Identifying Affective States through Behavioral Patterns in Web-based Learning Management Systems", Proceedings of iiWAS2009.

[7] Sadia Batool1, Muhammad Imran Yousuf 2* and QaisaraParveen," Study of Attribution Patterns among High and Low Attribution Groups: An Application of Weiner's Attribution Theory", The Anthropologist, 14:3, 193-197, DOI: 10.1080/09720073.2012.11891238.

[8] Helmut Prendinger ,Mitsuru Ishizuka," THE EMPATHIC COMPANION: A CHARACTER-BASED INTERFACE THAT ADDRESSES USERS' AFFECTIVE STATES", Applied Artificial Intelligence, 19:267–285 Copyright # 2005 Taylor & Francis Inc. ISSN: 0883-9514 print/1087-6545 online DOI: 10.1080/08839510590910174.

[9] Jacob Whitehill, ZewelanjiSerpell, Yi-Ching Lin, Aysha Foster, and Javier R. Movellan,"The Faces of Engagement: Automatic Recognition of Student Engagement from Facial Expressions",IEEE TRANSACTIONS ON AFFECTIVE COMPUTING, VOL. 5, NO. 1, JANUARY-MARCH 2014.

[10] Ramkumar Rajendran, Sridhar Iyer, Sahana Murthy, Campbell Wilson, and JuditheSheard," A Theory-Driven Approach to Predict Frustration in an ITS", IEEE transactions on learning technologies, VOL. 6, NO. 4, OCTOBER-DECEMBER 2013.