A Cognitively Based Approach to Affect Sensing from Text
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1. Research Purpose

1) Build Affective User Interface
Text-based Empathic Dialog System with Emotional Intelligence

2) Emotional Intelligence
a) Represent an ability to validly reason with emotions and to use emotions to enhance thought
b) Emotional Perception and Expression
the ability to accurately identify and express feelings

3) Emotion in Text or Linguistic Data
a) What emotions to recognise and How?
b) En-tag the emotion for communication

2. Our Focus

• Cognitive & Appraisal Structure of Emotion using OCC Model
• Classifying emotions into 22 types
• User Model based on LIWC and RDBMS

3. Methods

1) Chat Messages/Sentences Pre-Processing

a) Eliminate ‘non-emotional’ sentences
I. Questions
II. Clauses Phrases which begin with “when”, “after”, “before”, “if”

b) Sentence-level Processing. The following steps are performed:
I. Sentence Splitting
multiple-sentence text is split into single sentence
II. POS (part of speech) Tagging and Sentence Structure Recognition
III. Stemming words
Base form of verbs, adjectives etc

2) Applying Cognitive and Appraisal Structure of Emotion based on OCC Model

OCC Model specifies 22 emotion categories based on valenced reactions to situations constructed either as being goal relevant events, as acts of an accountable agent (including itself), or as attractive or unattractive objects.

Primarily we are considering six positive (joy, hope, relief, pride, gratitude and love) and six negative (distress, fear, disappointment, remorse, anger and hate) emotion categories.

3) Steps to fit linguistic information with the OCC Model

Classification tree to Evaluate for an event, action or object based emotion

4. Emotion Reasoning (examples)

happy-for( a, x, y, txt) <=> Valanced_Reaction(x,txt) ∧ Event_Consequence(y,txt) ∧ Positive_Polarity(a) ∧ (x <= 0 ∧ txt.Desire_For(a, y))

"Suzan bought a lottery ticket last week, she was very lucky to win the lottery"

Agent: Suzan (x)
Event: Buy (y)
Adjective: lucky (txt)
Object/Entity: Lottery ticket (txt)
Conditionality: true

I am wondering if I could buy a new car

Agent: I (x)
Event: Want (y)
Adjective: new (txt)
Object/Entity: New car (txt)
Conditionality: true

The employee, suspecting he was no longer needed, fired

Agent: I (x)
Event: Suspect (y)
Adjective: new (txt)
Conditionality: true

Sample Conversation:

Conversation with ALICE Chatbot:
Human: Oh, I am fine now but last night I had a bad dream
Really. Do you still have a bad dream?
Human: Not really, last night I was falling from a mountain in the dream
Computer: Oh really? Really. Where were you falling from a mountain in the dream? I have been missing you
Human: That was not real but it was really scary though
Computer: Oh give me an example of real but it was really scary

Expected affective conversation:
Human: Cool! But last night I had a bad dream.
Computer: Ahh! Was that scary?
Human: Not really
Computer: Then, why are you afraid of?
Human: I was in a kind of afraid of falling from a mountain!
Computer: Wow, Do you have such bad dream often?
Human: Not that often

5. Summary

This paper presents an Emotion Recognition from textual interaction based on cognitive and appraisal structure of emotions

• Syntactical sentence-level processing to fit OCC model is proposed
• Our approach is based on the collection of lexicon and simple rules to deal with sentence-level processing and assessing the valenced reactions to events, agents or objects described in the texts.
• Affective state awareness and affective machine reply will improve the interaction and usability of any system.