The W3C Emotion Markup Language Incubator Group

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towards a standard representation of emotion and affect in technological systems

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Outline

- Aims of the W3C Emotion Markup Language XG
  - Members
  - Target audience
- Work so far
  - Use cases
  - Requirements
  - Prioritised requirements
- Ongoing work
  - Write first spec draft
  - Get feedback
- Future
  - Continue in Recommendation Track?

W3C EmotionML Incubator Group: Aims

- Original XG (2006-2007):
  - "...to investigate the prospects of defining a general-purpose Emotion annotation and representation language..."
  - "...which should be usable in a large variety of technological contexts where emotions need to be represented."
- Current XG (Nov. 2007 – Nov. 2008):
  - prioritise the requirements;
  - formulate a specification draft;
  - illustrate how to combine the Emotion Markup Language with existing markup languages.

W3C EmotionML Incubator Group: Members

- W3C Members
  - DFKI
  - Loquendo
  - Deutsche Telekom
  - SRI International
  - NTUA
  - Fraunhofer
  - Chinese Acad. Science
- Invited Experts from
  - Emotion AI
  - U. Paris 8
  - U. Basque Country
  - U. C. Cork
  - OFAI, Austria
  - IPCA, Portugal

Target Audience

- Technology providers doing affective computing
  - affective reasoning
  - user behaviour analysis
  - generation of emotion-related behaviour
  - ...
- Data annotators
  - audio-visual records of expressive humans
  - text
  - faces
  - ...

Work so far (year 1): Use Cases

- Bottom-up process
- Total of 39 use cases grouped into three types:
  - Use case 1: Annotation of emotional data
  - Use case 2: Automatic recognition / classification of emotions
  - Use case 3: Generation of emotional system behavior

Work so far (year 1): Requirements

- Iterative process of distilling requirements from use cases
  - first within each of the three use cases
  - then, in combination
    - vocabulary issues
    - challenge to distinguish domain-specific from generic issues
  - several rounds of discussion and restructuring

  => scientifically meaningful but non-trivial collection in the Final Report of the first year:

  http://www.w3.org/2005/Incubator/emotion/XGR-emotion/

Requirements for an EmotionML

- Emotion core (9)
- Meta-information about emotion annotation (3)
- Links to the “rest of the world” (3)
- Global metadata (4)
- Ontologies of emotion descriptions (2)

Work so far (year 2): Prioritised Requirements

- Distinguish mandatory from optional requirements
  - Expert questionnaire
  - Two clear groups, few borderline cases
- Report: Requirements with Priorities

http://www.w3.org/2005/Incubator/emotion/XGR-requirements/

Mandatory Elements of an EmotionML

- Emotion Core

Core 1. Type of emotion-related phenomenon
Core 2. Emotion categories
Core 3. Emotion dimensions
Core 4. Appraisals related to the emotion
Core 5. Action tendencies
Core 6. Multiple and/or complex emotions
Core 7. Emotion intensity
Core 8. Emotion timing

- Meta-information about emotion annotation

Meta 1. Confidence / probability
Meta 2. Modality

- Links to the “rest of the world”

Links 1. Links to media
Links 2. Position on a time line in externally linked objects
Links 3. The semantics of links to the "rest of the world"

- Global metadata

Global 0. A generic mechanism to represent global metadata

Optional Elements of an EmotionML

- Emotion Core

Core 9. Regulation

- Ontologies of emotion descriptions

Onto 1. Mappings between different emotion representations
Onto 2. Relationships between concepts in an emotion description

- Meta-information about emotion annotation

Meta 3. Acting

- Global metadata

Global 1. Info on Person(s)
Global 2. Social and communicative environment
Global 3. Purpose of classification
Global 4. Technical environment

Current state

Now we know what we need from a spec

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time to write it!

Ongoing work: Write a spec draft

- Question 1: How to “plug in” custom vocabulary?
  - no agreed set of emotion categories, dimensions, appraisals, or action tendencies

  => we need to propose a meaningful default set, but allow users to “plug in” their own vocabulary

- Question 2: XML, RDF or OWL?
  - tendency goes towards plain XML
  - RDF/OWL maybe for specific tasks?

- Question 3: How to ensure interoperability?
  - combine EmotionML with existing markup, e.g. EMMA or SSML

Current discussions 1: A possible solution to support “plug in” vocabulary in XML

- Base schema defines default vocabulary as one element in a **`substitutionGroup`**

```
<emotion>
  <BigSixCategory>surprise</BigSixCategory>
</emotion>
```

- Custom schema (in the same namespace) can **`xsd:include`** base schema, and define a new element in the same **`substitutionGroup`**

```
<emotion>
  <SubwayCategory>stressed</SubwayCategory>
</emotion>
```

Current discussions 2: How to represent scale values?

- Several language elements will need to be represented as scales
  - e.g., dimensions, appraisals, intensity, ...
- Simple solution would be [0,1] but:
  - users may want to use exaggerated values, e.g. for cartoons
  - human annotators usually use discrete labels
    - e.g., a Likert scale: “strongly disagree”, ..., “strongly agree”
    - discrete labels are ordinal, not metric
    - ordering may even be partial (A>B and B>C does not imply A>C)
    - annotation may be class specific: “very polite for a child”
- Need to weigh existing customs in certain communities against interoperability

Next steps

- Write a first spec draft within 2-3 months
- Invite feedback from MMI and VB groups
- Revised spec as “Final Incubator draft” by Nov. 08
- Decision on whether and how to continue in the Recommendation Track

Thank you for your attention!

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http://www.w3.org/2005/Incubator/emotion/