

Affective Computing

Intelligent User Interfaces

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Using notes from USC CSCI 534, Gratch & Marsella, 2006

Readings

- Gratch & Marsella, Lessons from Emotion Psychology for the Design of Lifelike Characters, AAI 2005
- D'Mello et al, Towards an Affect-Sensitive AutoTutor, IEEE Intelligent Sys. 2007

What is “Emotion” (“Affect”) ?

- **Cognitive** (*top-down*) *perspective*
 - appraisal of relationship between external events and internal beliefs desires and intentions
 - **Physiological** (*bottom-up*) *perspective*
 - neuroscience, medicine, etc.
 - **Social** (*outside-in*) *perspective*
 - perception/interaction with others
- => **computational models**

What is Emotion? (cont'd)

- Not even general agreement on **how many** emotions there are or how to characterize **dimensions**:
 - fear, anger, happiness, sadness, disgust, surprise
 - boredom, confusion, frustration ?

Emotion and Intelligence?

- Changing views of relation between “emotion” and “cognition”
 - used to be viewed as opposites
 - more recently seeing as complementary
 - cf. Minsky, *The Emotion Machine* book

How is Emotion Displayed?

- Multimodal
 - voice (content and intonation)
 - facial expression
 - gesture
 - posture
- Realistic vs. “cartoon” display
 - depends on your goals

How can Emotion be Detected?

- Multimodal
 - audio (content, stress)
 - cameras (visible, infrared)
 - physiological sensors (skin, etc.)

How can Emotion be Measured?

- Crucial question for scientific study
- Current state of the art is human judges
- No standard scales

Applications

- Types of systems:
 - embodied conversational agents
 - robots
 - user interfaces in general
- Domains
 - tutoring, training
 - entertainment

Readings

- Gratch & Marsella, Lessons from Emotion Psychology for the Design of Lifelike Characters, AAI 2005
 - survey paper
 - detailed examination of theoretical foundations
- D'Mello et al, Towards an Affect-Sensitive AutoTutor, IEEE Intelligent Sys. 2007
 - focused on tutoring application domain
 - careful user studies