

Affective Computing

Intelligent User Interfaces

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

CS 525U (S 09)

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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

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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



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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?

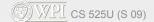
- Changing views of relation between "emotion" and "cognition"
 - · used to be viewed as opposites
 - · more recently seeing as complementary
 - cf. Minsky, The Emotion Machine book



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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.)



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How can Emotion be Measured?

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

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Applications

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



С

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

