The Future of Emotion

Rosalind Picard

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What is the most common emotion that technology elicits?

Hint: This next video is a person alone in his office trying to fill out a web form.
We didn’t tell him we used “impossible” captchas
AU6 cheek raise
AU12 lip corner puller
Machine recognition of real-world spontaneous emotion is VERY HARD

<table>
<thead>
<tr>
<th>Method</th>
<th>Acted Data</th>
<th>Spontaneous Data</th>
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<tbody>
<tr>
<td>BayesNet</td>
<td>90%</td>
<td>30%</td>
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<tr>
<td>AdaBoost</td>
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<td>Multilayer Perceptron</td>
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<td>SVM</td>
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<td>Random Forest</td>
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New: Machine learning (w/dynamics and more), the computer can now recognize both delight and frustration smiles. Hoque, McDuff, Picard (2012) IEEE T. Affective Computing, to appear
Face value: smiles

McDuff, el Kaliouby, Picard, MIT Media Lab and Affectiva
(try it live at forbes.com “Interactive Smile” or at affectiva.com)
A million in Tahrir square is a minority. In the future 80 million Egyptians can opt in to send their “nonverbal voice”
What about emotions “inside” that are not usually readable on the outside?

Autism:
1 in 88 children
1 in 54 boys
Emotion: Two main dimensions

- Arousal
- Skin conductance

- Valence
- Facial expressions

MIT Media Lab
Electrodermal Activity (EDA) Sensors

Traditional

Media Lab Innovations

Affectiva Q™ Sensor

Full disclosure: co-founder, chairman, chief scientist
Sympathetic nervous system
Stimulation: “fight or flight”

AUTONOMIC NERVOUS SYSTEM

Parasympathetic nervous system
Inhibition: “rest and digest”

(Not shown: Enteric division)
Some people can’t tell you what they are feeling
(Hedman, Picard, Miller et al., Sensory Processing and Autism Disorders)
Once upon a time there was a UROP’er…

His little brother, on the autism spectrum, could not speak.
Estimated Deaths in the United States in 2010
Brain waves suppressed after seizure

Estimated Deaths in the United States in 2010

4:00 pm today: *Neurology*

Important new finding relating affect data sensed on the wrist to a potentially life-threatening event in the brain

Poh et al., (2012) *Neurology*
“Emotion is the fourth vital sign.”
- Peter Weinstock, MD PhD
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@rosalindpicard
@affectiva
http://affect.media.mit.edu/publications.php

Paintings by Amanda Baggs