

EMORE international multidisciplinary workshop on Emotion Recognition

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What is an «emotion»

Cognitive system input
+
emotional (limbic/CN) system input
=
decision output

BRAIN

situations

Cognitive system

Emotional system

Cognitive system

Emotional system

If there is a lion...



Cognitive system says: baby lion, maybe mother around.

Emotional system says: AAAWW! CUTE!! I would like to touch!

Decision system says: better to watch from far.

And what if...



Cognitive system says: lions running at me!

Emotional system says: **FEAR** of death! **RUN AWAY!**

Decision system says: **EMERGENCY!**

What emotions are

Emotions are something that get us to **act** in a particular way.

The “qualia” (feeling) is not needed to run, but it is needed to teach and **plan** for the future. It's the internal subjective component of sense of perception, arising from stimulation of the senses by phenomena.

Emotions in an AI perspective

- Primitives (**modular**)
- Fast (**approximate**)
- Executed automatically (**reactive**)
- Based on environment (**adaptive**)
- Temporary with learning (**evolutionary**)
- Can be **collective** and **contagious**

Affective Computing=emotions and:

- *feelings*
- *thoughts*
- *sentiments*
- *moods*

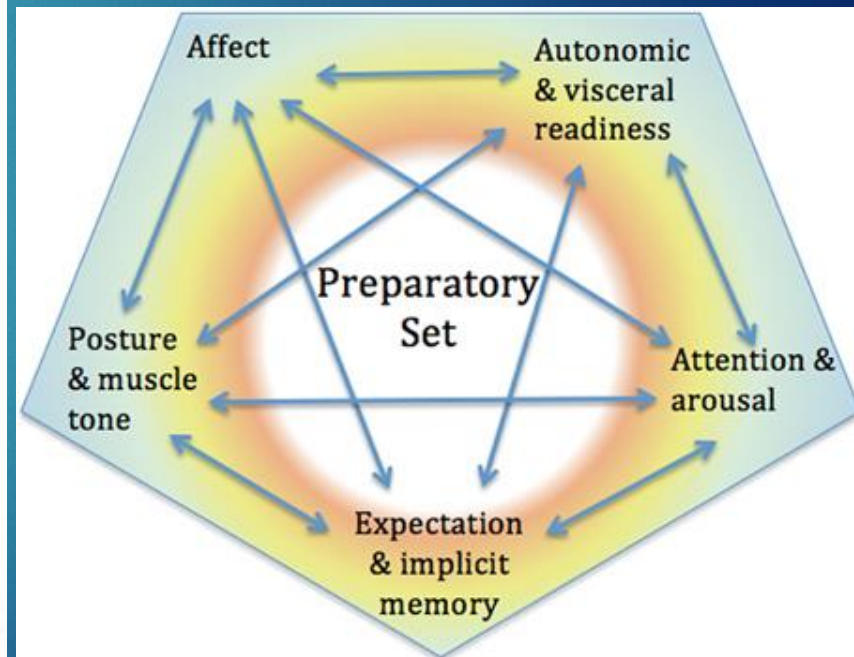
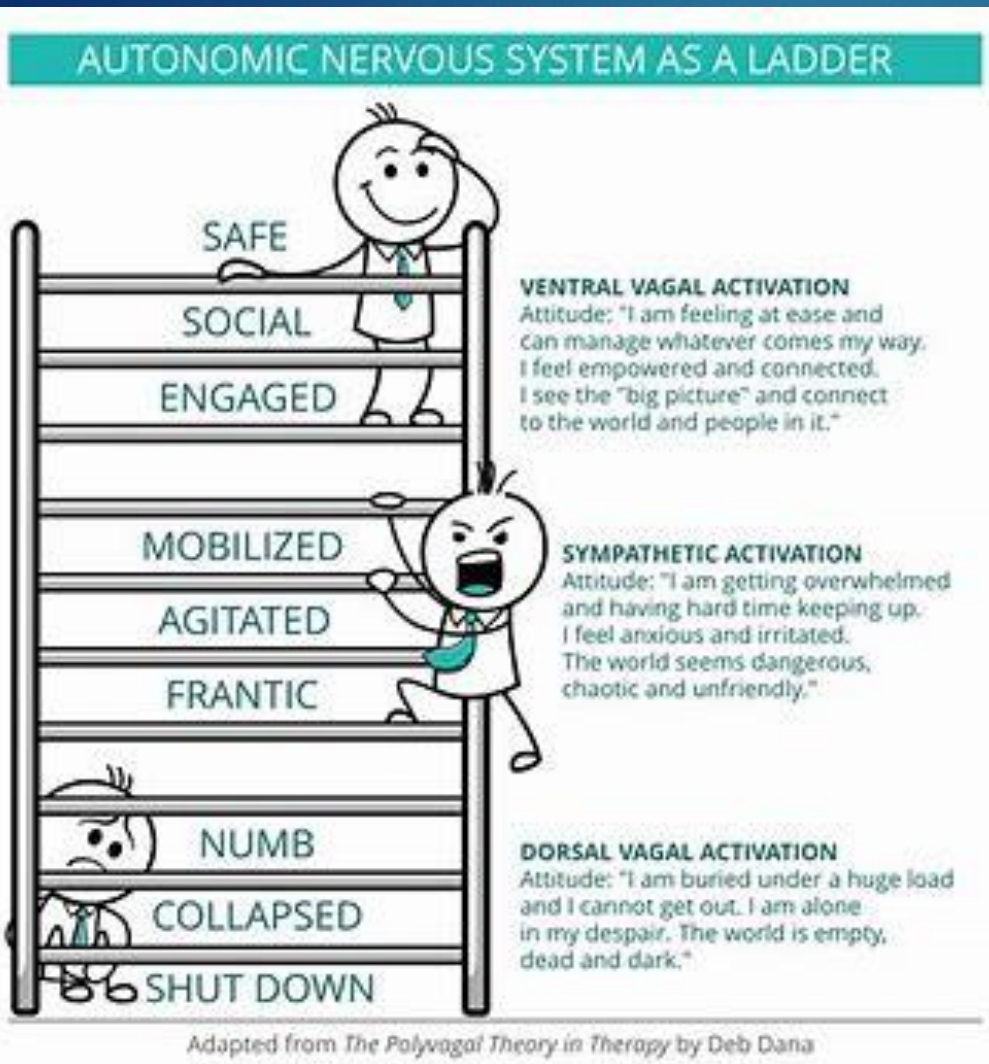
Emotions in Collaborative
Collective Computing
Relational

Emotions in Network Science
Communication Channel

Emotions in Multitasking and Process
Management
Bi-directional flow

Polyvagal Theory

Sensitive (input) and Active (output) nerve fibres from the Cranial Nerves to internal organs, skin and head.

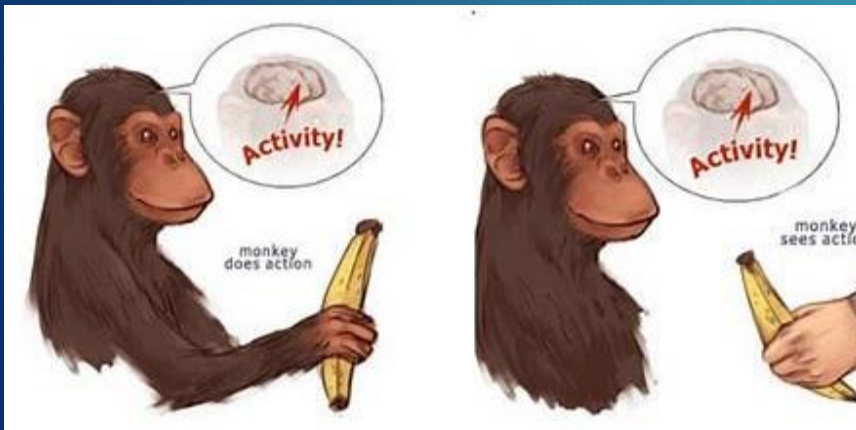


Mirror Neurons

We create millions of mirror neurons which mirror the neural actions and feelings of other people.

MediGraytion

TRUTHTOONS by Laura Graye



Implications

Response is similar for:

Performing the action

Witnessing the action

Hearing about the action

Mirror Neurons enable:

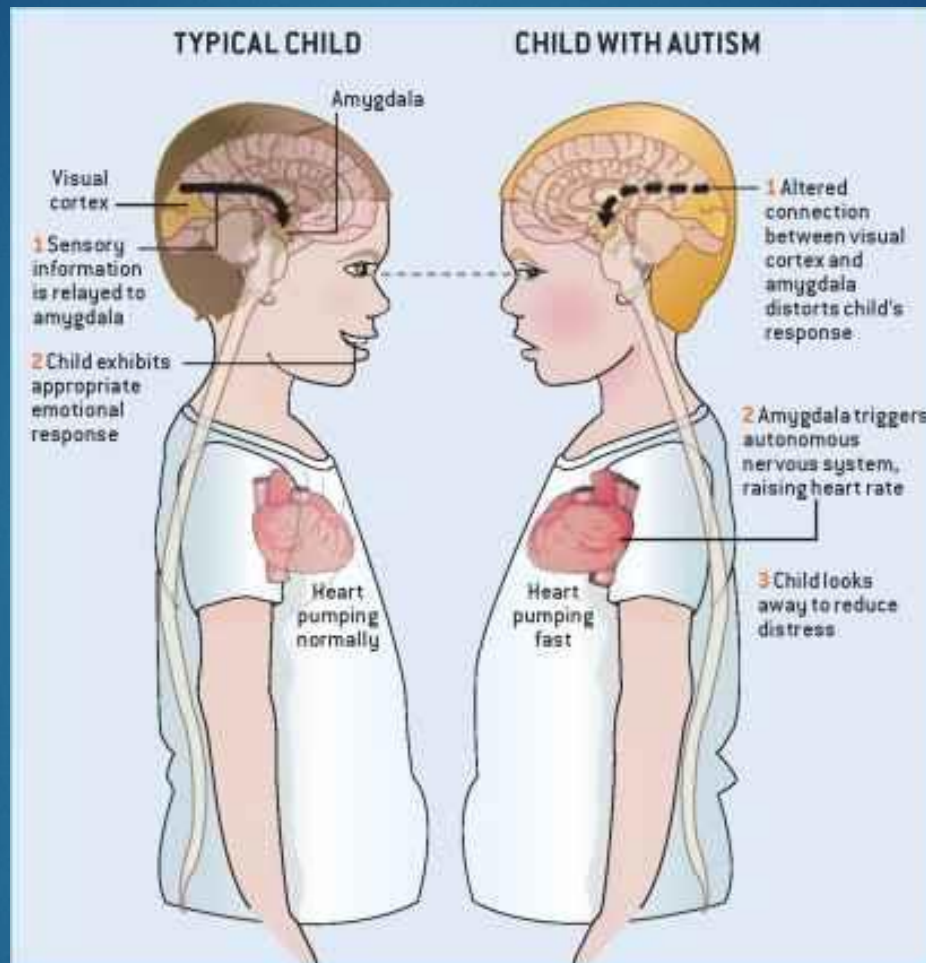
Empathy

Skill building through mimi

Vicarious experience



Challenges

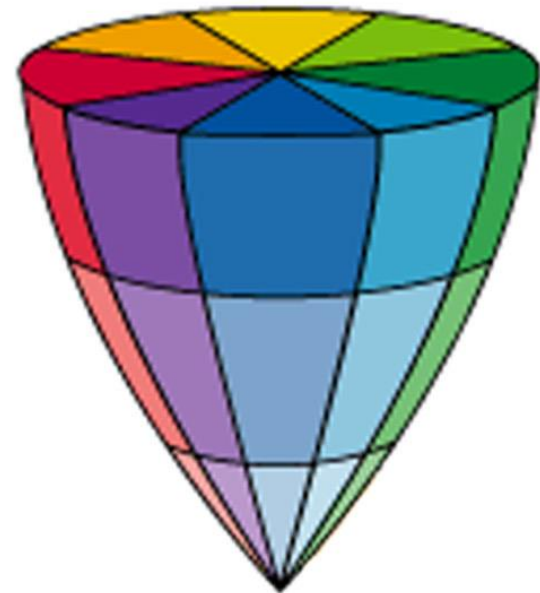
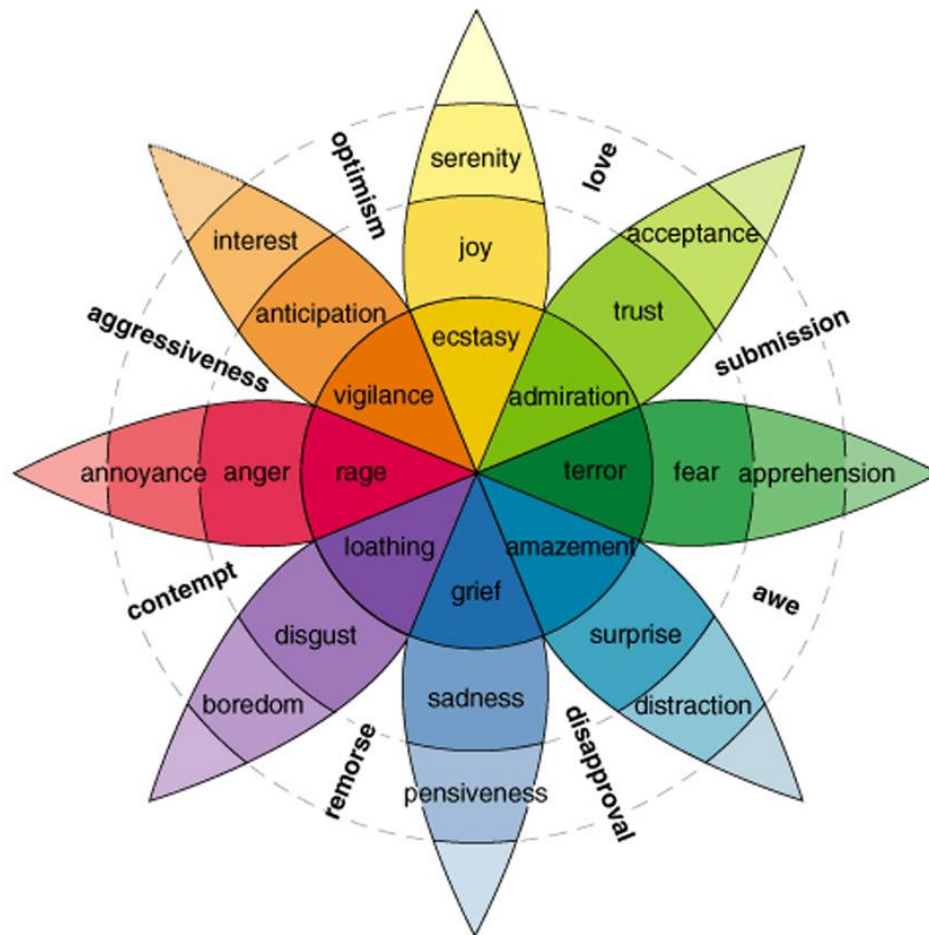


Assistive Systems for Emotion Recognition

O.Gervasi, V.Franzoni, M.Riganelli, S.Tasso: Automating facial emotion recognition. *Web Intell.* 17(1): 17-27 (2019)

V.Franzoni, G.Biondi, D.Perri, O.Gervasi: Enhancing Mouth-Based Emotion Recognition Using Transfer Learning. *Sensors* 20(18): 5222 (2020)

Challenges

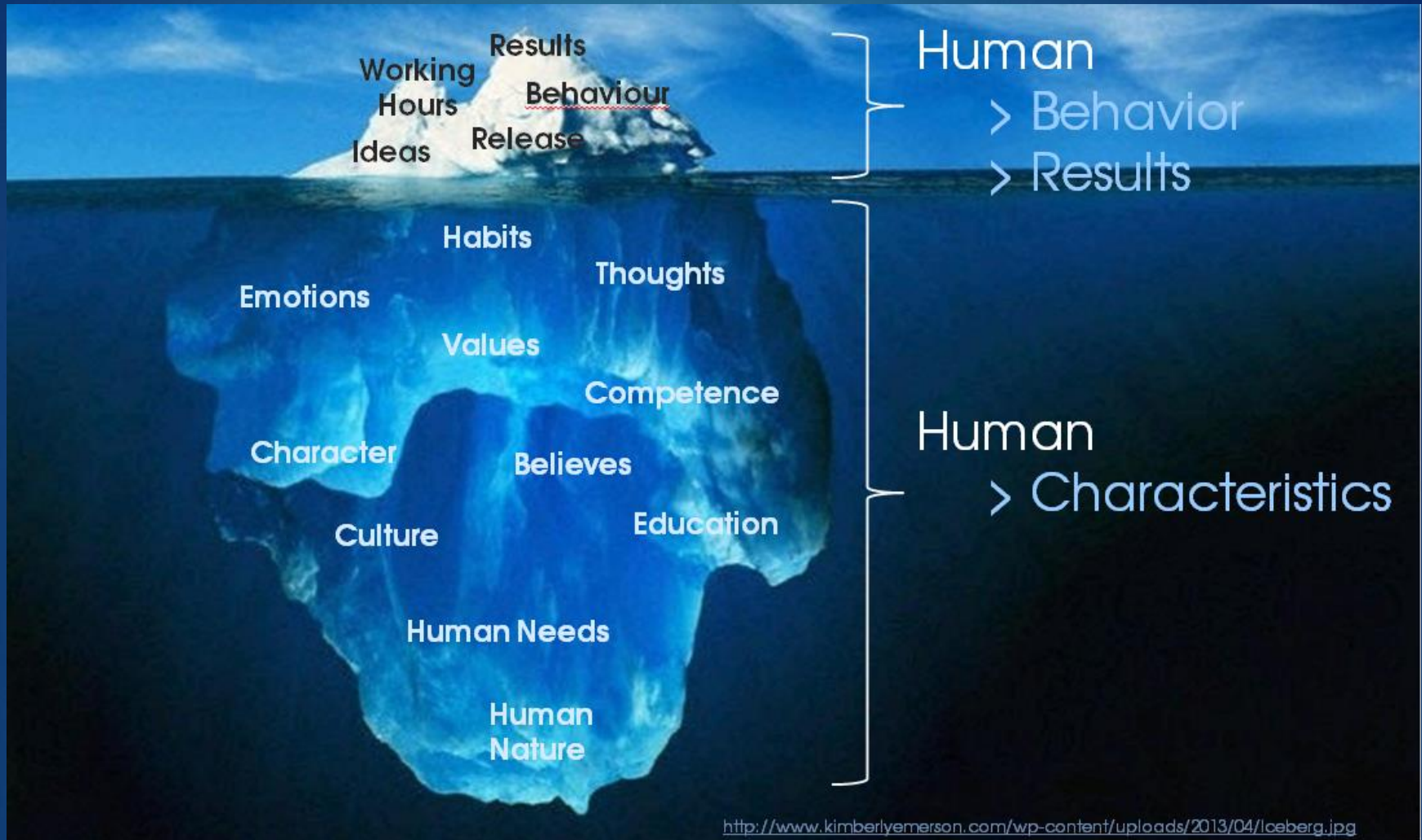


The Plutchik Emotion Circumplex
2D (left) and 3D (above) developed in 1980
by Robert Plutchik.

Multidimensional Models

V.Franzoni, J.Vallverdú, A.Milani: *Errors, Biases and Overconfidence in Artificial Emotional Modeling*. WI (Companion) 2019: 86-90

Challenges



Emotional Affordances and Complex Models

V.Franzoni, A.Milani, J.Vallverdú: *Emotional affordances in human-machine interactive planning and negotiation*. WI 2017: 924-930

Challenges



Non-Violent Communication

V.Franzoni, A.Milani: Emotion Recognition for Self-aid in Addiction Treatment, Psychotherapy, and Nonviolent Communication. ICCSA (2) 2019: 391-404

Challenges



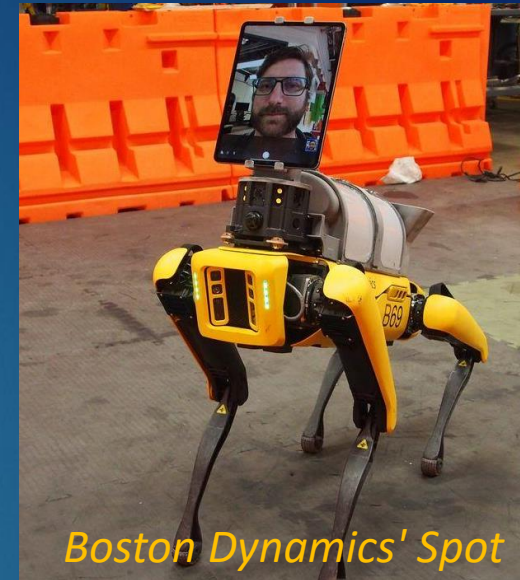
Crowd Emotion Recognition

V.Franzoni, G.Biondi, A.Milani: Emotional sounds of crowds: spectrogram-based analysis using deep learning. *Multim. Tools Appl.* 79(47): 36063-36075 (2020)



Social Robots

V.Franzoni, A.Milani, D.Nardi, J.Vallverdú: Emotional machines: The next revolution. *Web Intell.* 17(1): 1-7 (2019)



Boston Dynamics' Spot



Pandemics management

V.Franzoni, G.Biondi, A.Milani: Exploring Negative Emotions to Preserve Social Distance in a Pandemic Emergency. *ICCSA* (2) 2020: 562-573

EMORE program

- 14.00-14.15 Presentation of the workshop
- 14.15-14.40 S08205, *Towards Learning a Joint Representation from Transformer in Multimodal Emotion Recognition and feedback*
- 14.40-15.05 S08204, *Sentiment analysis model based on the word structural representation and feedback*
- 15.05-15.30 S08203, *Emojis Pictogram Classification for Semantic Recognition of Emotional Context and feedback*
- 15.30-15.55 S08206, *Virtual Reality for Enhancement of Emotional Mindset and feedback*
- 15.55-16.00 Greetings

[Sensors | Special Issue : Multimodal Emotion Recognition in Artificial Intelligence \(mdpi.com\)](#)

References links

International multidisciplinary workshop on Emotion Recognition

EMORE@BI2021, Padova, Italy 18 Sep 2021

<http://www.dmi.unipg.it/emore>

ACER@WI2021, Melbourne, Australia 14-17 Dec 2021

<http://www.dmi.unipg.it/acer>

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