



CSCI 680

Affective Computing

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Disclaimer: Some images used in this slide are AI-generated.



“Let me write the
songs of a nation;
I don’t care who
writes its laws”

— ANDREW FLETCHER



Thinking v. Feeling as Opposites

More info [here](#).

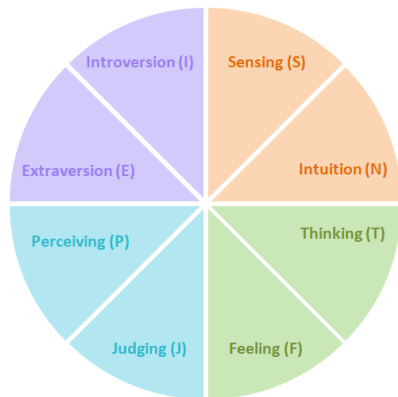
What are the Myers-Briggs Personality Types?

Social Interaction Style

This dimension measures where individuals derive their energy from. Extraverts gain energy from external interactions and activities, while introverts recharge through solitude and internal reflection.

Lifestyle and Work Approach

This scale measures lifestyle preferences. Judgers prefer structure, plans, and decisiveness, while perceivers enjoy flexibility, spontaneity, and keeping options open.

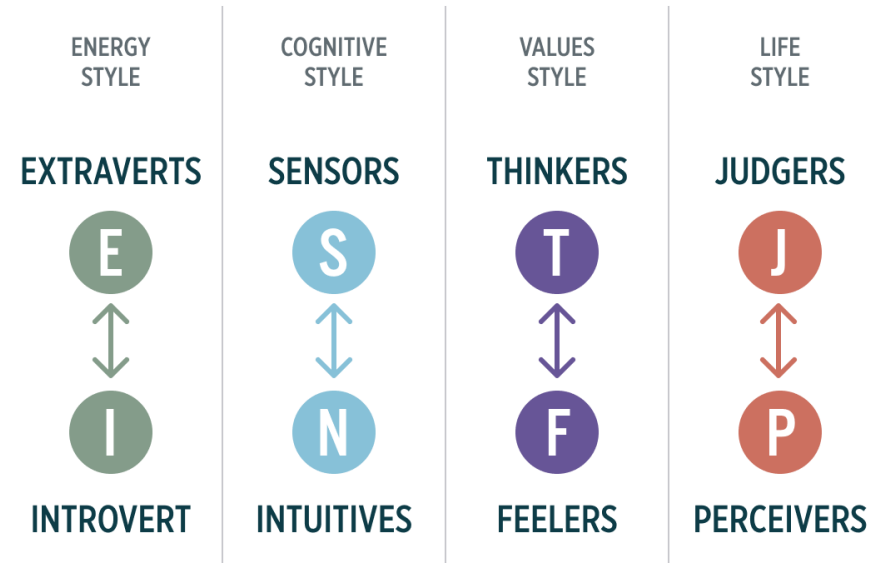


Information Processing Style

This scale assesses how people gather information. Sensors focus on concrete, present details and experiences, whereas intuitives look at patterns, possibilities, and future implications.

Decision-Making Style

This dimension evaluates decision-making processes. Thinkers base decisions on logic and objective analysis, while feelers prioritize personal values and the impact on others.

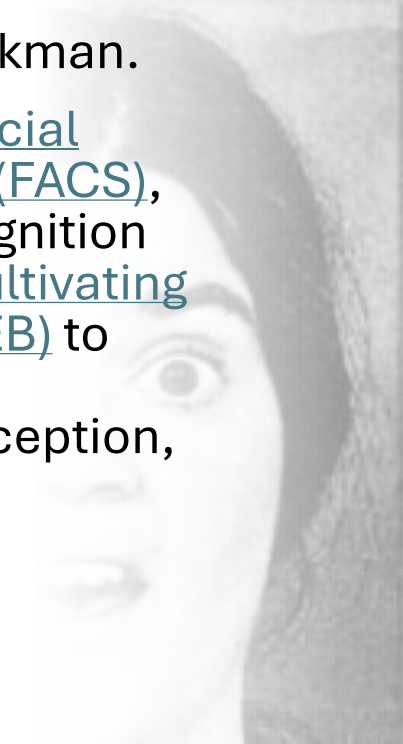
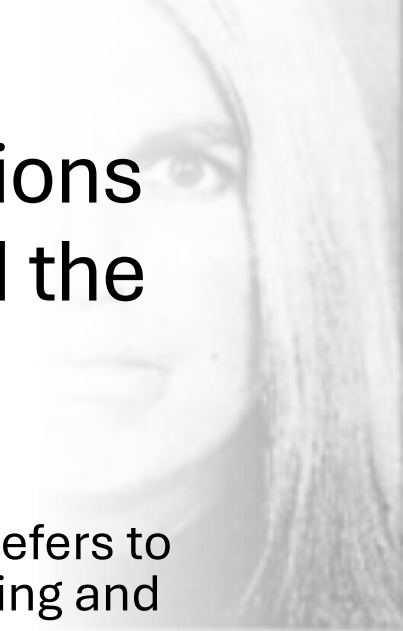


PERSONALITY TYPE

TRUITY.COM

Facial “Expressions of Emotion” and the Ekman Program

- The "Ekman Program" refers to the psychological training and research developed by pioneering emotion psychologist Dr. Paul Ekman.
- It encompasses the [Facial Action Coding System \(FACS\)](#), micro-expression recognition training ([METT](#)), and [Cultivating Emotional Balance \(CEB\)](#) to improve emotional intelligence, detect deception, and regulate moods.



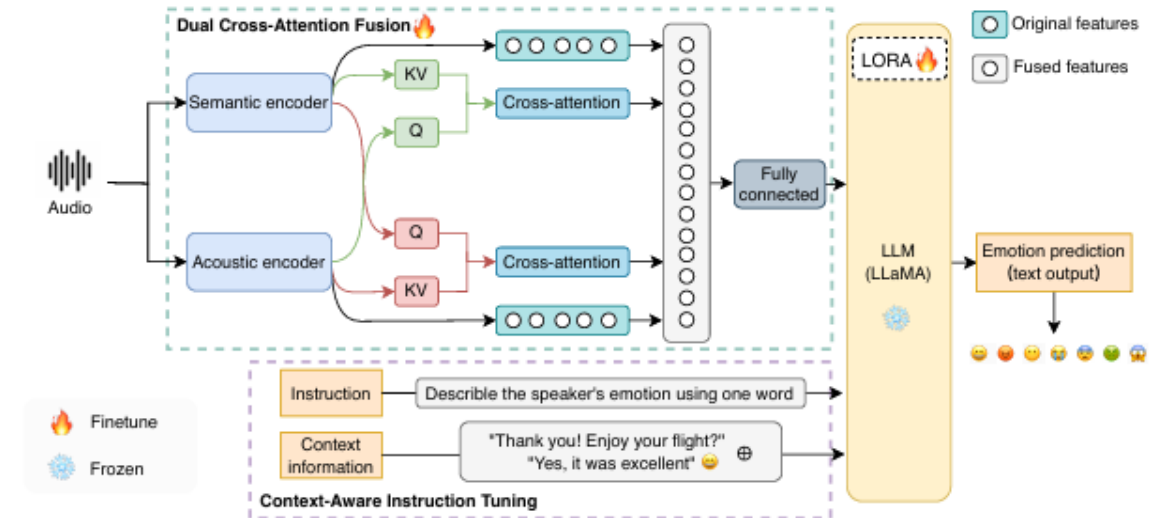
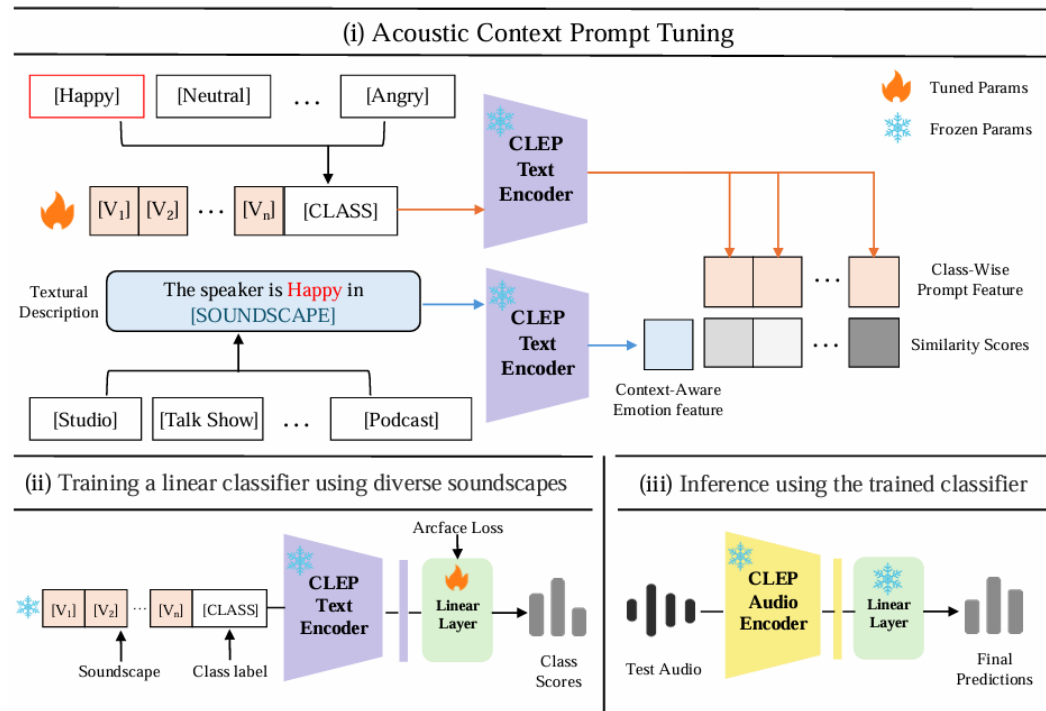
Affective Computing



- R. Picard 1997 book “Affective Computing”
 - This book proposes that we give computers the ability to recognize, express and in some cases “have” emotions. Is this not absurd?
- Now:
 - IEEE Transactions on Affective Computing
 - International Conference on Affective Computing and Intelligent Interaction (ACII) → <https://acii-conf.net/>
 - Increasing awareness that emotions play a significant role in human intelligence
 - Still don’t have “emotional machines” - why not?

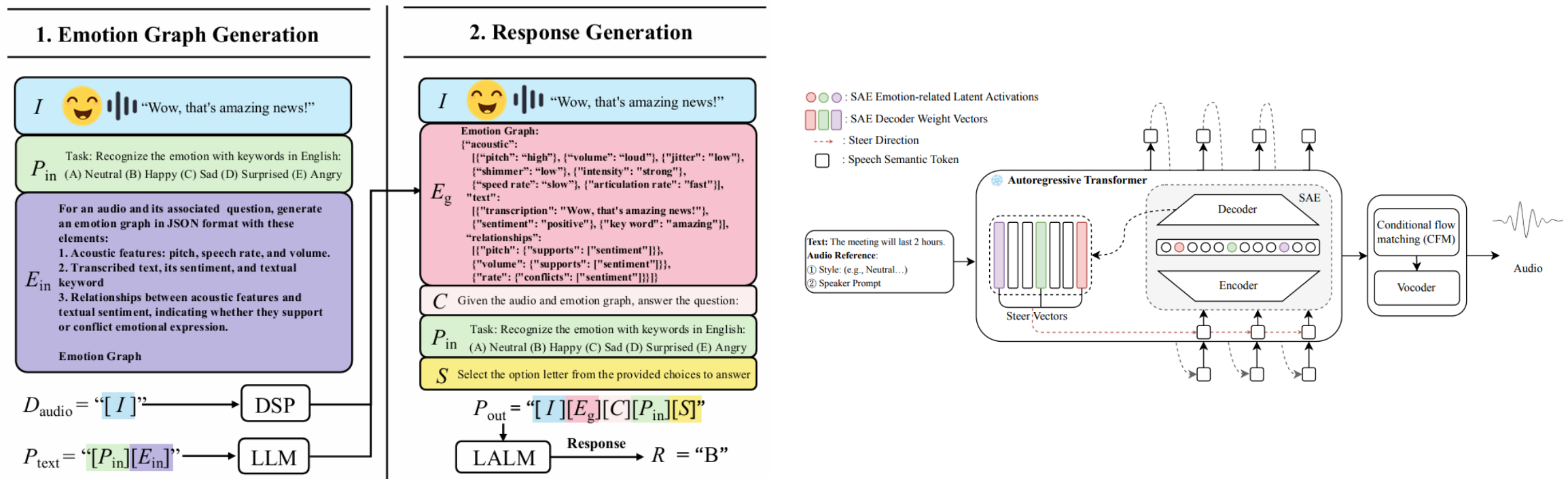
What Does It Mean for a Computer to “Recognize” Affect?

- Sample Topic: Emotion Recognition/Classification
- Challenges: distribution shifts among different speakers with different accents, from different cultural backgrounds, etc.



What Does It Mean for a Computer to “Express” Affect?

- Sample Topic: Emotion Text-To-Speech (TTS)
- Also seen in Generative AI in Computer Vision and Natural Language Processing



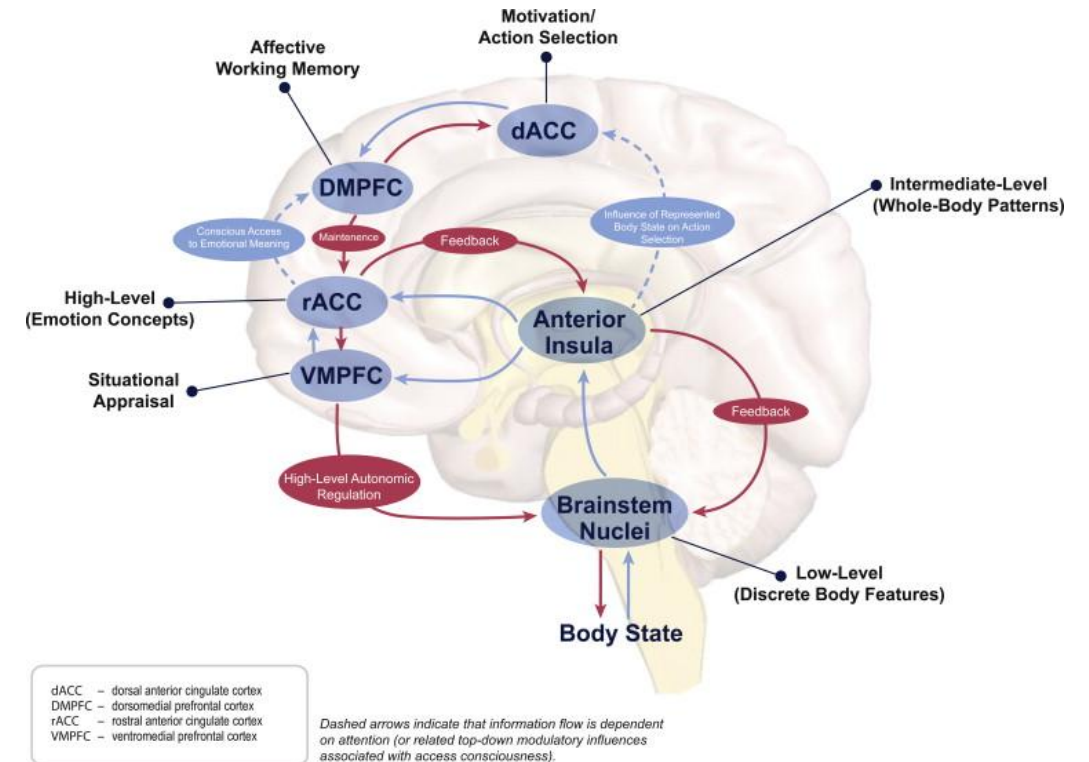
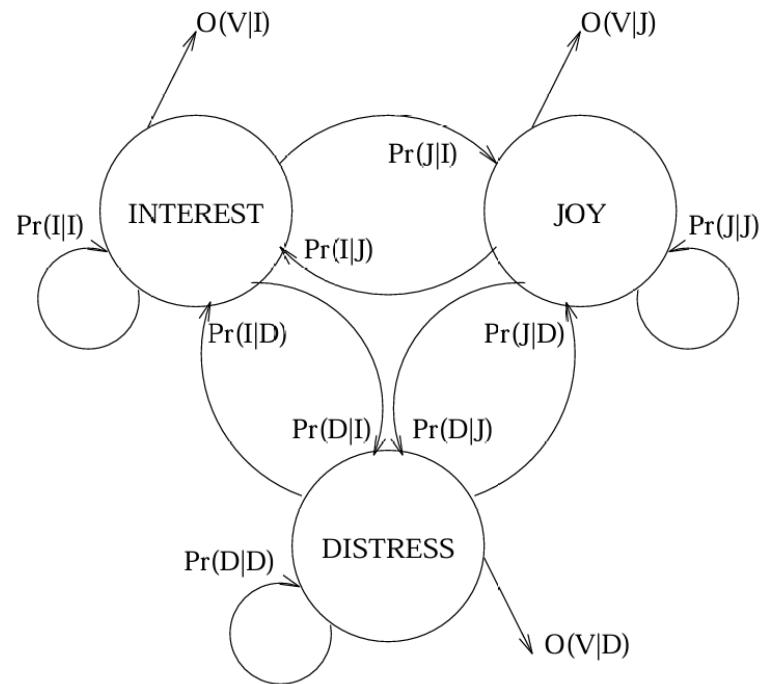
What Does It Mean for a Computer to “Have” Emotion?

See [*Pygmalion*](#) by Jean-Baptiste Regnault (1786).



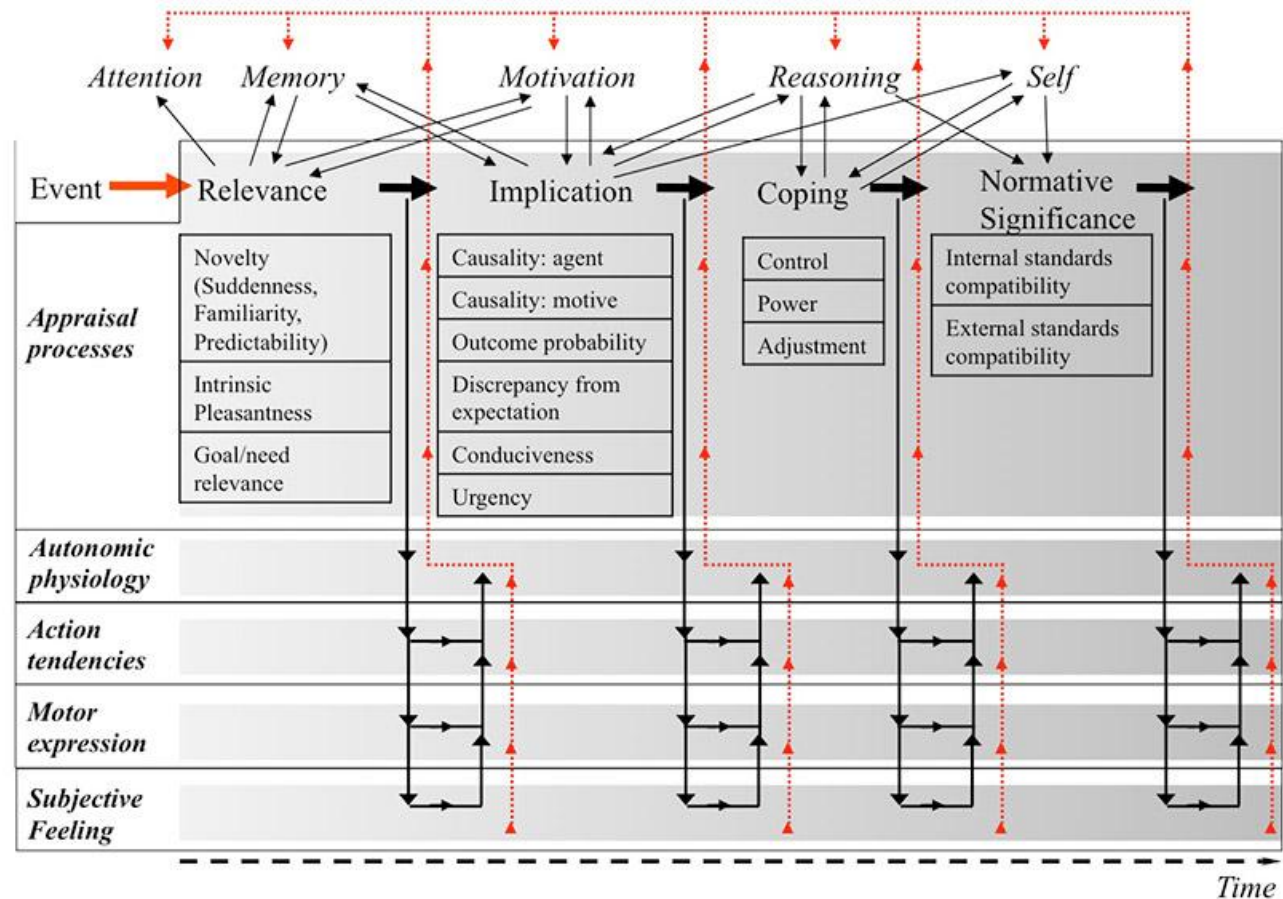
Emotion Is Not a Bug in Intelligence

Barry Kort: Learning is the quintessential emotional experience [5].

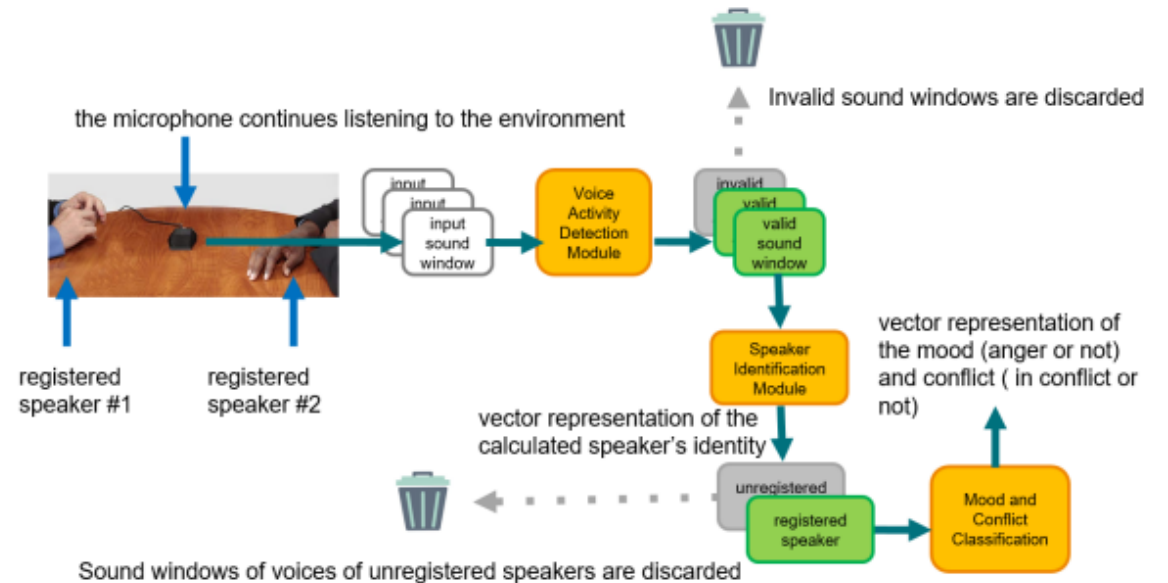
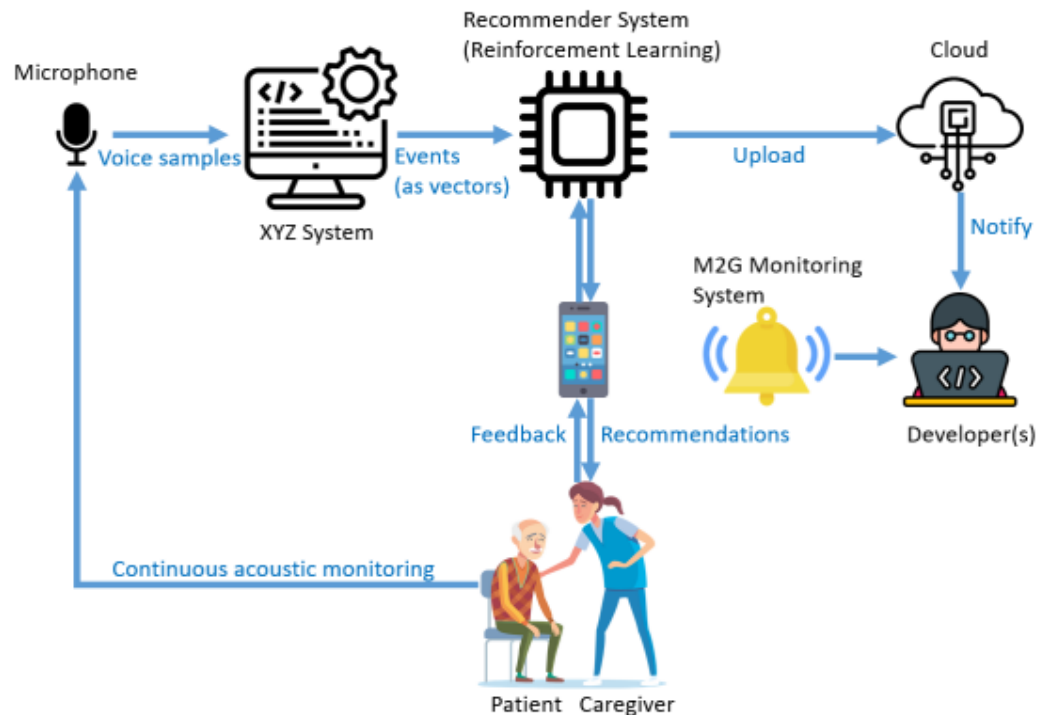


Emotion, Decision-Making, Learning, and Attention

- Comprehensive illustration of the Component Process Model.
- The model assumes that the appraisal process is organized in a sequence of four appraisal objectives.
- Each appraisal outcome leads to changes in the other emotion components (physiology, action tendency, motor expression, and subjective feeling, as illustrated by the descending arrows).
- The ongoing appraisal process furthermore interacts with other cognitive functions.



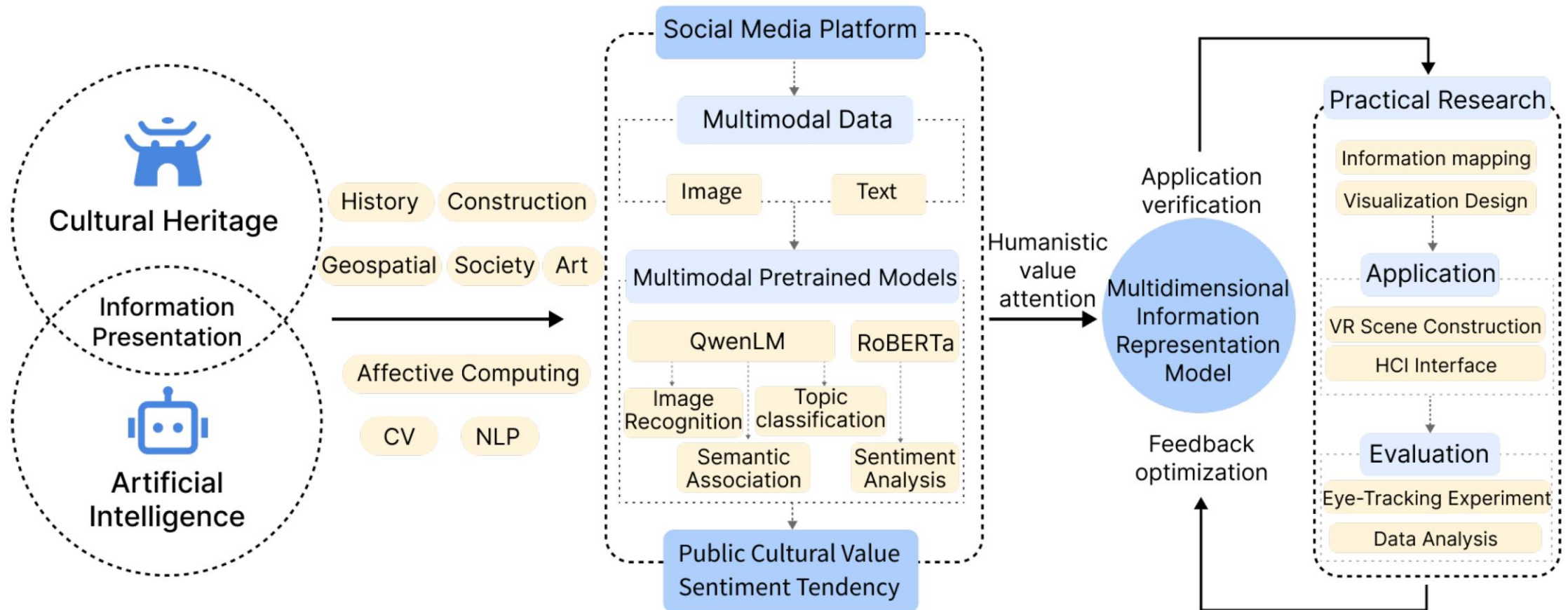
The Affective Loop: Sense, Infer, Respond, Adapt



Affective Computing Is Not Mind Reading



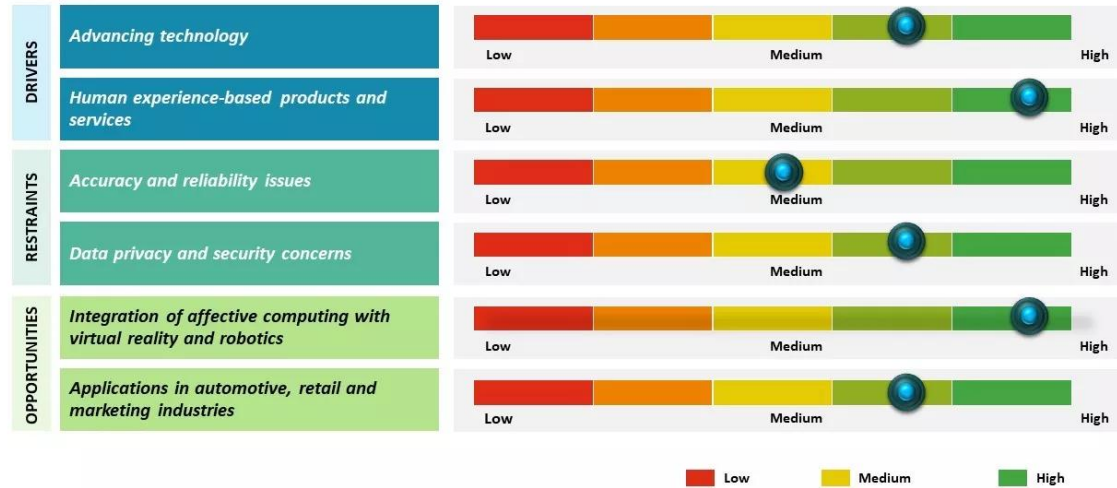
Where the Field Lives: AI, HCI, Psychology, Neuroscience



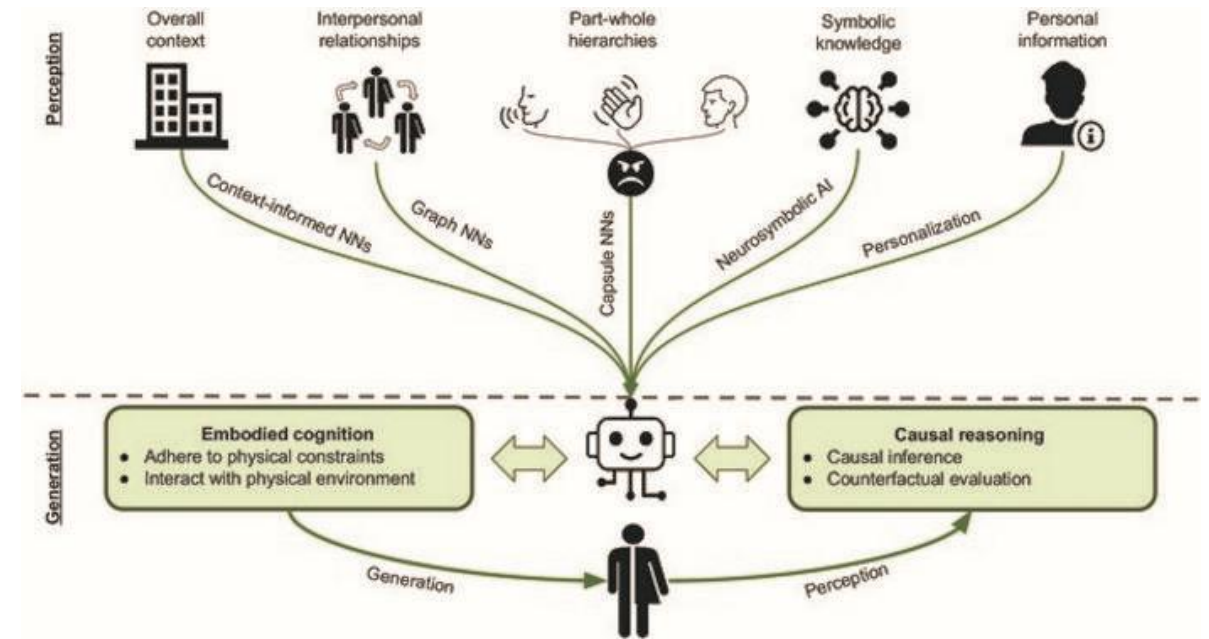
Impact Analysis of Key Factors

Global Affective Computing Market

COHERENT
MARKET INSIGHTS



Source: Primary Research, Desk Research, Paid subscriptions, CMI Data Repository



Applications: Health, Education, Entertainment, Social Interaction

1 CONTEXTUAL

The same expression can mean different things in different contexts.



Travel delay
(worry)



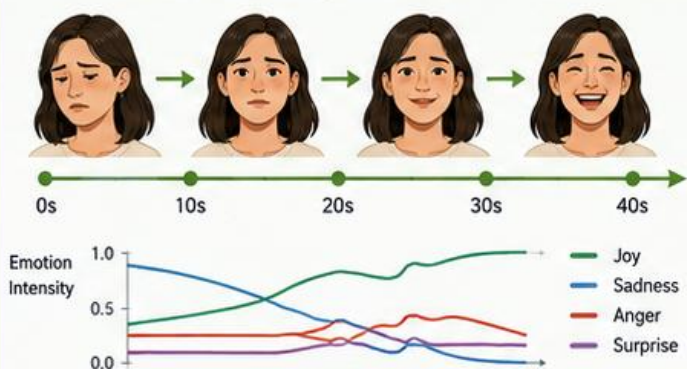
Performance review
(pressure)



First date
(nervous)

3 DYNAMIC

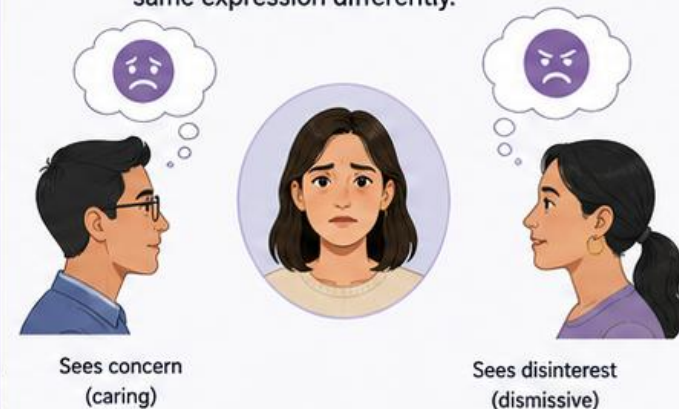
Emotions change over time.



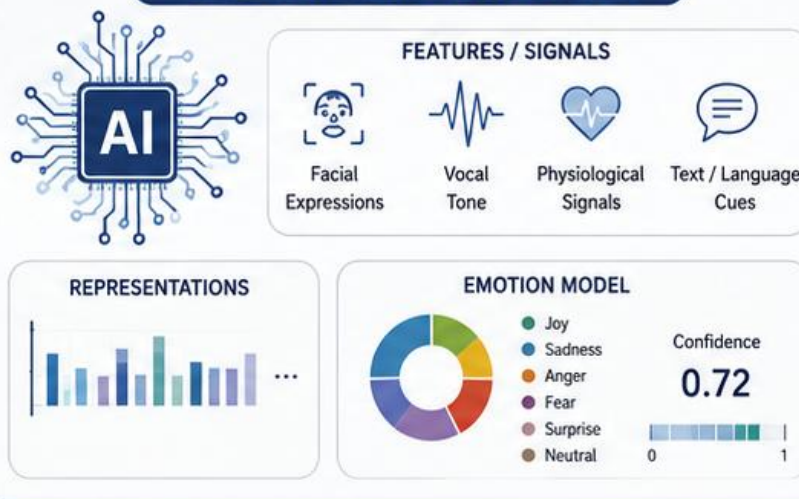
Affective computing needs to make emotion computationally tractable, but emotion is contextual, subjective, dynamic, and socially interpreted.

2 SUBJECTIVE

Different people can interpret the same expression differently.



AFFECTIVE COMPUTING SYSTEM



Computation seeks structure and certainty.
Emotion lives in complexity.

4 SOCIALLY INTERPRETED

Social norms, relationships, and culture shape emotional meaning.



Affective computing must bridge structured computation with the rich, complex nature of human emotion.

Discussion: Should Machines Be Emotion-Aware?

