

# Human-Emotion Sensing Technology

Discussion #3 - Neeraj

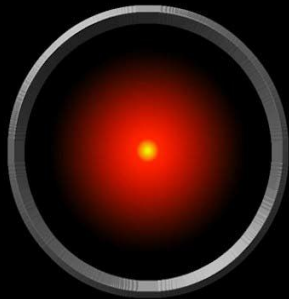
A dark blue diagonal gradient bar that starts from the bottom left corner and extends towards the top right corner, covering the lower half of the slide.

Send a thumbs up in the  
zoom chat if you have...

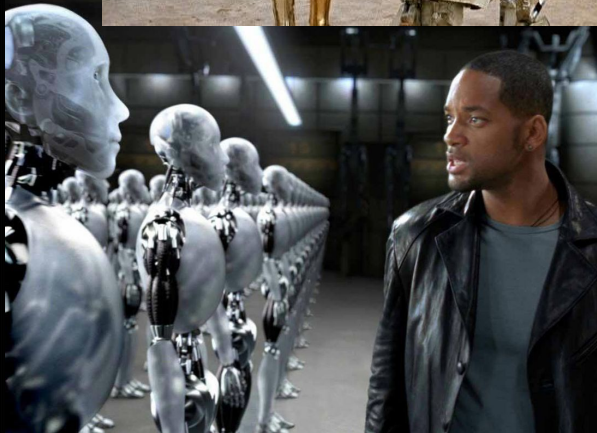
1. Seen a movie/read a  
book where a  
machine or a robot  
has emotions....



I'm sorry Dave,  
I'm afraid I can't do that.

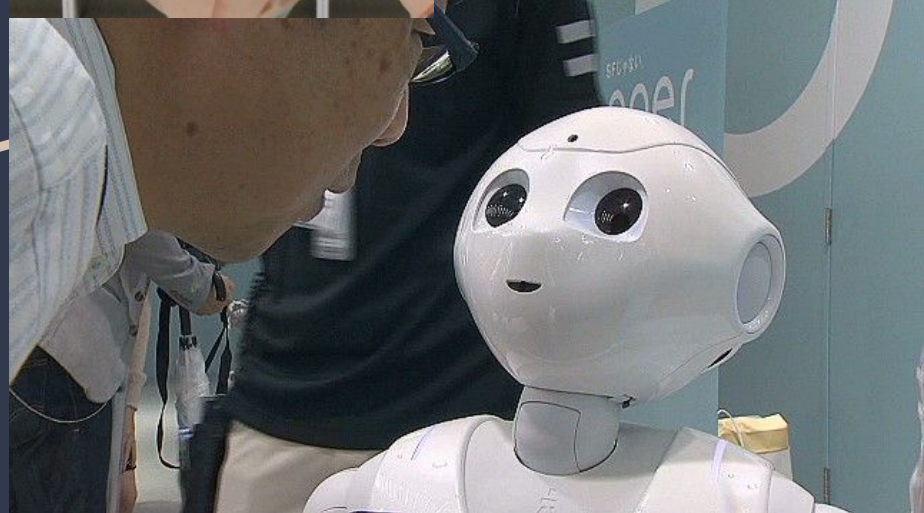
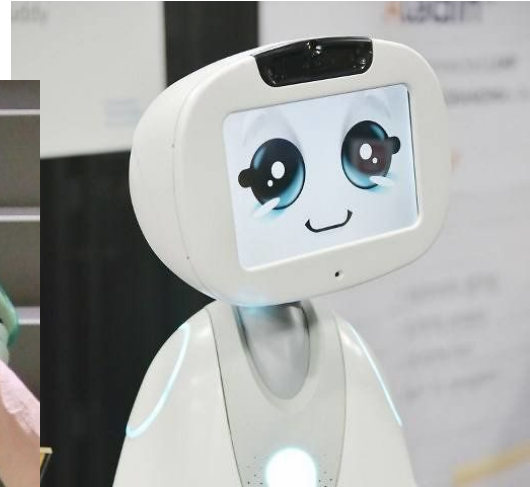
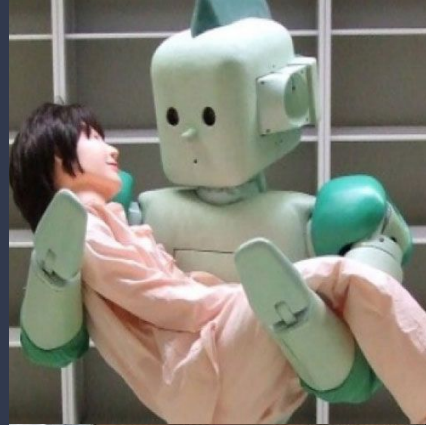


1968



Send a thumbs up if  
you have...

1. Seen in REAL LIFE  
a machine or  
Robot that has  
emotions...



# Framing Paper 1: “Affective Computing”

- Published 1995 in M.I.T Media Laboratory
- Book published in 1997 also called “Affective Computing”
- Primary Author: Rosalind W. Picard
  - Founder/Director of Affective Computing research group in MIT
  - Cofounder of the private company Affectiva (founded in 2016)
    - software company that builds AI that understands human emotions and cognitive states
    - Created a new category called AEI (Artificial Emotional Intelligence)
    - <https://www.affectiva.com/>



## Artificial Intelligence vs Artificial Emotional Intelligence:

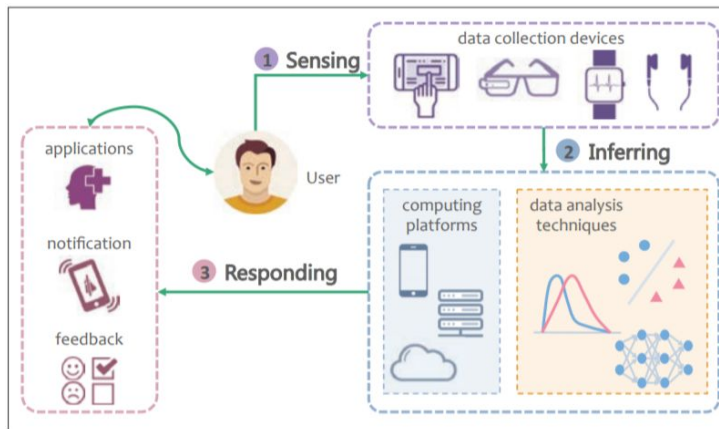
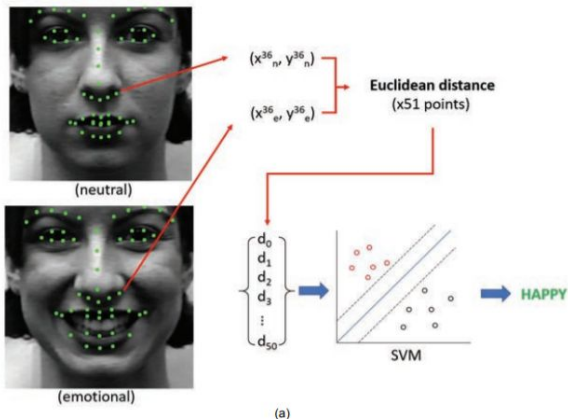
- Emotions are many times vital in decision-making
- “Wards off infinite logical search”

:) Affectiva

# Framing paper #2

## “Emotion Sensing for Mobile Computing”

- Published on 21 November 2019 in IEEE Communications Magazine
  - This article was the “monthly feature article” in IEEE for November
  - Describes upcoming and trending technology
- Authors: Jiayu Shu, Mangtik Chiu, and Pan Hui
  - Hong Kong University of Science and Technology



Pan Hui



# Recent Reading: n-Gage: Predicting in-class Emotional, Behavioural and Cognitive Engagement in the Wild

- Authors: Nan Gao, Wei Shao, Mohammad Saiedur Rahaman, Flora D. Salim
- Collaborated at RMIT University, Melbourne, Australia
- Published in "Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies" in September 2020 (PRETTY RECENT)
- Results: CO2 levels negatively impact student engagement, ST negatively correlated with mind-wandering, neg engagement = more physical movements...



Nan Gao



(a) Empatica E4 wristbands



(b) Netatmo indoor weather station



(c) Classroom for Year 10 students

# Discussion Question 1

**Is the concept of Affective Computing “better left unexplored”? Under what circumstances can it help humankind? Under what circumstances can it harm?**

“I would have assumed computers that show emotion can be driven by their emotion and turn into some sort of *Detroit: Become Human's* "Androids" style of robot” - Arthur

“Suppose we consider giving human emotions to a tablet instead of an autonomous robot. Do the same concerns (of a murderous robot) still stand?” - Jason

“This could be a great tool to improve interpersonal communication skills (...) It makes me wonder if anything like this has become advanced enough to use in in-home interventions for autism” - Colby

# Discussion Question 2

**Being able to discern emotions, as we read, requires a lot of data collection from individuals. What are the privacy implications that can come from this in a world where it's already getting pretty difficult to maintain privacy?**

“it potentially raises feelings of privacy being violated to be observed by the computer and not know what it is picking up from you, as well as the fact that knowing you are being “watched” may change your behavior” - Colby

“the mental health monitoring example and the user experience improvement one both suggest a passive sensing approach which might pose some potential harm towards how the data is collected and used. The role of trust in both conditions seems to be important” - Dennis



# Discussion Question 3

**How important is the role of emotion in Science? Does it take away from logic or do the two complement one another?**

“For a long time, in the history of science, people polarized thoughts and feelings, and marginalized the role of emotion in science. Picard brings us studies that show emotion as ‘a motivating and guiding force in perception and attention’, arguing that there is no such thing as ‘pure reason’ in our decision making process.” - Lika

“I couldn't agree more on the author's argument on the importance of emotion in rational decision-making for both humans and machines” - Jo

“Although science usually tends to reject the existence or rationality of emotions, the scientists themselves cannot avoid the feelings of emotions when they are doing science researches” - Myles

## FINALLY...

What apps/devices/features can you create with machines that can sense these emotions?

- Happiness
- Sadness
- Desire
- Disgust
- Boredom
- Fatigue
- Fear
- Surprise
- Anger

Applied to...

- Music
- Dating
- Food
- Gaming
- Therapy/Mental Health
- AND MORE