# Unlocking the Challenges in Emotion Recognition Systems through Artificial Intelligence

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### **Emotion recognition during daily life activities**

**Motivation & Research goals:** Technological advances have transformed how we address everyday problems, with AI playing a key role in fields like healthcare. This study introduces a wearable sensor system to monitor emotions during daily activities, shaping the research questions in this Ph.D. thesis.



Fig, 1: Graphical abstract of the system to monitor emotions during daily life activities presented in [1].

## **Challenge 1: Label ambiguity**

How does label ambiguity emerge in emotion recognition (ER) systems?

 $\rightarrow$  Normally, emotions are associated to data (labeled) based on self-reports or tasks (watching video-clip, public speaking, etc.)



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#### <u>RQ 1</u>: *How to reduce label ambiguity to detect affect?*

 $\rightarrow$  We propose learning through distributions to handle label ambiguity in ER systems [3].



## **Challenge 2: Affective priming**

What is it priming? A stimulus may impact the perception of subsequent events or stimuli.

# <u>RQ 2</u>: How to use label distributions to reduce the priming effect?

<u>RQ 2.1</u>: How does the order of stimuli impact the confusion of AI models?



Task order matters! as we showed in [2].

<u>RQ 2.2</u> : How can label distributions account	for the	priming effect?
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Public speaking (Fear)

MeditationWatching funny movie( Neutral)(Happy)

Meditation ( Neutral)



### References

- 1. Gutierrez Maestro E, De Almeida TR, Schaffernicht E, Martinez Mozos Ó. Wearable-Based Intelligent Emotion Monitoring in Older Adults during Daily Life Activities. Applied Sciences. 2023
- 2. E. G. Maestro, H. Banaee and A. Loutfi, "Stress Lingers: Recognizing the Impact of Task Order on Design of Stress and Emotion Detection Systems," 2023 IEEE EMBS Special Topic Conference on Data Science and Engineering in Healthcare, Medicine and Biology, Malta, 2023
- 3. E. G. Maestro, H. Banaee and A. Loutfi, "Towards Addressing Label Ambiguity in Sequential Emotional Responses Through Distribution Learning" In Proceedings of the Affective Computing and Intelligent Interaction: 12th International Conference, ACII 2024, Glasgow, United Kingdom

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