

A Systematic Review of Sender Contextual Information in Context-Aware Emotion Recognition (CAER) Systems

Author: Christo Vasilev
 Supervisor: Sayak Mukherjee
 Responsible Professor: Bernd Dudzik



1. Background

What are they feeling?



Figure 1: Emotionally Ambiguous Facial Expressions generated by Adobe Firefly

Recognizing emotions from facial expressions alone is an unreliable task: people systematically disagree on what emotions faces express. Emotion recognizers trained on such inconsistent labels cannot achieve meaningful accuracy. Context is necessary to make emotion perception reliable. It can be organized into three sources:

- sender context: information about the person expressing the emotion;
- situation context: about the surrounding physical and social environment;
- perceiver context: about the observer of the person expressing the emotion.

Sender context has been identified by psychology research as relevant for emotion recognition done by humans. Technology must use it to gain human-level emotional intelligence. Despite the evidence, according to previous reviews, individual datasets don't specifically account for sender context through systematic variation.

2. Research Objectives

RQ1: What sender context is captured in existing datasets?

- RQ1a: Are senders diverse across the datasets?
- RQ1b: Are senders balanced across datasets?

RQ2: How is sender context implemented in CAER systems?

- RQ2a: Does sender context impact generalization?
- RQ2b: Does sender context improve bias mitigation?

3. Methodology

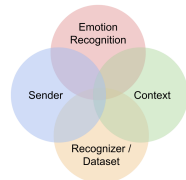


Figure 2: Key Concept Visualization

Exclusion Criteria:

- Doesn't introduce emotion dataset or emotion recognition system
- Doesn't use sender context
- Doesn't have audio and video data
- Published before 2019 or after 20 April 2026
- Not published in English
- Not peer-reviewed
- Not a journal article or conference paper
- Full text not accessible via university access

Scopus Query

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TITLE-ABS-KEY ( ( ( emotion OR emotional OR affect OR affective ) W/1 ( recognition OR detection OR inference OR prediction ) ) AND ( sender OR expresser OR expessor OR poser OR experiencer OR participant OR speaker ) AND ( "personal context" OR "individual context" OR "sender context" OR "contextual cue" OR "contextual information" OR "social context" OR "cultural context" ) AND ( recogniser OR recognizer OR detector OR "machine learning" OR predictor OR database OR dataset ) )
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4. Search Results



5. Sender Context in Datasets

Table 1: Datasets with the sender contexts they record

DATASET	Personality	Age	Gender	Culture	Mood	Health	Experience
AMIGOS [1]	✓	✓	✓		✓	✓	
BIRAFFE2 [3]	✓	✓	✓				✓
Indian-AV [2]		✓	✓	✓			
MultiEMP [5]		✓	✓	✓			

6. Sender Context in Systems

Table 2: Systems with the sender contexts they use

SYSTEM	Personality	Gender	Culture	Voice	Mood
AMIGOS [1]	✓				✓
BIRAFFE2 [3]	✓				
Intercultural [4]			✓		
Meta-SER [8]		✓		✓	
MultiEMP [5]				✓	
Persona-CTG [6]	✓				
PGIF [7]	✓				

7. The Central Finding

Gap1: Datasets rarely achieve diversity and balance at once. There are no multi-culture corpora; broadly demographic datasets are gender-imbalanced.

Gap2: No system evaluates or mitigates bias. Sender attributes boost accuracy, but disparities across demographic subgroups go unmeasured.

8. Future work

Create demographically diverse emotion datasets with balanced representation across genders and cultures.

Implement bias-mitigation techniques in the design of fair and safe CAER systems.

Collaborate with other reviewers for more unbiased screening process.