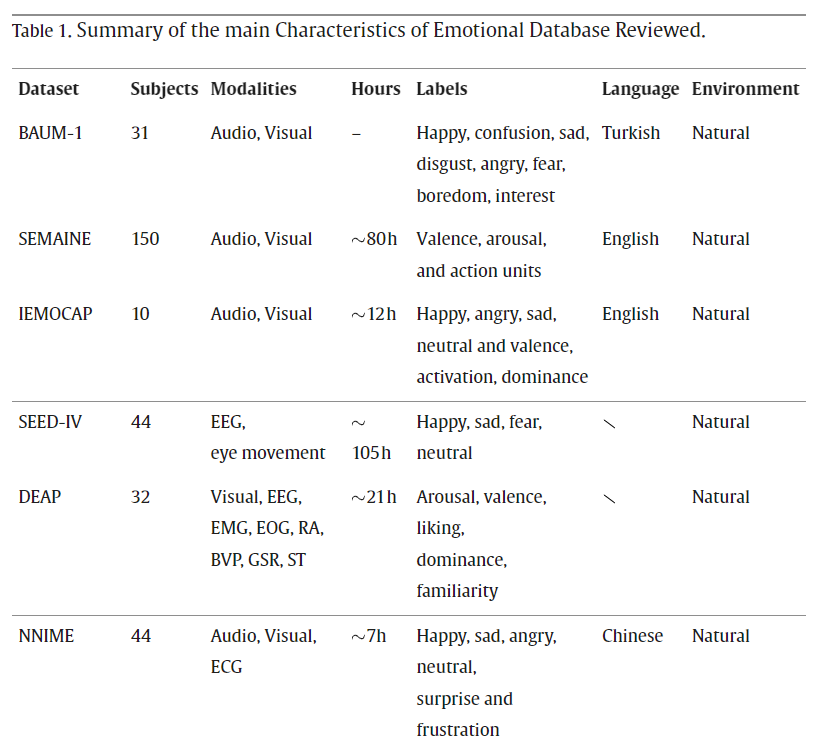
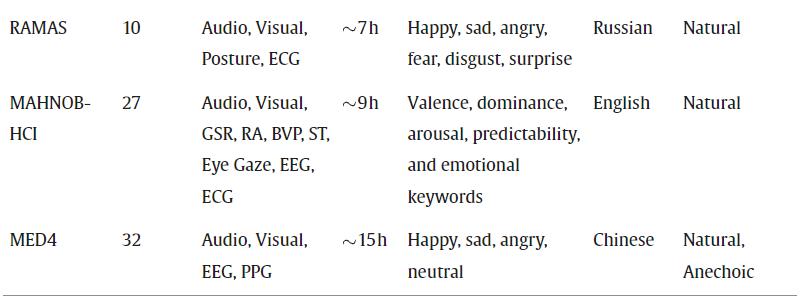
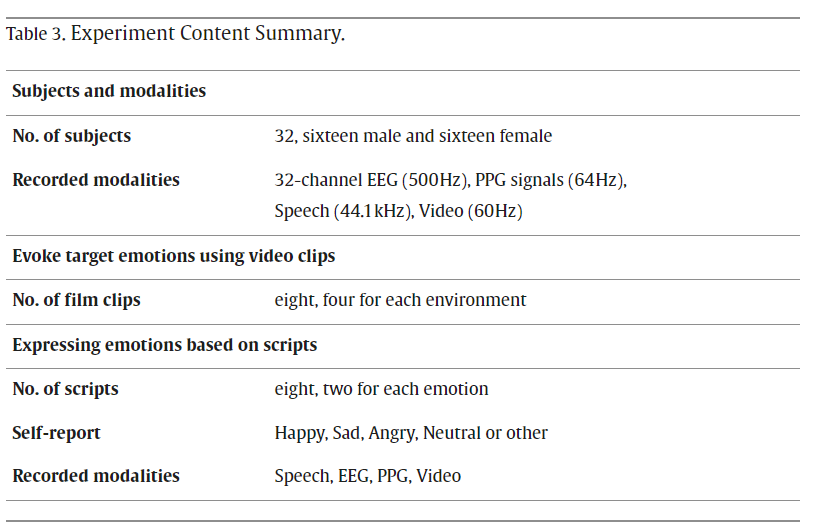
Datasets used:1. Multi-modal emotion recognition using EEG and speech signals:The MED4 database has been recorded separately in two different environments: a lab with natural noises and an anechoic room. 32 subjects first watched film clips contain target emotions (happy, sad, angry and neutral) and then read aloud pre-scripted text materials as the expression of such emotions. Speech, video, EEG and PPG signals were recorded during the experiment, but only the signals when subjects expressing emotions were used to construct the MED4 database.





Speech data were captured by one condenser microphone (Audio Technica ATR2500) with a sampling rate of 44.1 kHz and presented in Adobe Audition software. EEG data were continuously collected using a 32-channel EEG module (NeurOne) with electrodes arranged according to international 10–20 system with a sampling rate of 500 Hz. PPG was collected by an ear clip sensor which attached to the earlobe with a sampling rate of 64 Hz and displayed in ErgoLab software. Speech, EEG and PPG signals were recorded on a dedicated PC. E-prime software was installed in another PC that controls the protocol of the experiment, including presenting the stimuli, managing the procedure and synchronizing the data recording. When subjects were ready to read the script, they were asked to press any key on the keyboard to start the recording of speech. The E-prime software sent synchronization markers directly to the EEG, PPG collection software to align the EEG, PPG and speech signals. Facial videos of subjects were collected via webcam of the stimuli PC with a sampling rate of 60 Hz.



Paper Link: <https://www.sciencedirect.com/science/article/pii/S0010482522006503?casa_token=7UMSjKxBLigAAAAA:DvORrPFYrbN9126i5CfQuDIoaNgrw_d1vOylPdXdpApb5FJWbM2wOD2EAMrPcIni3CLNLD8km0A#d1e729>

2. An Affective Service based on Multi-Modal Emotion Recognition, using EEG enabled Emotion Tracking and Speech Emotion Recognition:

In [7] Ramirez and Vamvakousis conduct a study where six individuals (male and female) listen to emotion-annotated sounds to collect EEG data. The sounds selected, were meant to evoke emotions in the extremes of the arousal/valence panel: positive/aroused, positive/calm, negative/calm and negative/aroused [7]. They then apply machine learning techniques to train classifiers to categorize high/low arousal and positive/negative valence emotional states. The classifiers can then detect emotions such as happiness, anger, sadness and calmness, following the circumplex model. The interesting outcome of this study was that the EEG data contains sufficient information to identify arousal and valence states and that machine leaning methods are capable of correctly detecting and distinguishing between primary emotions.

Paper Link:

<https://ieeexplore.ieee.org/abstract/document/9277291?casa_token=nnRmAxI1lXIAAAAA:EmP9s6Tpae92K4j6j5ITMohLz1Hk2wBiuk5CeAUmDGbRF6zaVk3_xwniHz_WIEo8dmbTh7C0y6ZmgQ>