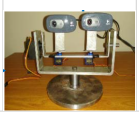
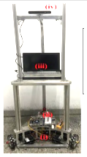
Paper Title	Reference	Robot Used	Image of robot	Databases Used (training)	Databases Used (testing)	User Participation?	Machine Learning Tech	Application
Facial Recognition Based Papers								
Softmax regression based deep sparse autoencoder network for facial emotion recognition in human-robot interaction	Ref ID: 1	ESRS (Emotional Service Robot System)		JAFFE, CK+	JAFFE, CK+	Yes	DNN with sparse representation for learning. Softmax regression for classification	No
A hybrid deep learning neural approach for emotion recognition from facial expressions for socially assistive robots	Ref ID: 10	Nao robot		KDEF 70%	CK+, (KDEF 30%)	Yes but only 4 participants	CNN and a SVM (support vector machine)	No
A Multi-Population FA for Automatic Facial Emotion Recognition	Ref ID: 90	Talks about usage in robots	X	250 images from CK+	175 images from: CK+, MMI, JAFFE, Bosphorus 3D and BU-3DFE	No only database testing	hvnLBP (horizontal vertical neighborhood Local Binary Patterns)	No
Accuracy improvement of facial expression recognition in speech acts: Confirmation of effectiveness of information around a mouth and GAN-based data augmentation	Ref ID: 91	Talks about usage in robots	X	RML (22040 images)	RML (670)	No only database testing	CNN	No
Adaptive Feature Selection-Based AdaBoost-KNN With Direct Optimization for Dynamic Emotion Recognition in Human–Robot Interaction	Ref ID: 37	ESRS (Emotional Service Robot System)		JAFFE 70%	JAFFE 30%	Yes 10 volunteers	KNN	No
Adaptive Multimodal Emotion Detection Architecture for Social Robots	Ref ID: 58	X (paper mentions Nao but doesn't seem to use it)	X	IEMOCAP 80%	IEMOCAP 20%	No only database testing	EmbraceNet+ I cannot find what kind it is	No
Affective Facial Expressions Recognition for Human-Robot Interaction	Ref ID: 12	Nao robot		KDEF	KDEF	Yes, only 6 participants	SVM, SAG (Stochastic average Gradient), RFC (Random Forest Classifier)	No
An Active Learning Paradigm for Online Audio-Visual Emotion Recognition	Ref ID: 19	RPi and an RPA (Robotic Process Automation)	X	RML and BAUM-1s	RML and BAUM-1s	No only database testing	2 CNNs and a DNN	No
An intelligent facial expression recognition system with emotion intensity classification	Ref ID: 71	Virtual Robot	X	CMU Multi-PIE (6936 images)	CMU Multi-PIE (1728 images)	Yes, 13 participants	CNN	No
Automatic RGB inference based on facial emotion recognition	Ref ID: 27	Talks about usage in robots	X	CK+	CK+	No only database testing	CNN+RNN	No but talks about possible applications
CNN and LSTM Based Facial Expression Analysis Model for a Humanoid Robot	Ref ID: 17	Harley		CK+		Yes	CNN+LSTM	No
CNN-based broad learning with efficient incremental reconstruction model for facial emotion recognition	Ref ID: 67	ESRS (Emotional Service Robot System)		JAFFE 70%	JAFFE 30%	No only database testing	CNNBL (Broad Learning)	No
Continuous Emotion Recognition via Deep Convolutional Autoencoder and Support Vector Regressor	Ref ID: 53	Talks about usage in robots	X	FER	RECOLA 2016	No only database testing	CNN	No
Decision-Level Fusion Method for Emotion Recognition using Multimodal Emotion Recognition Information	Ref ID: 31	Talks about usage in robots	X	eNTERFACE'05, SAVEE	eNTERFACE'05, SAVEE	No only database testing	CNN and ANN + k-NN	For a social robot that was in development
Deep emotion recognition through upper body movements and facial expression	Ref ID: 63	Talks about usage in robots	X	FER-2013, FABO	FABO	No only database testing	CNN + LSTM	No
Deep Learning for Real Time Facial Expression Recognition in Social Robots	Ref ID: 32	Nao robot		Gamma corrected versions of CK+, JAFFE, FEEDTUM and KDEF (70%)	Gamma corrected versions of CK+, JAFFE, FEEDTUM and KDEF (30%)	Yes, 7 female, 21 male	CNN	No
Design of Attendance System Based on NAO Face, Speech and Emotion Recognition		Nao robot		N/A	N/A	N/A	N/A	This project, whilst not doing anything new, or adding anything to the robots repertoire, tries to make full use of the robots current capabilities to facilitate HR
Development of a GPU-Based Human Emotion Recognition Robot Eye for Service Robot by Using Convolutional Neural Network	Ref ID: 51	Robot eye		80%	20%	Yes, if you count the researchers	Haar-Cascade then CNN	Yes, a two 'robot eyes' with the ability to swivel 60 degrees in L/R and 30 degrees pan

ElderReact A multimodal dataset for recognizing emotional response in aging adults	Ref ID: 23	Talks about usage in robots	X	ElderReact	ElderReact	No only database testing	SVM	No
Emotion detection for social robots based on nlp transformers and an emotion ontology	Ref ID: 21	Talks about usage in robots	X	2018-E-c-En-train	2018-E-c-En-test-gold	No only database testing	NLP	No
Emotion Recognition from Face Images in an Unconstrained Environment for usage on Social Robots	Ref ID: 39	Nao robot		Multi-PIE	CK+, JAFFE, FEEDTUM and KDEF datasets	No only database testing	(CNN) architecture pre-trained as a Stacked Convolutional Autoencoder (SCAE)	No
Emotion Recognition Based on Type-2 Recurrent Wavelet Fuzzy Brain Emotion Learning Network Model	Ref ID: 81	Talks about usage in robots	X	ImageNet	Jaffe, BU-3DFE, CASIA, SAVEE, and FAU	No only database testing	IT2RWFBELN	No
Emotion Recognition using Facial Expressions in Children using the NAO Robot	Ref ID: 18	Nao robot		AffectNet	Child Affective Facial Expression Database, AM-FED and EmoReact	No only database testing	CNN	Their tests are having the Nao robot look at pictures of children on a monitor for testing 'real world' performance.
Extended LBP based Facial Expression Recognition System for Adaptive AI Agent Behaviour	Ref ID: 50	Talks about usage in robots	X	CK+, MMI, JAFFE, Bosphorus 3D and BU-3DFE - 1250 images from each	CK+, MMI, JAFFE, Bosphorus 3D and BU-3DFE - 200 images from each	No only database testing	LBP	No
Face Detection and Recognition of the Seven Emotions via Facial Expression: Integration of Machine Learning Algorithm into the NAO Robot	Ref ID: 40	Nao robot		Augmented CK+	CK+	Yes and they used the pictures from the participants to augement the database	RSVM (Radial Basis Function Kernel Support Vector Machine)	Yes they made a Nao robot react to emotions shown by participants
Facial Emotion Recognition using Deep Convolutional Networks	Ref ID: 11	Talks about usage in robots	X	CK+	CK+	No only database testing	CNN	No
Facial emotion recognition in real-time and static images	Ref ID: 24	Talks about usage in robots	X	CK+	CK+	No only database testing	SVM	No
Facial Expressions Recognition for Human–Robot Interaction Using Deep Convolutional Neural Networks with Rectified Adam Optimizer	Ref ID: 14	Nao robot		Pretrained on COCO and Google OpenImage dataset. CK+, JaFFE and KDEF 24,336 training, 6957 validation	CK+, JaFFE and KDEF 3479 test set	No only database testing		Not in this paper however the state that they wish to use it for interacting with children with autism
Hand-over-Face Gesture based Facial Emotion Recognition using Deep Learning	Ref ID: 45	Talks about usage in robots	X				CNN and RNN	
Interactive Robot Learning for Multimodal Emotion Recognition	Ref ID: 28	Pepper Robot		Hand made database See Ref ID:66	Hand made database	Yes they actually did 192 experiments in total	CNN for Gait, SVM for Thermal Face	No
LARa: a robotic framework for human-robot interaction on indoor environments	Ref ID: 93	Pioneer P3-DX robot, LARa robot (laptop on a stand affixed to the Pioneer, with a Kinect too)		FER+, RAF, QIDER	FER+, RAF, QIDER	No only database testing	CNN	Deployed on a ROS based robot. However no other specific applications
Multimodal Emotion Recognition for Human Robot Interaction	Ref ID: 47	Talks about usage in robots	X	IMageNet, RAVDESS	IMageNet, RAVDESS	No only database testing	Two CNNs	No
Multimodal Emotion Recognition with Thermal and RGB-D Cameras for Human-Robot Interaction	Ref ID: 66	Pepper Robot		Hand made database	Hand made database	25 participants (12 females and 13 males)	CNN for Gait, SVM for Thermal Face	See Ref ID: 28
Multiple Models Using Temporal Feature Learning for Emotion Recognition	Ref ID: 88	Talks about usage in robots	X	MTCNN is pre-trained on VGGFace2 dataset [3] and CASIA-Webface dataset	MuSe-CaR	Just test on MuSe-CaR	MTCNN, SVM, LSTM, WaveNet (?)	No
LEMON: A Lightweight Facial Emotion Recognition System for Assistive Robotics Based on Dilated Residual Convolutional Neural Networks	Ref ID: 72	Ohmni Robot		CK+, JAFFE, KDEF, TFEID, SASE-FE	CK+ and JAFFE	Yes but only 1 participant a "healthy 28 year old female"	CNN	Yes it was created for the Ohmni robot
Optimized, robust, real-time emotion prediction for human-robot interactions using deep learning	Ref ID: 73	Nao robot		FER2013	JAFFE	No only database testing	CNN	No
Real-Time Emotional Recognition for Sociable Robotics Based on Deep Neural Networks Ensemble	Ref ID: 29	Talks about usage in robots	X	FER2013	FER2013	No only database testing	CNN	No

System and method for recognizing human emotion state based on analysis of speech and facial feature extraction; Applications to Human-Robot Interaction	Ref ID: 56	Talks about usage in robots	X	Just referred to as 'First database'	EURECOM Kinect Face Dataset	300 individuals (150 females and 150 males, 20 to 48 years old)	AU	They made a software package that accepts an audio file and video/image to deduce emotions
Co-regularization Facial Emotion Recognition Based on Multi-Task Facial Action Unit Recognition	Ref ID: 115	Talks about usage in robots	X	FER-2013 and EmotioNet	FER-2013 and EmotioNet	No only database testing	CNN	No
A Self Learning System for Emotion Awareness and Adaptation in Humanoid Robots	Ref ID: 114	Nao robot		Subset of AffectNet called NLDD	Subset of AffectNet called NLDD	Yes, 75 participants	Two CNNs	No
Audio and Video-based Emotion Recognition using Multimodal Transformers	Ref ID: 112	Talks about usage in robots	X	RAVDESS, SAVEE, CREMA-D	RAVDESS, SAVEE, CREMA-D	No only database testing	RNN + LTSM	No
Coupled Multimodal Emotional Feature Analysis Based on Broad-Deep Fusion Networks in Human–Robot Interaction	Ref ID: 101	Don't know robots name		MMI Facial Expression and UCF101	MMI Facial Expression and UCF101	No only database testing	BDFN	Yes they made it for the social robot depeicted in the paper
Emotion recognition by web-shaped model	Ref ID: 98	Talks about usage in robots	X	CK+ KDEF (70%)	CK+ KDEF (30%)	No only database testing	KNN	No
Human–Robot Collaboration Using Sequential-Recurrent-Convolution-Network-Based Dynamic Face Emotion and Wireless Speech Command Recognitions	Ref ID: 111	Omidirectional service robot		Pre-trained on NTUST-IRL, KDEF, and JAFFE. Fully trained on CK+	NTUST-IRL, KDEF, and JAFFE and CK+	No only database testing	CNN	Yes, seems that it is a robot deisnged to take commands such as to follow the user around a building
Utilizing an Emotional Robot Capable of Lip-Syncing in Robot-Assisted Speech Therapy Sessions for Children with Language Disorders	Ref ID: 99	RASA		AffectNet		Yes	CNN	Yes it is for the robot to be able to teach children ASL
Audio Based Papers								
3D CNN-Based Speech Emotion Recognition Using K-Means Clustering and Spectrograms	Ref ID: 6	Talks about usage in robots	X	SAVEE, RML, and eNTERFACE'05	SAVEE, RML, and eNTERFACE'05	No only database testing	CNN + K-Means Clustering	No
A Comparative Analysis of Different Approach for Basic Emotions Recognition from Speech	Ref ID: 79	Talks about usage in robots	X	Emo-DB 80%	Emo-DB 20%	No only database testing	SVM, XGBoost, DNN, CNN	No
A feature selection model for speech emotion recognition using clustering-based population generation with hybrid of equilibrium optimizer and atom search optimization algorithm	Ref ID: 74	Uses robotics papers for references	X		SAVEE, EmoDB, RAVDESS, and IEMOCAP	No only database testing	SVM and KNN	No
Adaptive Multimodal Emotion Detection Architecture for Social Robots	Ref ID: 58	Talks about usage in robots	X	IEMOCAP	IEMOCAP	No only database testing	EmbraceNet+ combines modalities	No
An Active Learning Paradigm for Online Audio-Visual Emotion Recognition	Ref ID: 19	Talks about usage in robots	X	IEMOCAP, AffectNet, RML, BAUM-1S	IEMOCAP, AffectNet, RML, BAUM-1S	No only database testing	Two CNNs and a DNN	No
Attention-based sequence modeling for categorical emotion recognition with modulation spectral feature	Ref ID: 87	Talks about usage in robots	X		IEMOCAP	No only database testing	LSTM	No
Clustering-Based Speech Emotion Recognition by Incorporating Learned Features and Deep BiLSTM	Ref ID: 4	Talks about usage in robots	X	IEMOCAP, EMO-DB, and RAVDESS	IEMOCAP, EMO-DB, and RAVDESS	No only database testing	BiLSTM	No
Convolutional Neural Network (CNN) Based Speech-Emotion Recognition	Ref ID: 15	Talks about usage in robots	X	SAVEE	SAVEE	No only database testing	CNN using MFCC	No
Decision-Level Fusion Method for Emotion Recognition using Multimodal Emotion Recognition Information	Ref ID: 31	Talks about usage in robots	X	eNTERFACE'05 and SAVEE	eNTERFACE'05 and SAVEE	No only database testing	KAIST(?) based CNN, ANN and k-NN to classify the combination of results	No
Emotion Recognition From Speech to Improve Human-robot Interaction		Talks about usage in robots	X	EMODB, CASIA	EMODB, CASIA	No only database testing	KNN and LSTM	No
Emotion Recognition from Speech for an Interactive Robot Agent		Talks about usage in robots	X	Berlin database	Berlin database	No only database testing	multilayer Perceptron neural networks, Rules Classifier oneR and Tree Classifier J48	Yes, they made an android app
Emotion-Recognition from Speech-based Interaction in AAL Environment		Nao robot		∈motion dataset	∈motion dataset	No	SVM, Decision trees, ANN, and KNN	They create it to put in the Nao robot to be used for emotion recognition vrom the voices of elderly people

Hierarchical Attention Approach in Multimodal Emotion Recognition for Human Robot Interaction		Talks about usage in robots	X	Not stated	eNterface'05	No only database testing	CNN for face + CNN with bi-directional LSTM model was used to extract features from MFCC	No
I-GCN Incremental Graph Convolution Network for Conversation Emotion Detection		Talks about usage in robots	X	Not stated	IEMOCAP, MELD, DailyDialog	No only database testing	I-GCN	No
Image based Emotional State Prediction from Multiparty Audio Conversation		Talks about usage in robots	X	MELD (80%)	MELD (20%)	No only database testing	CNN	No
Multi-resolution modulation-filtered cochleagram feature for LSTM-based dimensional emotion recognition from speech		Talks about usage in robots	X	RECOLA and SEWA	RECOLA and SEWA	No only database testing	multi-resolution modulation-filtered cochleagram feature LSTM	No
Multimodal Emotion Recognition for Human Robot Interaction		Talks about usage in robots	X	IMageNet RAVDESS	IMageNet RAVDESS	Very limited real world test, just checking emotions are recognised on one person	Two CNNs with a decision tree to combine the two	No
On the Robustness of Speech Emotion Recognition for Human-Robot Interaction with Deep Neural Networks		iCub 		IEMOCAP	IEMOCAP	No only database testing	RNN and CNN	No
Speaker-Independent Emotion Recognition for Interstate Measuring of User Based on Separation and Rejection		Mung 		KES	KES	No only database testing. Which for what they are doing doesn't make sense	Gaussian mixture model (GMM)	Designed to be used as in the Mung robot, however they don't actually deploy it
Speech emotion recognition using MELBP variants of spectrogram image		Talks about usage in robots	X	SAVEEE	SAVEE	No only database testing	Extended local binary pattern	No
System and method for recognizing human emotion state based on analysis of speech and facial feature extraction; Applications to Human-Robot Interaction	Ref ID: 56	Talks about usage in robots	X	Just referred to as 'First database'	EURECOM Kinect Face Dataset	300 individuals (150 females and 150 males, 20 to 48 years old)	AU	They made a software package that accepts an audio file and video/image to deduce emotions
Two-layer fuzzy multiple random forest for speech emotion recognition in human-robot interaction		Talks about usage in robots	X		CASIA corpus and Berlin EmoDB	No only database testing	TLFMRF, RF, and BPNN	No
Audio and Video-based Emotion Recognition using Multimodal Transformers		Talks about usage in robots	X		RAVDESS, the SAVEE, and the CREMA-D	No only database testing	RNN + LSTM	No
Improved multi-lingual sentiment analysis and recognition using deep learning		Talks about usage in robots	X	EMO-DB [20], EMOVO [24], SAVEE [25] and URDU [7]	EMO-DB [20], EMOVO [24], SAVEE [25] and URDU [7]	No only database testing	2D-CNN	No
Multimodal Mood Recognition for Assistive Scenarios. Procedia Computer Science		Talks about usage in robots	X	Emovo		No only database testing	?	No
Paralinguistic Cues in Speech to Adapt Robot Behavior in Human-Robot Interaction		ROBIN 		RAVDESS, TESS and RRLabSED	RAVDESS, TESS and RRLabSED	Did real world tests but on 15 participant, very limited age range, only 21-30, 9 were male 6 were female.	SVM	System made for the ROBIN robot
Real-Time Multimodal Emotion Recognition in Conversation for Multi-Party Interactions		Talks about usage in robots	X	EMOCAP [3], DailyDialog [11] and MELD [16]	EMOCAP [3], DailyDialog [11] and MELD [16]	Does not do real world tests. Says its real time but they actually give it a transcript of a previously had conversation and it give outputs on that in "real time"	Knowledge Aware Multi-Headed architecture (KAMUH)	No
Pose Recognition Based Papers								
3D Human Sensing, Action and Emotion Recognition in Robot Assisted Therapy of Children with Autism		Zeno 		H80kPartial	H80kPartial	Does test with children with autism	CNN and RNN	No
Deep emotion recognition through upper body movements and facial expression	Ref ID: 63	Talks about usage in robots	X	FER-2013, FABO	FABO	No only database testing	CNN + LSTM	No
Emotion recognition from body expressions with a neural network architecture		Nao robot 		Body Expressions of Emotion (60%)	Body Expressions of Emotion (40%)	Data set they used what created from 19 of their participants	Gamma Grow When Required	No
Interactive Robot Learning for Multimodal Emotion Recognition	Ref ID: 28	Pepper Robot 		Hand made database See Ref ID:66	Hand made database	Yes they actually did 192 experiments in total	CNN for Gait, SVM for Thermal Face	No
Multimodal Emotion Recognition with Thermal and RGB-D Cameras for Human-Robot Interaction	Ref ID: 66	Pepper Robot 		Hand made database	Hand made database	25 participants (12 females and 13 males)	CNN for Gait, SVM for Thermal Face	See Ref ID: 28

Coupled Multimodal Emotional Feature Analysis Based on Broad-Deep Fusion Networks in Human–Robot Interaction	Ref ID: 101	Don't know robots name		MMI Facial Expression and UCF101	MMI Facial Expression and UCF101	No only database testing	BDFN	Yes they made it for the social robot depeicted in the paper
Elderly Care Home Robot using Emotion Recognition, Voice Recognition and Medicine Scheduling		Simulated Turtlebot3		Tufts	Tufts	No only database testing	CNN + Cycle-GAN on Thermal images	No
Global and local feature fusion via long and short-term memory mechanism for dance emotion recognition in robot		Talks about usage in robots	X	RML, SAVEE, and a self-built dance video database	RML, SAVEE, and a self-built dance video database	No only database testing	KECA + DMCCA and and SVM to classify	No
Multitask Touch Gesture and Emotion Recognition Using Multiscale Spatiotemporal Convolutions With Attention Mechanism		Talks about usage in robots	X	TouchGET	CoST	No only database testing	MUSCAT	No