Summary

In the field of emotional classification, there seems to be at least two major events, the EmotiW challenge and the AVEC workshop. LSTM's, deep belief networks, and CNN's seem to be the most common networks and there's also common mention of ELM's. Many of the projects seem to use the OpenFace library. There doesn't seem to be as much research on continuous output or unsupervised learning, although what research does exist seems to be recent. The continuous output studies were almost always limited to 1 or 2 dimensions. There was only one paper I found with truly multi-dimensional unsupervised emotion recognition. There seems to be a general shift in the last 5 years from lab data sets to in-the-wild data sets. Multimodal data and learning seems to be a recent shift in affect recognition as well.

Papers

2019, A meta analysis of affect recognition
"Deep Learning for Human Affect Recognition: Insights and New Developments"
https://arxiv-org.srv-proxy2.library.tamu.edu/pdf/1901.02884.pdf

2018, attention and emotional classification challenge
"EmotiW 2018: Audio-Video, Student Engagement and Group-Level Affect Prediction"
https://arxiv-org.srv-proxy2.library.tamu.edu/pdf/1808.07773.pdf
Notable points
- used OpenFace library
- challenge 1
  - 3 emotional categories
  - dataset of ~250 videos
  - LSTM, Mean Square Error of 0.15
- challenge 2
  - used Group Affect Database, approximately 20K images
  - 3 emotional categories
  - Inception V3 network, 3 layers, 61% test accuracy

2019, estimating attention and emotion with ordinal data
"Towards emotion-sensitive learning cognitive state analysis of big data in education: deep learning-based facial expression analysis using ordinal information"
https://link.springer.com/article/10.1007/s00607-019-00722-7

2019, data fusing for continuous emotion recognition
"Incomplete Cholesky Decomposition based Kernel Cross Modal Factor Analysis for Audiovisual Continuous Dimensional Emotion Recognition"
http://eds.a.ebscohost.com.srv-proxy2.library.tamu.edu/eds/pdfviewer/pdfviewer?
vid=0&sid=5df1462f-cd4a-40a9-a71e-8df6caea97a4%40sessionmgr4008
Notable

2016, multimodal emotion recognition
"Multimodal emotion recognition using deep learning architectures"
https://ieeexplore.ieee.org/abstract/document/7477679
Notable
- Wasn't able to read the paper (not available in TAMU library)
- used face, body gesture, voice and physiological signals
- 3 different intensities of expressions
- 23 different emotion

- used deep belief network

2018, 7 category emotional classification
"Multi-Region Ensemble Convolutional Neural Network for Facial Expression Recognition"
https://arxiv-org.srv-proxy2.library.tamu.edu/abs/1807.10575?
Notable
- AFEW 7.0 and RAF-DB facial datasets
- Multi-Region Ensemble CNN
- Used C++ library, Dlib3 face detector to locate the 68 facial landmarks

2012, continuous affect sensing
"A multitask approach to continuous five-dimensional affect sensing in natural speech"
https://dl.acm.org/citation.cfm?id=2133372
Notable:
- SEMAINE database

2018, classification including skeleton data
"Group-Level Emotion Recognition Using Hybrid Deep Models Based on Faces, Scenes, Skeletons and Visual Attentions"
https://dl.acm.org/citation.cfm?id=3264990

2018, video expression analysis
"Prediction and Localization of Student Engagement in the Wild"
Notable
- LBP-TOP Feature Extraction
- OpenFace library
- sampled at 6fps

2019, continuous dimension emotion
"Learning Hierarchical Emotion Context for Continuous Dimensional Emotion Recognition From Video Sequences"
https://ieeexplore.ieee.org/abstract/document/8712534

2019, unsupervised emotion recognition
"Human emotion recognition using deep belief network architecture"
https://www.sciencedirect.com/science/article/pii/S1566253518301301

2019, classification of emotions using text, emoji, and images
"Multimodal Emotion Classification"
https://arxiv-org.srv-proxy2.library.tamu.edu/pdf/1903.12520.pdf

2015, complex emotion classification
"Automated recognition of complex categorical emotions from facial expressions and head motions"
https://ieeexplore.ieee.org/abstract/document/7344595

2016, continuous estimation of valence states of emotion
"Multi-Modal Audio, Video and Physiological Sensor Learning for Continuous Emotion Prediction"
https://dl.acm.org/citation.cfm?id=2988264
Notable
- Wasn't able to read the paper (not available in TAMU library)
- supervised and unsupervised

- Audio Video Emotion Challenge (AVEC) 2016
- sparse coding

2016, combine correlation and mean squared error into a single loss function
"Discriminatively Trained Recurrent Neural Networks for Continuous Dimensional Emotion Recognition from Audio"
https://sewaproject.eu/files/338a1be0-486e-43ae-c09f-4e88236e62df.pdf

2012, incredibly useful techniques for getting facial-expression data
"Collecting Large, Richly Annotated Facial-Expression Databases from Movies"
https://ieeexplore-ieee-org.srv-proxy2.library.tamu.edu/document/6200254

2010, used SVN with EEG to get 83% accuracy with 4 categories
"EEG-Based Emotion Recognition in Music Listening" by several authors
https://ieeexplore.ieee.org/abstract/document/5458075

2019, 5 category audio emotion classification
"Machine learning for the recognition of emotion in the speech of couples in psychotherapy using the Stanford Suppes Brain Lab Psychotherapy Dataset"
https://arxiv.org/abs/1901.04110

2019, ELM fusion for emotion classification on big data
"Emotion recognition using deep learning approach from audio–visual emotional big data"
https://www.sciencedirect.com/science/article/pii/S1566253517307066

2005, used physiological responses for measuring emotions.
"An empirical study of machine learning techniques for affect recognition in human-robot interaction" by Changchun Liu, P. Rani, and N. Sarkar.
https://ieeexplore-ieee-org.srv-proxy2.library.tamu.edu/document/1545344

2019, individualized aspects of emotion expressions
"A Personalized Affective Memory Neural Model for Improving Emotion Recognition"
https://arxiv.org/abs/1904.12632
Notable:
- used GANs