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| **Paper reference (year)** | **Short summary (method flow / features / classifier)** | **Technique (features → classifier)** | **Dataset(s) used** | **GitHub link (implementation / reproduction)** |
| C. Shan, S. Gong & P. W. McOwan — *Facial expression recognition based on Local Binary Patterns: A comprehensive study.* Image and Vision Computing (2009). ([eecs.qmul.ac.uk](https://www.eecs.qmul.ac.uk/~sgg/papers/ShanGongMcOwan_IVC09.pdf?utm_source=chatgpt.com)) | Thorough empirical study showing that **Local Binary Patterns (LBP)** (and variants) provide robust appearance descriptors for FER. The paper tests region partitioning, histogram pooling, dimensionality reduction and classification pipelines; best results obtained with discriminative feature selection + classical classifiers. | LBP / LBP-TOP features → dimensionality reduction (e.g., LFDA/PCA) → classifiers such as **SVM**, k-NN, AdaBoost. | CK / CK+ (Extended Cohn-Kanade), JAFFE and other benchmarks used in experiments. | **LBP / LBP-TOP + SVM implementation (CK+ / SVM examples)** — example repo: estrm/lbptop-emotion-recognition. ([GitHub](https://github.com/estrm/lbptop-emotion-recognition?utm_source=chatgpt.com)) |
| M. S. Bartlett, G. Littlewort, C. Lainscsek, I. Fasel & J. R. Movellan — *Automatic recognition of facial actions in spontaneous expressions* (series of works 2002–2006; JMM/IEEE papers). ([inc.ucsd.edu](https://inc.ucsd.edu/mplab/46/media/Bartlett_JMM06.pdf?utm_source=chatgpt.com)) | Work on **automatic detection of Action Units (AUs)** in spontaneous video: face detection/alignment → Gabor / texture features → feature selection (AdaBoost) → per-AU classifiers. Emphasizes AU intensity estimation and real-time capability. | Gabor / texture features → **AdaBoost for feature selection** and **SVM / LDA** for classification (per AU). | RU-FACS (spontaneous), CK/CK+ variants and other spontaneous expression collections referenced. | **OpenFace (toolkit with AU detection & feature extraction)** — TadasBaltrusaitis/OpenFace (widely used implementation for AU extraction & classical pipelines). ([GitHub](https://github.com/TadasBaltrusaitis/OpenFace?utm_source=chatgpt.com)) |
| Y.-L. Tian, T. Kanade & J. F. Cohn — *Recognizing Action Units for Facial Expression Analysis.* IEEE TPAMI (2001). ([sites.pitt.edu](https://sites.pitt.edu/~jeffcohn/biblio/Tian%20TPAMI2001.pdf?utm_source=chatgpt.com)) | Foundational AU recognition pipeline: facial fiducials / registration → appearance (Gabor) + geometric features (landmarks / optical flow) → feature selection and classical classifiers; also explores temporal models for AU sequences. | Geometric (landmark displacements) + appearance (Gabor, optical flow) → classifiers such as **SVM**, **LDA**, HMM for temporal modelling. | CK (Cohn-Kanade), other lab datasets / prototypic expression sets used for AU/expression evaluation. | **OpenFace** (AU extraction & landmark/feature tools) — useful practical implementation for pipelines inspired by Tian et al. (TadasBaltrusaitis/OpenFace). ([GitHub](https://github.com/TadasBaltrusaitis/OpenFace?utm_source=chatgpt.com)) |
| M. J. Lyons, J. Budynek & S. Akamatsu — *Automatic classification of single facial images.* (1999). ([kasrl.org](https://www.kasrl.org/michael.pdf?utm_source=chatgpt.com)) | Early influential pipeline: align faces using a grid/landmarks → **Gabor wavelet representation** (multi-scale/orientation) → dimensionality reduction (PCA / LDA) → classification. Shows Gabor + LDA/nearest-neighbor works well for single-image expression classification. | Gabor wavelet features → PCA / LDA (Fisherfaces) → classifiers: **LDA / k-NN / SVM** (classical ML). | Small lab datasets of the era (CK / JAFFE / proprietary collections) used as baselines for single-image classification. | **Gabor + SVM/ASM implementations** — example repos: JustinCharbonneau/Facial-Expression-Recognition (Gabor + SVM comparison) and flyingzhao/FacialExpressionDetection (ASM + Gabor + SVM). ([GitHub](https://github.com/JustinCharbonneau/Facial-Expression-Recognition?utm_source=chatgpt.com)) |
| P. Carcagnì, E. Grosso, A. Del Bimbo — *Facial expression recognition and analysis (HOG study)* — comprehensive HOG study (2015). ([PMC](https://pmc.ncbi.nlm.nih.gov/articles/PMC4628009/?utm_source=chatgpt.com)) | Systematic study of **Histogram of Oriented Gradients (HOG)** descriptors for FER: face detection/alignment → HOG extraction (possibly per-region) → feature pooling and classification. Paper compares HOG performance vs other handcrafted descriptors. | HOG features → dimensionality reduction/selection → **SVM (RBF / linear)** and other classical classifiers (k-NN, NB) for multi-class FER. | CK / CK+, JAFFE and other public FER datasets evaluated in the study. | **HOG + SVM example repos**: Bouchenemehdi24/Facial-expression-recognition-with-HOG-and-SVM and spy14414/facial-expression-recognition-with-hog-and-svm. ([GitHub](https://github.com/Bouchenemehdi24/Facial-expression-recognition-with-HOG-and-SVM?utm_source=chatgpt.com)) |