

Extra Results

Classification of Weakly Labeled Data with Partial Equivalence Relations

Additional Clustering Results

(A) Performance comparison for linear techniques on Yale dataset

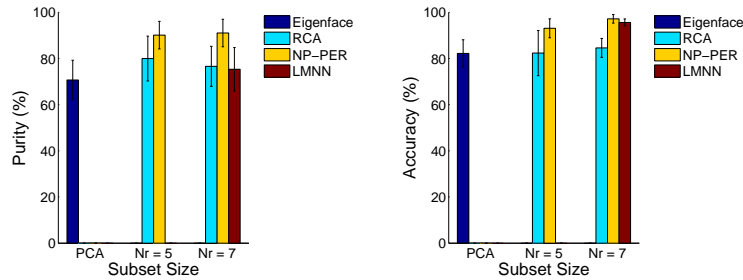


Figure 1: Clustering performance on Yale dataset with linear transformations. LMNN (Large Margin Nearest Neighbor [18]) is a supervised technique, and hence, tested only when $N_r = 7$.

(B) Performance comparison for kernel techniques on ORL dataset

Table 1: Clustering performance on ORL dataset with nonlinear transformations.

N_r	kRCA		kNP-PER	
	Purity (%)	Accuracy (%)	Purity (%)	Accuracy (%)
2	72.2 (± 4.2)	75.1 (± 3.9)	63.8 (± 3.4)	77.8 (± 2.0)
4	83.8 (± 3.6)	85.5 (± 3.1)	86.5 (± 2.4)	88.7 (± 2.0)
6	82.4 (± 2.7)	85.4 (± 1.8)	87.4 (± 2.2)	89.0 (± 1.7)

(C) Performance comparison for kernel techniques on FERET dataset

Table 2: Clustering performance on FERET dataset with nonlinear transformations.

N_r	kRCA		kNP-PER	
	Purity (%)	Accuracy (%)	Purity (%)	Accuracy (%)
2	79.4 (± 1.8)	82.0 (± 1.4)	86.8 (± 0.8)	87.4 (± 0.79)
3	99.0 (± 0.05)	99.0 (± 0.02)	99.0 (± 0.08)	99.0 (± 0.01)

A Part of the Video Dataset Used for Face Recognition



Figure 2: Illustration of face extraction and warping from video frames. Each row shows 20 frames from a chunk. The left most image displays the first frame while the rest of the images display the extracted faces from the subsequent frames warped using thin-plate-spline.

Face Warping Using Thin-Plate Splines

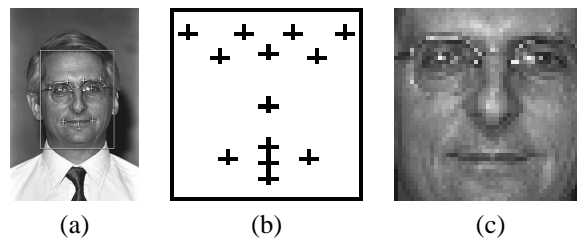


Figure 3: Illustration of face preprocessing in each frame. (a) Face detection and landmark extraction. (b) Warping of detected landmarks to the standard locations using a thin plate spline. (c) Final warped image obtained using bilinear interpolation.

A Part of the Retrieval Dataset

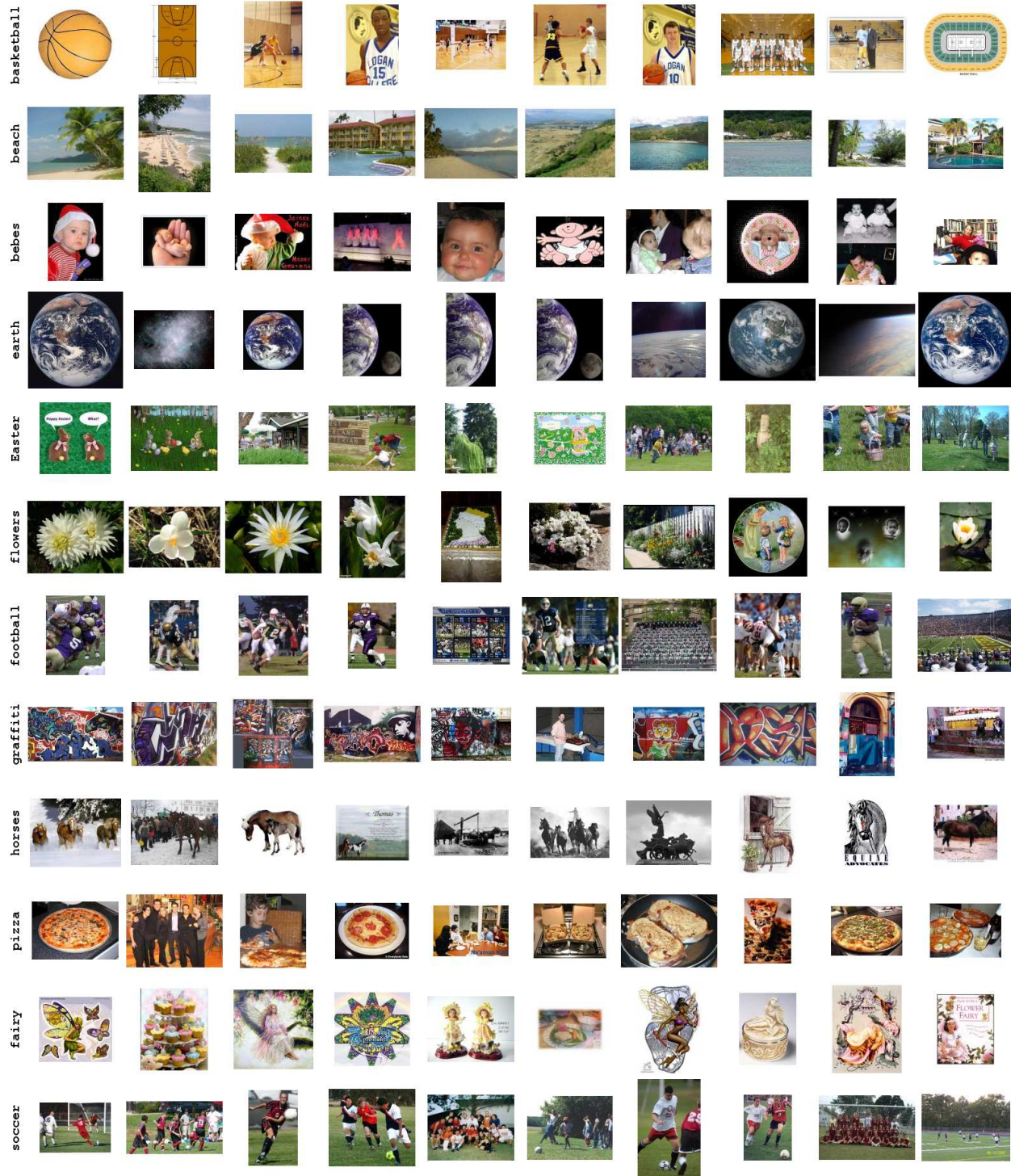


Figure 4: Example query terms and some of the images returned by a web search engine, that composed the retrieval dataset.