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## Prior Knowledge-Based Probabilistic Collaborative Representation for Visual Recognition

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### Abstract

Collaborative representation is an effective way to design classifiers for many practical applications. In this paper, we propose a novel classifier, called the prior knowledge-based probabilistic collaborative representation-based classifier (PKPCRC), for visual recognition. Compared with existing classifiers which use the collaborative representation strategy, the proposed PKPCRC further includes characteristics of training samples of each class as prior knowledge. Four types of prior knowledge are developed from the perspectives of image distance and representation capacity. They adaptively accommodate the contribution of each class and result in an accurate representation to classify a query sample. Experiments and comparisons on four challenging databases demonstrate that PKPCRC outperforms several state-of-the-art classifiers.

### Keywords

**Author Keywords:** Training; Visualization; Collaboration; Probabilistic logic; Databases; Face recognition; Correlation; Collaborative representation; prior knowledge; representation-based classifier; visual recognition  
**KeyWords Plus:** FACE RECOGNITION; SPARSE; CLASSIFICATION

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