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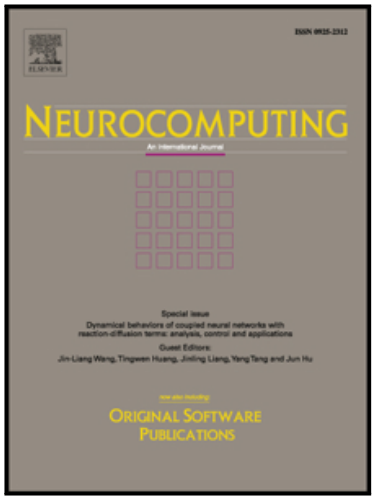

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A Collaborative-Competitive Representation Based Classifier Model

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Abstract

Collaborative representation based classifier (CRC) model has been widely applied in pattern recognition and machine learning. The mechanism of CRC model mainly includes two steps: first, using the training samples across all classes to collaboratively represent the test sample; second, assigning the test sample to the class with the minimal residual. Essentially, the first step exploits the collaborative ability of all training sample to represent the test sample, and the second step exploits the competitive ability of the training samples in each class to represent the test sample. However, traditional CRC model views the first step and second step as two independent procedures and ignores their relationships. To overcome this shortage, in this paper, we propose a novel collaborative-competitive representation based classifier (CCRC) model, which incorporates a regularization constraint term into the objective function of CRC. Through theoretical analysis, we find that minimizing this constraint term is equivalent to the nearest-subspace classifier

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