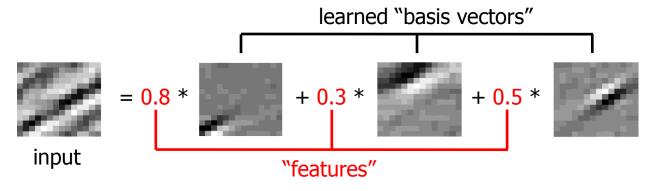


Exponential family sparse coding with application to self-taught learning with text documents

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- Self-taught learning
 - Example: Classifying "Baseball" or "Football" webpages
 - given only a few labeled examples of "Baseball" or "Football" webpages
 - along with access to a large corpus of unrelated documents.
 - Raina et. al (ICML'07) applied "sparse coding" to this problem.
 - learn a sparse, higher-level representation from the unlabeled data, and apply the new representation to classification task.





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- Our approach: Exponential family sparse coding
 - Works well for self-taught learning with text classification.
 - 9-23% average error reduction over raw bag-of-words features.
 - Better accuracy than (Gaussian) sparse coding, Exponential family PCA, and Latent Dirichlet Allocation (LDA).
 - An efficient algorithm for general L1-regularized convex optimization problems.
 - Iteratively solves quadratic approximations with L1-penalty.
 - 2-20x faster for moderate sized problems with sparse solutions compared to state-of-the-art algorithms. (Lee et. al (AAAI'06), Koh et. al (JMLR'07), Andrew & Gao (ICML'07), Yu et. al (ICML'08)).