Classification and Reconstruction of Chinese Font Style Milestone 2

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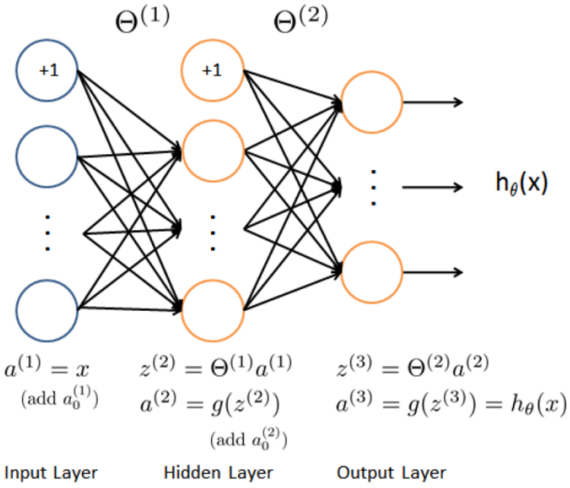
To achieve the proposed goal, at this stage, we want to propose two algorithms, SIFT(Scale Invariant Feature Transform) algorithm that is available in many open sources to identify potentially useful features from the converted raw images and the CNN algorithm to dynamically learn the features for classification purpose and to realise the transformation.

To make it more concrete, we will import a large number of characters for each font type and we apply the raw processing method mentioned in the previous milestone report. After we get the converted raw images, first we divide this database into two parts, the training set and the validation set. We use the SIFT method to extract features from each font class in the training set and depending on the amount of features and our purpose, we may further filter these features (maybe KNN algorithm) to obtain an appropriate amount of test features. Depending on the result of the test set, we may or may not update the font library.

After we have a group of features for each font family, we will use CNN methods to learn the transformational non-parametrical information from font A to font B. Like in the previous paragraph, we would divide the data set into two parts, the validation set and the training set. We would also choose an appropriate cost function based on the specific data (the attached cost function is with regularisation).



$$J(\theta) = \frac{1}{m}\sum_{i=1}^{m}\sum_{k=1}^{K}\left[-y_k^{(i)}\log((h_\theta(x^{(i)}))_k) - (1-y_k^{(i)})\log(1-(h_\theta(x^{(i)}))_k)\right] + \frac{\lambda}{2m}\left[\sum_{j=1}^{25}\sum_{k=1}^{400}(\Theta_{j,k}^{(1)})^2 + \sum_{j=1}^{10}\sum_{k=1}^{25}(\Theta_{j,k}^{(2)})^2\right].$$