Visual Bits -7/2

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Finding the other columns of visual bits



1. Randomly generate matrix of weights

2. Get both positive and negative SIFT descriptors (also create label vector, 1 being positive, -1 being negative)

Finding the other columns of visual bits

Use AdaBoost for first visual bit system



3. Initialize distribution: $D_1(i) = \frac{1}{m}, i = 1, \dots, m.$ where m is ~5000 best weights best threshold

4. Find the best weights and threshold that minimize the error with respect to the distribution:

$$\epsilon_j = \sum_{i=1}^m D_t(i) [y_i \neq h_j(x_i)]$$

Finding the other columns of visual bits

5. Update the distribution according to: $D_{t+1}(i) = \frac{D_t(i) e^{-\alpha_t y_i h_t(x_i)}}{Z_t}$ where: $\alpha_t = \frac{1}{2} \ln \frac{1 - \epsilon_t}{\epsilon_t}$

 ϵ_t is the error rate Z_t is a normalization factor

This is basically saying that if we incorrectly classified one of the descriptors, then we add some value to the corresponding element in the distribution in order to make it more important for future rounds 6. Find new matrix of random weights and repeat the process for ~200 rounds



Studied boosting in general

Implemented AdaBoost

Plan

- □ Talk to Dr. Sukthankar today
- Implement other classes and finish the training part of the visual bits system
- Start on the testing part of visual bits system