

Project 5: Strawberry Pixel Classification Using Pattern Classifier

Each group should

- Submit one report per team containing procedures and results of this project by 11:59 pm, March 9.
- Include a thoughtful, reflective paragraph from each of the team members summarizing what has been learned.
- Attach your well-commented code to the report.

In project 4, Part A, you examined color distributions for strawberry and non-strawberry pixels from 20 images. They will be used as training data for strawberry-pixel classification in this project. Classifiers will be built and tested on images in folder PartC.

1. Choose any one color component.
2. Perform strawberry classification using *Nearest Class Mean Classifier*. Show results on at least three of the test images. Evaluate the results.
3. Perform strawberry classification using *k-Nearest Neighbor Classifier*. You will choose the best k . Show results on at least three of the test images. Evaluate the results.
4. Perform skin classification using *Bayes' Classifier*. Here assume class conditional densities are Gaussian. Write your own code to compute the mean and variance and plot the densities. Show results on at least three of the test images. Evaluate the results.
5. Repeat Steps 2-4 for any *two* color components (i.e., use a two-dimensional feature vector for each pixel). In this case, the bivariate Gaussian density will be described by the mean vector and the covariance matrix.
6. Repeat Steps 2-4 for any *three* color components (i.e., use a three-dimensional feature vector for each pixel). In this case, no graphical representation of the density is needed.
7. Based on the results you obtained above, determine the best color component(s) and the best classifier in strawberry pixel classification.