# AI3604 – Computer Vision
# Fall 2022
# Homework #2
# Due: 11:59 PM, Saturday, December 3, 2022

In this assignment, you will need to realize the basic function of bag-of-features and then train a model for image classification task.

The dataset : Caltech-101. You can download it at : **https://jbox.sjtu.edu.cn/l/w1YYyD**

1. Bag-of-feature is a method which extracts features from an image. It can be realized following the following 4 steps:

   a) 1. Extract features

   b) 2. Learn “visual vocabulary”

   c) 3. Quantize features using visual vocabulary

   d) 4. Represent images by frequencies of “visual words”

   You are expected to use SIFT in (a) and Kmeans in (b).

2. Use the features of the training samples extracted by BOF and the corresponding labels to train a model for image classification. Here, we recommend SVM as the classifier, and you can also choose other classifiers.

3. Evaluate your model with the metric of accuracy.

4. **There are total 5 TODOs in the main.py.**

Other details:

1. You are expected to use 70% of the dataset for training and other for testing.

2. Please hand in your code and report together.

3. The point is how you implement this function rather than how much accuracy the model achieves. It is better to analyze the reasons for the performance of the model you trained.

4. It is better for you to write a report with at most 3 pages. Do not “juan”, because we are anti-juan fighters.

5. Considering you are under huge pressure recently, this assignment is really simple compared with the one last year. Please take it carefully.