Project 1 – Local Feature Detection & Descriptors

- **Key Point Detector**
  - **Implement** one or more keypoint detectors
  - **Compare** their performance (with your own or with your classmate's detector)
    - Harris, LOG, SIFT, DNN-based detector (SuperPoint) etc.
  - **Show response maps**
  - **Show the strongest 250 and 500 interest points** with different suppression radius
- **Key Point Descriptor**

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- **Key Point Detector**
- **Key Point Descriptor**
  - **Implement** one or more descriptors (steered to local scale and orientation)
  - Compare their performance
  - Options
    - Contrast-normalized patches (Brown, Szeliski, and Winder 2005)
    - SIFT (Lowe 2004)
    - GLOH (Mikolajczyk and Schmid 2005)
    - CNN features
    - Any other descriptors

Code and Report Due on Oct. 20

Sample code

```
def harris_response(img,sigma):
    "fill in your code"

    return response

def get_harris_points(response,threshold=0.5):
    corner_threshold = response.max()*threshold
    response_t = response*(response>corner_threshold)

    return response_t

def maxSupression(response,im_size,pad):
    "fill in your code"

    return keypoints
```

Sample image

Project 1 – Local Feature Detection & Descriptors

- Write your report in English
- Send your code and report to TA before Oct. 20
  - **Kai Cheng, chengkai21@mail.ustc.edu.cn**

Code and Report Due on Oct. 20

Samples:

- Write your report in **English**
- **Show intermediate results**
- Some examples