COMPUTER VISION - FINAL EXAM REVIEW OUTLINE

1. **Recognition with local characteristics**
   - **SIFT (theory)**
     - **Parameters**: low-constrast extrema, edge-like extrema. Try to understand and explain these parameters. You can find the explanation.
     - **Descriptor**: try to understand and explain SIFT descriptor for each keypoint. For example: HOG for each block; How many blocks, etc.
   - **Homography (theory):**
     - How to determine homography matrix.
     - Something relates to cv2.findHomography. Please focus on 2 parameters: RANSAC and *ransacReprojThreshold*.

2. **Classification**
   - **HOG (theory)**
     - Steps to calculate HOG: 5 steps.
     - Try to understand and compute gradient, magnitude.
     - Quá trình tạo vector HOG trên ảnh 64x128
   - **SVM (theory)**
     - Parameter C (trade-off between emperical and theory error in SVM)
   - **Implementation**: code to detect pedestrians in an image/video.

3. **Motion & Optical Flow**
   - **Lucas-Kanade (theory)**
     - Optical flow equation (Brightness Constancy Equation)
     - Motrion Vector
     - Windowed Intensity Values→ n linear equations (local window with n pixels) → Over-determined issue → Least squares fitting to obtain the two-equation-two-unknown problem.
   - **Lucas-Kanade (implementation)**
     - Speed estimation.
     - Object Tracking