CSE252C: Quiz 0

This quiz is meant for knowing your background of computer vision. It won't be graded.

First Name *
Manmohan

Last Name *
Chandraker

UCSD PID *
CSE 252C, SP20

Features

(a) What is an interest point? *
A keypoint that can be stably, reliably and repeatedly localized in an image.
(b) What is a descriptor? *

A representation (usually a vector) that encodes identifiable and matchable information for a keypoint.

(c) What kind of histograms are constructed by SIFT? *

Histograms of gradient orientations.

(d) State two transformations to which SIFT is invariant. *

Scale, translation, in-plane rotation.

(e) Rate your confidence *

- 1: Sifted my memory, but nothing.
- 2: I kind of know, but not sure.
- 3: My most Instagram-worthy feature

Geometry

Suppose you are given two views of a scene, V and V'.

(a) For point $x$ in $V$, on what line is the corresponding point $x'$ in $V'$?

Epipolar line.

(b) What is the “fundamental” constraint that $x$ and $x'$ satisfy?

$x'^T F x = 0.$

(c) What is the rank of the fundamental matrix?

2.

(d) What technique can you use for model fitting with outliers?

RANSAC.

(e) Rate your confidence

- 1: Some fundamental doubts
- 2: I kind of know, but not sure.
- 3: Fitting well!

Neural Networks
(a) What is a fully-connected layer?  *

Each unit connected to all units of preceding layer.

(b) What properties make convolutions effective in a CNN?  *

Local connectivity, weight sharing.

(c) Why is stochastic gradient descent used to train CNNs?  *

Gradient computation is expensive for large-scale dataset.

(d) What architectural choice makes a ResNet effective?  *

Skip connections to avoid vanishing gradients.

(e) Rate your confidence  *

- 1: Rather convoluted
- 2: I kind of know, but not sure.
- 3: Skipping with joy!