SuperPoint: Self-Supervised Interest Point Detection and Description

**Goal:** The goal is to implement a self-supervised fully convolutional neural network for interest point detection and description [1]

**Description:**

This project is to implement a self-supervised framework for training interest point detectors and descriptors suitable for a large number of multiple-view geometry problems in computer vision. As opposed to patch-based neural networks, this fully-convolutional model operates on full-sized images and jointly computes pixel-level interest point locations and associated descriptors in one forward pass. We introduce Homographic Adaptation, a multi-scale, multi-homography approach for boosting interest point detection repeatability and performing cross-domain adaptation (e.g., synthetic-to-real). Our model, when trained on the MS-COCO generic image dataset using Homographic Adaptation, is able to repeatedly detect a much richer set of interest points than the initial pre-adapted deep model and any other traditional corner detector. The final system gives rise to state-of-the-art homography estimation results on HPatches when compared to LIFT, SIFT and ORB.


**Recommended:** Python and prior knowledge in machine learning

**Supervisor:**

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