# HPatches summary

1. They evaluate descriptors
2. They have provided a dataset to preform evaluation on matching, retrieval and verification.
3. Normalizing traditional descriptors improves their performance many folds.
4. Learned descriptors work well with only those datasets used to train them and not in general. Hence our goal is to fit those descriptors with other datasets.
5. SIFT is the most used technique. Current developments in benchmarks and evaluation techniques aren’t good enough.
6. The following factors need to be considered:
   * 1. Data diversity
     2. Reproducibility and fairness of comparisons
     3. Task diversity
7. **Review of existing benchmarks**
   * + 1. Image based benchmarks from the various reference papers are evaluated
       2. Common shortcoming found:

No pre-defined set of regions to be matched. Hence results depend on the method, implementation and parameters of descriptors. This makes the comparison unreliable.

* + - 1. To keep this ambiguity in check, they proposed that descriptor benchmarks should be used in patches of images instead of whole images.

1. **Rules for using patch-based benchmarks**

Patches are extracted from interest point locations.

Then geometric transformations are carried out,

1. **Evaluation summary of benchmarks**

Photo-tourism dataset isn’t diverse and uses only patch verification.

The CVDS dataset is very complex and diverse, yet descriptors show high performance on it.

The RomePatches dataset uses a query ranking task

1. **Metrics**

Area under Receiver Operating Curves (ROC) is used as a deciding factor for balanced data.

For unbalanced datasets, some papers have used just one point under the curve as a metric. However, that isn’t very accurate. The best methods are Precision Recall and mean Average Precision for unbalanced data.

1. New dataset – Hpatches introduced keeping in mind the following properties
   * + 1. Reproducible/ Patch-based
       2. Diverse
       3. Real
       4. Large
       5. Multitask
2. **Images and Patches**