Retrieval 图像检索

Classical Local Feature

Object retrieval with large vocabularies and fast spatial matching	**CVPR 2007**
Visual Categorization with Bags of Keypoints	ECCV 2004
ORB: an efficient alternative to SIFT or SURF	ICCV 2011
Object Recognition from Local Scale-Invariant Features	ICCV 1999
Total Recall: Automatic Query Expansion with a Generative Feature Model for Object Retrieval	ICCV 2007
Three things everyone should know to improve object retrieval	CVPR 2012
On-the-fly learning for visual search of large-scale image and video datasets	
All about VLAD	CVPR 2013
Aggregating localdescriptors into a compact image representation	CVPR 2010
More About VLAD: A Leap from Euclidean to Riemannian Manifolds	
Hamming embedding and weak geometric consistency for large scale image search	
Revisiting the VLAD image representation,project	
Improving the Fisher Kernel for Large-Scale Image Classification	ECCV 2010
Image Classification with the Fisher Vector: Theory and Practice	
Democratic Diffusion Aggregation for ImageRetrieval	
A Vote-and-Verify Strategy for Fast Spatial Verification in Image Retrieval	ACCV 2016
Triangulation embedding and democratic aggregation for image search	
Efficient Large-scale Image Search With a Vocabulary Tree,code	

Deep Learning Feature (Global Feature)

- Smooth-AP: Smoothing the Path Towards Large-Scale Image Retrieval, ECCV 2020
- SOLAR: Second-Order Loss and Attention for Image Retrieval, ECCV 2020.
- Unifying Deep Local and Global Features for Image Search, arxiv 2020.
- SOLAR: Second-Order Loss and Attention for Image Retrieval, arxiv 2020.
- A Benchmark on Tricks for Large-scale Image Retrieval, arxiv 2020。
- Learning with Average Precision: Training Image Retrieval with a Listwise Loss, ICCV 2019。
- MultiGrain: a unified image embedding for classes and instances, arxiv 2019.
- Deep Image Retrieval:Learning Global Representations for Image search
- End-to-end Learning of Deep Visual Representations for Image retrieval, DIR更详细的论文说明
- What Is the Best Practice for CNNs Applied to Visual Instance Retrieval?, 关于layer选取的问题
- Bags of Local Convolutional Features for Scalable Instance Search
- Faster R-CNN Features for Instance Search

- Cross-dimensional Weighting for Aggregated Deep Convolutional Features,project
- Class-Weighted Convolutional Features for Image Retrieval
- Multi-Scale Orderless Pooling of Deep Convolutional Activation Features, VLAD coding
- Aggregating Deep Convolutional Features for Image Retrieval,论文笔记,基于深度学习的视觉实例搜索研究进展.
- Particular object retrieval with integral max-pooling of CNN activations,project
- Particular object retrieval using CNN
- Learning to Match Aerial Images with Deep Attentive Architectures.
- Siamese Network of Deep Fisher-Vector Descriptors for Image Retrieval
- Combining Fisher Vector and Convolutional Neural Networks for Image Retrieval, fv和cnn特征融合提升
- Selective Deep Convolutional Features for Image Retrieval
- Class-Weighted Convolutional Features for Image Retrieval
- Towards Good Practices for Image Retrieval Based on CNN Features
- Fine-tuning CNN Image Retrieval with No Human Annotation
- An accurate retrieval through R-MAC+ descriptors for landmark recognition
- Regional Attention Based Deep Feature for Image Retrieval,code, BMVC 2018.
- Detect-to-Retrieve: Efficient Regional Aggregation for Image Search, arxiv.
- Revisiting Oxford and Paris: Large-Scale Image Retrieval Benchmarking,project, CVPR 2018.
- Guided Similarity Separation for Image Retrieval, NeurIPS 2019.

Deep Learning Feature (Local Feature)

- DISK: Learning local features with policy gradient, arxiv 2006.13566.
- D2D: Keypoint Extraction with Describe to Detect Approach, arxiv 2020.
- UR2KiD: Unifying Retrieval, Keypoint Detection, and Keypoint Description without Local Correspondence Supervision, arxiv.
- Visualizing Deep Similarity Networks.
- Combination of Multiple Global Descriptors for Image Retrieval.
- Beyond Cartesian Representations for Local Descriptors,code, ICCV 2019.
- R2D2: Reliable and Repeatable Detector and Descriptor,R2D2, NeurIPS 2019.
- SOSNet: Second Order Similarity Regularization for Local Descriptor Learning, CVPR 2019.
- Local Features and Visual Words Emerge in Activations, CVPR 2019.
- Explicit Spatial Encoding for Deep Local Descriptors, CVPR 2019.
- Key.Net: Keypoint Detection by Handcrafted and Learned CNN Filters, ICCV 2019.
- Learning Discriminative Affine Regions via Discriminability,affnet
- A Large Dataset for Improving Patch Matching,PS-Dataset
- Working hard to know your neighbor's margins: Local descriptor learning loss,hardnet
- MatchNet: Unifying Feature and Metric Learning for Patch-Based Matching,matchnet
- LF-Net: Learning Local Features from Images, NeurIPS 2018.
- Local Descriptors Optimized for Average Precision, CVPR 2018
- SuperPoint: Self-Supervised Interest Point Detection and Description, Magic Leap
- GeoDesc: Learning Local Descriptors by Integrating Geometry Constraints,code, ECCV 2018.
- Learning local feature descriptors with triplets and shallow convolutional neural networks, BMVC 2016.

Cross Model Retrieval (Cross Model Retrieval)

- Composing Text and Image for Image Retrieval - An Empirical Odyssey

ANN search

- Accelerating Large-Scale Inference with Anisotropic Vector Quantization,blog,code, ICML 2020.
- Improving Approximate Nearest Neighbor Search through Learned Adaptive Early Termination, SIGMOD 2020.
- RobustiQ A Robust ANN Search Method for Billion-scale Similarity Search on GPUs, ICMR 2019.
- Zoom: Multi-View Vector Search for Optimizing Accuracy, Latency and Memory
- Vector and Line Quantization for Billion-scale Similarity Search on GPUs
- GGNN: Graph-based GPU Nearest Neighbor Search, arxiv 2019.
- Learning to Route in Similarity Graphs, ICML 2019.
- Practical and Optimal LSH for Angular Distance
- pq-fast-scan
- faiss. A library for efficient similarity search and clustering of dense vectors.
- Polysemous codes
- Optimized Product Quantization
- lopq. Training of Locally Optimized Product Quantization (LOPQ) models for approximate nearest neighbor search of high dimensional data in Python and Spark.
- nns_benchmark. Benchmark of Nearest Neighbor Search on High Dimensional Data.
- Optimized Product Quantization
- Falconn. FAst Lookups of Cosine and Other Nearest Neighbors.
- Annoy. Approximate Nearest Neighbors in C++/Python optimized for memory usage and loading/saving to disk
- NMSLIB. Non-Metric Space Library (NMSLIB): A similarity search library and a toolkit for evaluation of k-NN methods for generic non-metric spaces.
- Efficient and robust approximate nearest neighbor search using Hierarchical Navigable Small World graphs, graph-based method.
- Fast Approximate Nearest Neighbor Search With Navigating Spreading-out Graphs,code
- Efficient Nearest Neighbors Search for Large-Scale Landmark Recognition
- NV-tree: A Scalable Disk-Based High-Dimensional Index
- Dynamicity and Durability in Scalable Visual Instance Search
- Revisiting the Inverted Indices for Billion-Scale Approximate Nearest Neighbors, code
- Link and code: Fast indexing with graphs and compact regression codes
- A Survey of Product Quantization, 对于矢量量化方法一篇比较完整的调研，值得一读
- GeoDesc: Learning Local Descriptors by Integrating Geometry Constraints, 学习局部特征的descriptor, 匹配能力较强

- Learning a Complete Image Indexing Pipeline, CVPR 2018
- spreading vectors for similarity search, ICLR 2019.
- SPTAG: A library for fast approximate nearest neighbor search. Microsoft.

Retrieval Attack

- Open Set Adversarial Examples

Retrieval rank

- Fast Spectral Ranking for Similarity Search,code, CVPR 2018

Retrieval in Industry

- Videntifieris a visual search engine based on a patented large-scale local feature database,demo, based on SIFT feature and NV-tree.
- Web-Scale Responsive Visual Search at Bing
- Visual Search at Alibaba
- Visual Search at Pinterest
- Visual Discovery at Pinterest
- Learning a Unified Embedding for Visual Search at Pinterest, KDD 2019.
- Visual Search at ebay
- Deep Learning based Large Scale Visual Recommendation and Search for E-Commerce,project
- 微信「扫一扫识物」 的背后技术揭秘
- 揭秘微信「扫一扫」识物为什么这么快?

Retrieval Competition and Challenge

- Google Landmark Retrieval Challenge, 2018
- Alibaba Large-scale Image Search Challenge, 2015
- Pkbigdata image retrieval, 2015
- Large-scale Landmark Retrieval/Recognition under a Noisy and Diverse Dataset,Landmark2019-1st-and-3rd-Place-Solution.

Retrieval for Duplicate(copy) detection

A Robust and Fast Video Copy Detection System Using Content-Based Fingerprinting

Feature Fusion

Feature fusion using Canonical Correlation Analysis

Instance Matching

- AdaLAM: Revisiting Handcrafted Outlier Detection, arxiv 2006.04250.
- Graph-Cut RANSAC,code
- Image Matching Benchmark
- GMS: Grid-based Motion Statistics for Fast, Ultra-robust Feature Correspondence
- A Vote-and-Verify Strategy for Fast Spatial Verification in Image Retrieval
- CODE: Coherence Based Decision Boundaries for Feature Correspondence
- Robust feature matching in 2.3s
- PopSift is an implementation of the SIFT algorithm in CUDA
- openMVG robust_estimation
- Neural-Guided RANSAC: Learning Where to Sample Model Hypotheses.
- Homography from two orientation- and scale-covariant features,code.

Semantic Matching

End-to-end weakly-supervised semantic alignment

Template Matching

QATM: Quality-Aware Template Matching For Deep Learning, CVPR 2019.

Image Identification

Image Identification Using SIFT Algorithm: Performance Analysis against Different Image Deformations

Tutorials

- PyRetri, Open source deep learning based image retrieval toolbox based on PyTorch.
- How to Apply Distance Metric Learning to Street-to-Shop Problem
- Recent Image Search Techniques
- Compact Features for Visual Search
- multimedia-indexing. A framework for large-scale feature extraction, indexing and retrieval.
- Image Similarity using Deep Ranking,code.
- Triplet Loss and Online Triplet Mining in TensorFlow
- tf_retrieval_baseline.

Demo and Demo Online

- Visual Image Retrieval and Localization, SIFT feature encoded by BOW.
- VGG Image Search Engine, SIFT feature encoded by BOW.
- SoTu, A flask-based Retrieval system.
- yisou, A flask-based painting Retrieval system, the search algorithm is designed byYong Yuan.

Datasets

- DeepFashion2 Dataset, DeepFashion2 is a comprehensive fashion dataset.

Useful Package

VLFeat
Yael