

# Learn to Hash

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## Introduction

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## Categories

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### Data-Independent Method

- Similarity Search in High Dimensions via Hashing [[paper](#)]
  - Aristides Gionis, Piotr Indyk and Rajeev Motwani. [VLDB], 1999.
- Near-optimal hashing algorithms for approximate nearest neighbor in high dimensions. [[paper](#)]
  - Alexandr Andoni and Piotr Indyk. [ACM] 2008.
- Locality-Sensitive Hashing Scheme Based on p-Stable Distributions [[paper](#)]
  - Datar et al. [ACM], 2004.
- Kernelized Locality-Sensitive Hashing for Scalable Image Search [[paper](#)]
  - Brian Kulis and Kristen Grauman. [ICCV], 2009.
- Fast Similarity Search for Learned Metrics [[paper](#)]
  - Prateek Jain, Brian Kulis and Kristen Grauman. [TPAMI], 2009.
- Locality-Sensitive Binary Codes from Shift-Invariant Kernels [[paper](#)]
  - Maxim Raginsky and Svetlana Lazebnik. [NIPS], 2009.

### Data-Dependent Method

#### Unsupervised Hashing

- Spectral Hashing (SH) [[paper](#)][[code](#)]
  - Yair Weiss, Antonio Torralba and Rob Fergus. [NIPS], 2008
- Hashing with Graphs (AGH) [[paper](#)][[code](#)]
  - Wei Liu, Jun Wang, Sanjiv Kumar and Shih-Fu Chang. [ICML], 2010
- Iterative quantization: A procerustean approach to learning binary codes (ITQ) [[paper](#)][[code](#)]
  - Yunchao Gong and Svetlana Lazebnik. . [CVPR], 2011
- Isotropic Hashing (IsoHash) [[paper](#)][[code](#)]
  - Weihao Kong and Wu-Jun Li. [NIPS], 2012
- Spherical Hashing (SPH) [[paper](#)][[C++ code](#)][[matlab code](#)][[slide](#)]
  - Jae-Pil Heo, Youngwoon Lee, Junfeng He, Shih-Fu Chang and Sung-Eui Yoon. [CVPR], 2012
- Harmonious Hashing (HamH) [[paper](#)]
  - Bin Xu, Jiajun Bu, Yue Lin Chun Chen, Xiaofei He and Deng Cai. [IJCAI], 2013
- Complementary Projection Hashing (CPH) [[paper](#)]
  - Zhongming Jin, Yao Hu, Yue Lin, Debing Zhang, Shiding Lin, Deng Cai and Xuelong Li. [ICCV], 2013
- Inductive Hashing on Manifolds [[paper](#)][[supplementary](#)][[code](#)][[poster](#)]
  - Fumin Shen, Chunhua Shen, Qinfeng Shi, Anton van den Hengel and Zhenmin Tang. [CVPR], 2013
- Learning Binary Codes for High-Dimensional Data Using Bilinear Projections (BPBC) [[paper](#)][[code](#)]
  - Yunchao Gong, Sanjiv Kumar, Henry A. Rowley and Svetlana Lazebnik. [CVPR], 2013
- Discrete Graph Hashing (DGH) [[paper](#)]
  - Wei Liu, Cun Mu, Sanjiv Kumar and Shih-Fu Chang. [NIPS], 2014

- Circulant Binary Embedding (CBE) [[paper](#)][[code](#)][[slide](#)]
  - Felix Xu, Sanjiv Kumar, Yunchao Gong and Shih-Fu Chang. [ICML], 2014
- Locality Linear Hashing for Extracting Non-Linear Manifolds (LLH) [[paper](#)][[supplementary](#)]
  - Go Irie, Zhenguo Li and Xiao-Ming Wu and Shih-Fu Chang. [CVPR], 2014
- Scalable Graph Hashing with Feature Transformation (SGH) [[paper](#)][[code](#)]
  - Qing-Yuan Jiang and Wu-Jun Li. [IJCAI], 2015

## Supervised Hashing

- Semi-supervised Hashing (SSH) [[paper](#)]
  - Jun Wang, Sanjiv Kumar, and Shih-Fu Chang. Semi-supervised hashing for scalable image retrieval. [CVPR], 2010
- Minimal Loss Hashing (MLH) [[paper](#)] [[code](#)]
  - Mohammad Norouzi and David M. Blei. Minimal loss hashing for compact binary codes. [ICML], 2011
- Supervised Hashing with Kernels (KSH) [[paper](#)][[code](#)]
  - Wei Liu, Jun Wang, Rongrong Ji, Yu-Gang

## Ranking-based Hashing

- Hamming Distance Metric Learning (HDML) [[paper](#)] [[code](#)]
  - Mohammad Norouzi, David J. Fleet, Ruslan Salakhutdinov. [NIPS], 2012
- Learning Hash Functions Using Column Generation (CGH) [[paper](#)][[code](#)]
  - Xi Li, Guosheng Lin, Chunhua Shen, Anton van den Hengel, Anthony Dick. [ICML], 2013
- Order preserving Hashing for Approximate Nearest Neighbor Search (OPH) [[paper](#)]
  - Jianfeng Wang, Jingdong Wang, and Nenghai Yu, Shipeng Li. [ACM MM], 2013
- Learning Hash Codes with Listwise Supervision (RSH) [[paper](#)]
  - Jun Wang, Wei Liu, Andy X. Sun, Yu-Gang Jiang. [ICCV], 2013
- Optimizing Ranking Measures for Compact Binary Code Learning (StructHash) [[paper](#)]
  - Guosheng Lin, Chunhua Shen, Jianxin Wu. [ECCV], 2014
- Ranking Preserving Hashing for Fast Similarity Search (RPH) [[paper](#)]
  - Qifan Wang, Zhiwei Zhang, Luo Si. [IJCAI], 2015

## Multimodal Hashing

- Composite Hashing with Multiple Information Sources (CHMIS-AW) [[paper](#)]
  - Zhang et al. [ACM SIGIR], 2011
- Learning hash functions for cross-view similarity search (CVH) [[paper](#)]
  - Kumar and Udupa. [IJCAI], 2011
- Co-Regularized Hashing for Multimodal Data (CRH) [[paper](#)]
  - Zhen and Yeung. [NIPS], 2012
- Inter-Media Hashing for Large-Scale Retrieval from Heterogeneous Data Sources (IMH) [[paper](#)]
  - Song et al.. [SIGMOD], 2013
- Comparing apples to oranges: a scalable solution with heterogeneous hashing (RaHH) [[paper](#)]
  - Ou et al. [KDD], 2013
- Large-scale supervised multimodal hashing with semantic correlation maximization (SCM) [[paper](#)][[code](#)]
  - Zhang and Li. [AAAI], 2014
- Collective Matrix Factorization Hashing for Multimodal data (CMFH) [[paper](#)]
  - Ding et al. [CVPR], 2014
- Quantized correlation hashing for fast cross-modal search (QCH) [[paper](#)]
  - Wu et al. [IJCAI], 2015
- Semantic Topic Multimodal Hashing for Cross-Media Retrieval (STMH) [[paper](#)]
  - Wang et al. [IJCAI], 2015
- Semantics-Preserving Hashing for Cross-View Retrieval (SePH) [[paper](#)]
  - Lin et al. [CVPR], 2015

## Deep Hashing

- Supervised Hashing via Image Representation Learning (CNNH) [[paper](#)][[code](#)][[slide](#)]
  - Rongkai Xia, Yan Pan, Hanjiang Lai, Cong Liu, and Shuicheng Yan. [AAAI], 2014
- Bit-Scalable Deep Hashing With Regularized Similarity Learning for Image Retrieval and Person Re-Identification (DRSCH) [[paper](#)][[code](#)]
  - Ruimao Zhang, Liang Lin, Rui Zhang, Wangmeng Zuo, and Lei Zhang. [TIP], 2015
- Convolutional Neural Networks for Text Hashing (THC) [[paper](#)]
  - Jiaming Xu, Peng Wang, Guanhua Tian, Bo Xu, Jun Zhao, Fangyuan Wang, Hongwei Hao. [IJCAI], 2015
- Simultaneous Feature Learning and Hash Coding with Deep Neural Networks (NINH) [[paper](#)]
  - Hanjiang Lai, Yan Pan, Ye Liu, and Shuicheng Yan. [CVPR], 2015
- Deep Semantic Ranking Based Hashing for Multi-Label Image Retrieval (DSRH) [[paper](#)][[code](#)]
  - Fang Zhao, Yongzhen Huang, Liang Wang, and Tieniu Tan. [CVPR], 2015
- Deep Hashing for Compact Binary Codes Learning (DH) [[paper](#)]
  - Venice Erin Liong, Jiwen Lu, Gang Wang, Pierre Moulin, and Jie Zhou. [CVPR], 2015
- Deep Learning of Binary Hash Codes for Fast Image Retrieval (HDS) [[paper](#)][[code](#)][[questions](#)]
  - Kevin Lin, Huei-Fang Yang, Jen-Hao Hsiao, and Chu-Song Chen. [CVPRW], 2015

## Online Hashing

- Online Hashing (OKH) [[paper](#)]
  - Long-kai Huang, Qiang Yang and Wei-Shi Zheng. [IJCAI], 2013
- Online Sketching Hashing (OSH) [[paper](#)]
  - Cong Leng, Jiaxiang Wu, Jian Cheng, Xiao Bai and Hangqing Lu. [CVPR], 2015

## Quantization

- Double-Bit Quantization for Hashing (DBQ) [[paper](#)] [[code](#)]
  - Weihao Kong, Wu-Jun Li. [AAAI], 2012
- Manhattan hashing for large-scale image retrieval (MQ) [[paper](#)] [[code](#)]
  - Weihao Kong, Wu-Jun Li,Minyi Guo. [SIGIR], 2012
- Variable Bit Quantisation for LSH [[paper](#)]
  - Sean Moran, Victor Lavrenko,Miles Osborne. [ACL], 2013
- Hamming Compatible Quantization for Hashing [[paper](#)]
  - Wang et al. Hamming Compatible Quantization for Hashing [IJCAI], 2015

## Dataset

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### MIR-FLICKR

- [[dataset](#)]

### NUS-WIDE

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### CIFAR

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