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#### Abstract

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### 1 Introduction

# 2 Background

## References

- [1] Bogdan Alexe, Thomas Deselaers, and Vittorio Ferrari. "What is an object?" In: *Computer Vision and Pattern Recognition (CVPR), 2010 IEEE Conference on.* IEEE. 2010, pp. 73–80.
- [2] Ricardo Baeza-Yates, Berthier Ribeiro-Neto, et al. *Modern information retrieval*. Vol. 463. ACM press New York, 1999.
- [3] Liefeng Bo, Xiaofeng Ren, and Dieter Fox. "Hierarchical matching pursuit for image classification: Architecture and fast algorithms". In: *Advances in neural information processing systems.* 2011, pp. 2115–2123.
- [4] Oren Boiman, Eli Shechtman, and Michal Irani. "In defense of nearest-neighbor based image classification". In: *Computer Vision and Pattern Recognition*, 2008. CVPR 2008. IEEE Conference on. IEEE. 2008, pp. 1–8.
- [5] Nils Bore, Patric Jensfelt, and John Folkesson. "Finding Frequent 3D structures in Human Environments". In: (2014).
- [6] Björn Browatzki et al. "Going into depth: Evaluating 2D and 3D cues for object classification on a new, large-scale object dataset". In: Computer Vision Workshops (ICCV Workshops), 2011 IEEE International Conference on. IEEE. 2011, pp. 1189–1195.
- [7] Dorin Comaniciu and Peter Meer. "Mean shift: A robust approach toward feature space analysis". In: *Pattern Analysis and Machine Intelligence, IEEE Transactions on* 24.5 (2002), pp. 603–619.
- [8] Navneet Dalal and Bill Triggs. "Histograms of oriented gradients for human detection". In: Computer Vision and Pattern Recognition, 2005. CVPR 2005. IEEE Computer Society Conference on. Vol. 1. IEEE. 2005, pp. 886–893.
- [9] Li Fei-Fei and Pietro Perona. "A bayesian hierarchical model for learning natural scene categories". In: Computer Vision and Pattern Recognition, 2005. CVPR 2005. IEEE Computer Society Conference on. Vol. 2. IEEE. 2005, pp. 524–531.
- [10] Pedro F Felzenszwalb et al. "Object detection with discriminatively trained part-based models". In: *Pattern Analysis and Machine Intelligence, IEEE Transactions on* 32.9 (2010), pp. 1627–1645.
- [11] Bernd Fritzke et al. "A growing neural gas network learns topologies". In: *Advances in neural information processing systems* 7 (1995), pp. 625–632.
- [12] K. Haris et al. "Hybrid image segmentation using watersheds and fast region merging". In: *Image Processing, IEEE Transactions on* 7.12 (1998), pp. 1684–1699.
- [13] Andrew E. Johnson and Martial Hebert. "Using spin images for efficient object recognition in cluttered 3D scenes". In: *Pattern Analysis and Machine Intelligence, IEEE Transactions on* 21.5 (1999), pp. 433–449.
- [14] Michael Kazhdan, Thomas Funkhouser, and Szymon Rusinkiewicz. "Rotation invariant spherical harmonic representation of 3 D shape descriptors". In: *Symposium on geometry processing*. Vol. 6. 2003.

- [15] Kevin Lai et al. "A Scalable Tree-Based Approach for Joint Object and Pose Recognition." In: AAAI. 2011.
- [16] Kevin Lai et al. "Sparse distance learning for object recognition combining rgb and depth information". In: *Robotics and Automation (ICRA), 2011 IEEE International Conference on.* IEEE. 2011, pp. 4007–4013.
- [17] David G Lowe. "Distinctive image features from scale-invariant keypoints". In: *International journal of computer vision* 60.2 (2004), pp. 91–110.
- [18] Krystian Mikolajczyk and Cordelia Schmid. "A performance evaluation of local descriptors". In: *Pattern Analysis and Machine Intelligence, IEEE Transactions on* 27.10 (2005), pp. 1615–1630.
- [19] Krystian Mikolajczyk and Cordelia Schmid. "Scale & affine invariant interest point detectors". In: *International journal of computer vision* 60.1 (2004), pp. 63–86.
- [20] C.A. Mueller, K. Pathak, and A. Birk. "Object recognition in RGBD images of cluttered environments using graph-based categorization with unsupervised learning of shape parts". In: *Intelligent Robots and Systems (IROS), 2013 IEEE/RSJ International Conference on.* 2013, pp. 2248–2255.
- [21] Christian A. Mueller, Paul G. Plöger, and Matthew S. Roscoe. "Towards Scalable 3D Object Shape Categorization". In: *Active Semantic Perception World Workshop on Intelligent Robots and Systems (IROS)* (2012).
- [22] David Nister and Henrik Stewenius. "Scalable recognition with a vocabulary tree". In: Computer Vision and Pattern Recognition, 2006 IEEE Computer Society Conference on. Vol. 2. IEEE. 2006, pp. 2161–2168.
- [23] Robert Osada et al. "Matching 3D models with shape distributions". In: *Shape Modeling and Applications, SMI 2001 International Conference on.* IEEE. 2001, pp. 154–166.
- [24] James Philbin et al. "Object retrieval with large vocabularies and fast spatial matching". In: Computer Vision and Pattern Recognition, 2007. CVPR'07. IEEE Conference on. IEEE. 2007, pp. 1–8.
- [25] Tahir Rabbani, Frank van den Heuvel, and G Vosselmann. "Segmentation of point clouds using smoothness constraint". In: *International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences* 36.5 (2006), pp. 248–253.
- [26] Yong Rui and Thomas Huang. "Optimizing learning in image retrieval". In: *Computer Vision and Pattern Recognition*, 2000. Proceedings. IEEE Conference on. Vol. 1. IEEE. 2000, pp. 236–243.
- [27] Radu Bogdan Rusu et al. "Fast 3d recognition and pose using the viewpoint feature histogram". In: Intelligent Robots and Systems (IROS), 2010 IEEE/RSJ International Conference on. IEEE. 2010, pp. 2155–2162.
- [28] Firooz A. Sadjadi and Ernest L. Hall. "Three-Dimensional Moment Invariants". In: *Pattern Analysis and Machine Intelligence, IEEE Transactions on* PAMI-2.2 (1980), pp. 127–136.
- [29] Kate Saenko et al. "Practical 3-D object detection using category and instance-level appearance models". In: *Intelligent Robots and Systems (IROS), 2011 IEEE/RSJ International Conference on.* IEEE. 2011, pp. 793–800.
- [30] Walter Wohlkinger and Markus Vincze. "Shape-based depth image to 3D model matching and classification with inter-view similarity". In: *Intelligent Robots and Systems (IROS), 2011 IEEE/RSJ International Conference on.* IEEE. 2011, pp. 4865–4870.
- [31] H Woo et al. "A new segmentation method for point cloud data". In: *International Journal of Machine Tools and Manufacture* 42.2 (2002), pp. 167–178.
- [32] MF Zakaria et al. "Fast algorithm for the computation of moment invariants". In: *Pattern Recognition* 20.6 (1987), pp. 639–643.