

OpenCV: A Comprehensive Review and Applications in Computer Vision

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Abstract: Computer vision is a field of study that aims to enable machines to gain an understanding of visual information. OpenCV (Open Source Computer Vision Library) is an open-source computer vision and machine learning software library widely used by researchers and developers worldwide. In this research paper, we provide a comprehensive review of OpenCV, discussing its key features, algorithms, and applications. We explore various components of OpenCV, including image and video processing, object detection and tracking, facial recognition, and machine learning integration. Additionally, we highlight the strengths and limitations of OpenCV and discuss emerging trends and future directions in computer vision research using OpenCV.

Keywords: Computer vision

REFERENCES

- [1]Radhakrishna Achanta, Appu Shaji, Kevin Smith, Aurelien Lucchi, Pascal Fua, and Sabine Susstrunk. Slic super pixels compared to state-of-the-art superpixel methods. *IEEE Trans. Pattern Anal. Mach. Intell.*, 34(11):2274–2282, nov 2012.
- [2]Motilal Agrawal, Kurt Konolige, and Morten Rufus Blas. Censure: Center surround extremas for realtime feature detection and matching. In *Computer Vision–ECCV 2008*, pages 102–115. Springer, 2008.
- [3]Timo Ahonen, Abdenour Hadid, and Matti Pietikäinen. Face recognition with local binary patterns. In *Computer vision-eccv 2004*, pages 469–481. Springer, 2004.
- [4]Cuneyt Akinlar and Cihan Topal. Edlines: A real-time line segment detector with a false detection control. *Pattern Recognition Letters*, 32(13):1633–1642, 2011.
- [5]Cuneyt Akinlar and Cihan Topal. Edpf: a real-time parameter-free edge segment detector with a false detection control. *International Journal of Pattern Recognition and Artificial Intelligence*, 26(01):1255002, 2012.
- [6]Cuneyt Akinlar and Cihan Topal. Edcircles: A real-time circle detector with a false detection control. *Pattern Recognition*, 46(3):725–740, 2013.
- [7]Alexandre Alahi, Raphael Ortiz, and Pierre Vandergheynst. Freak: Fast retina keypoint. In *Computer Vision and Pattern Recognition (CVPR), 2012 IEEE Conference on*, pages 510–517. IEEE, 2012.