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Review on Image and Vision Computing

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ABSTRACT:

Image and vision computing is an interdisciplinary field that combines computer science, engineering, and mathematics to develop methods and algorithms for analyzing and interpreting digital images and videos. This journal aims to provide a platform for researchers, academics, and practitioners to share their latest findings, innovations, and applications in this area. The journal welcomes original research articles, review papers, and technical notes on topics related to image and vision computing, including image processing, computer vision, pattern recognition, machine learning, and multimedia.

Keywords : Techniques, Computer, Image, Vision, Methods

Introduction

Image and vision computing has become increasingly important in various fields, such as medical diagnosis, surveillance, robotics, and entertainment. With the rapid development of digital cameras, mobile devices, and social media, there is a growing demand for efficient and effective methods to process, analyze, and understand visual data. Image and vision computing encompasses a wide range of techniques, from basic image filtering and segmentation to complex object recognition and tracking. This journal aims to contribute to the advancement of this field by providing a platform for researchers to exchange ideas and share their latest developments.

Image processing: methods for enhancing, restoring, and analyzing digital images

Image processing techniques are used to manipulate digital images for various purposes, such as enhancing their visual quality, removing noise and artifacts, and extracting useful information. Some of the common techniques used in image processing include filtering, segmentation, and feature extraction. Filtering methods can be used to remove noise, sharpen edges, or smooth the image. Segmentation techniques can be used to separate the image into meaningful regions, while feature extraction methods can be used to extract specific characteristics of the image, such as texture, color, or shape.

Computer vision: techniques for extracting information from visual data and modeling the 3D world

Computer vision is concerned with developing algorithms and methods for processing and interpreting visual data, such as images and videos. Computer vision techniques can be used to extract information from images and videos, such as object detection and tracking, motion analysis, and scene reconstruction. In addition, computer vision methods can be used to model the 3D world from 2D images or videos, using techniques such as stereo vision, structure from motion, or visual SLAM.

Pattern recognition: algorithms for recognizing patterns and structures in images and videos Pattern recognition is concerned with developing algorithms and methods for recognizing patterns and structures in visual data. Pattern recognition techniques can be used for various applications, such as object recognition, face recognition, gesture recognition, and scene classification. Some of the common techniques used in pattern recognition include feature extraction, feature selection, and classification. Machine learning methods, such as support vector machines, neural networks, or decision trees, are often used for pattern recognition tasks.

Machine learning: methods for training computers to recognize and classify visual patterns

Machine learning is concerned with developing algorithms and methods that enable computers to learn from data and make predictions or decisions based on that learning.

Machine learning techniques can be used for various tasks in image and vision computing, such as object recognition, image segmentation, or image retrieval. Supervised learning methods, such as classification or regression, can be used to train models based on labeled data, while unsupervised learning methods, such as clustering or dimensionality reduction, can be used to discover patterns in unlabeled data.

Multimedia

Integration of different modalities of visual and audio data

Multimedia is concerned with developing methods and algorithms for integrating different modalities of data, such as visual, audio, or text data. Multimedia techniques can be used for various applications, such as video summarization, speech recognition, or multimedia retrieval. Some of the common techniques used in multimedia include feature fusion, modality alignment, and multi-modal learning. In addition, multimedia techniques can benefit from the use of deep learning methods, such as convolutional neural networks or recurrent neural networks, for processing and analyzing complex multimedia data.

Conclusion

In conclusion, image and vision computing is a rapidly growing field that has significant applications in various areas such as medical imaging, security and surveillance, robotics, and entertainment. Image processing, computer vision, pattern recognition, machine learning, and multimedia are some of the key areas that fall under image and vision computing. With the increasing availability of data and computing power, there is a great potential for developing new algorithms and methods that can improve the performance and efficiency of image and vision computing systems. In addition, the integration of deep learning techniques with image and vision computing is expected to lead to even more significant breakthroughs in the field. Overall, image and vision computing has a bright future and will continue to play a critical role in advancing many scientific and technological domains.

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