



(1)

Hiding Data in FLV Video File

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Abstract:

Abstract. Video Frame quality and statistical undetectability are two key issues related to steganography techniques. In this paper, we propose a novel flash video file (.flv file extension) information-embedding scheme in which the embedded information is reconstructed without knowing the original host flash video file. The proposed method presents high rate of information embedding and is robust to lossless and lossy compression. The characteristic of the proposed scheme is to use a weak point in the header information of flash video file to assist compression process. Experimental results have indicated that the method is robust against lossless and lossy compression.

Keywords:

Steganography, FLV, lossless and lossy compression.

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(2)

Poor Quality Watermark Barcodes Image Enhancement

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Abstract:

Abstract. The one dimensional (1D) barcode was developed as a package label that could be swiftly and accurately read by a laser scanner. It has become ubiquitous, with symbologies such as UPC used to label approximately 99% of all packaged goods in the US [1]. The two-dimensional (2D) barcode has improved the information encoded capacity, and it also has enriched the applications of barcode technique. Recently, there are researches dealing with watermark technique on barcode to prevent it from counterfeited or prepensely tampered. The existent methods still have to limit the size of embedded watermark in a relatively small portion. Furthermore, it also needs to utilize original watermark or other auxiliary verification mechanism to achieve the barcode verification. In this paper, we propose a novel watermarking barcode reading enhancement method. The proposed method can fight most of reading challenges of watermarking barcode. Experiments with challenging barcode images show substantial improvement over other state-of-the-art algorithms.

Keywords:

Barcode, digital watermark, barcode verification.

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(3)

SS-SVM (3SVM): A New Classification Method for Hepatitis Disease Diagnosis

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Abstract:

Abstract. In this paper, a new classification approach combining support vector machine with scatter search approach for hepatitis disease diagnosis is presented, called 3SVM. The scatter search approach is used to find near optimal values of SVM parameters and its kernel parameters. The hepatitis dataset is obtained from UCI. Experimental results and comparisons prove that the 3SVM gives better outcomes and has a competitive performance relative to other published methods found in literature, where the average accuracy rate obtained is 98.75%.

Keywords:

Support Vector Machine; Scatter Search; Classification; Parameter tuning

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(4)

Support Vector Machines with Weighted Powered Kernels for Data Classification

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Abstract:

Abstract. Support Vector Machines (SVMs) are a popular data classification method with many diverse applications. The SVMs performance depends on choice a suitable kernel function for a given problem. Using an appropriate kernel; the data are transform into a space with higher dimension in which they are separable by an hyperplane. A major challenges of SVMs are how to select an appropriate kernel and how to find near optimal values of its parameters. Usually a single kernel is used by most studies, but the real world applications may required a combination of multiple kernels. In this paper, a new method called, weighted powered kernels for data classification is proposed. The proposed method combined three kernels to produce a new combined kernel (WPK). The method used Scatter Search approach to find near optimal values of weights, alphas and kernels parameters which associated with each kernel. To evaluate the performance of the proposed method, 11 benchmark are used. Experiments and comparisons prove that the method given acceptable outcomes and has a competitive performance relative to a single kernel and some other published methods

Keywords:

Support Vector Machine, Scatter Search, Classification

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Volume 322 , pp 369-378



(5)

Image Retrieval Based on Content

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Abstract:

Content-based image retrieval systems have become a reliable tool for many image database applications. There are several advantages of image retrieval techniques compared to other simple retrieval approaches such as text-based retrieval techniques. Histogram-based algorithms are considered to be effective for retrieval color images. This paper proposes a content-based image retrieval technique that uses CIE Luv color space, multi-precision (segmentation), and similarity matching. A multi-precision means a certain image is divided into a number of sub-blocks, each with its associated color histogram. Experimental results showed that, spatial distribution information recorded by multi-precision color histograms helps to make similarity matching more precise.

Keywords:

Content-based image retrieval, LUV histogram, multi-precision

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ICGST International Journal on Graphics, Vision and Image Processing , ,



(6)

Projector Calibration Using Passive Stereo and Triangulation

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Abstract:

In the past, 3D shape reconstruction process was based on passive stereo which do not require direct control of any illumination source, instead relying entirely on light. Nowadays, 3D shape reconstruction is based on active stereo which replace one camera with a projector. The projector plays an important part in solving the correspondence problem. It projects coded patterns on the scanned object. By capturing the deformed pattern using cameras, the correspondences between image pixels and projector (columns-rows) can be found easily. To do that, the projector must be calibrated. In this work, the problem of projector calibration is solved by passive stereo and triangulation. Our system consists of two cameras, projector, and planner board. A checkerboard pattern is projected on the board and then captured by the two cameras. Using triangulation, the corresponding 3D points of the projected pattern is computed. In this way, having the 2D projected points in the projector frame and its 3D correspondences (calculated using triangulation) the system can be calibrated using a standard camera calibration method. A data projector has been calibrated by this method and accurate results have been achieved.

Keywords:

Correspondences, projector calibration, 3D reconstruction, triangulation

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(7)

Multi-Bin Search: Improved Large-Scale Content-Based Image Retrieval

Abdelrahman Kamel, Yousef B. Mahdy, Khaled F. Hussain

Abstract:

The challenge of large-scale image retrieval has been recently addressed by many promising approaches. In this work, we propose a new approach that jointly optimizes the search accuracy and time by using binary local image descriptors, such as BRIEF and BRISK, and binary hashing methods, such as Locality Sensitive Hashing (LSH) and Spherical Hashing. We propose a Multi-bin search method that highly improves the retrieval precision of binary hashing methods. Also, we introduce a reranking scheme that increases the retrieval precision, but with a slight increase in search time. Evaluations on the University of Kentucky Benchmark (UKB) dataset show that the proposed approach greatly improves the retrieval precision of recent binary hashing approaches.

Keywords:

Image retrieval, Binary Hashing, Multi-bin search

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(8)

Multi-Bin Search: Improved Large-Scale Content-Based Image Retrieval.

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Abstract:

The challenge of large-scale content-based image retrieval (CBIR) has been recently addressed by many promising approaches. In this work, a new approach that jointly optimizes the search precision and time for large-scale CBIR is presented. This is achieved using binary local image descriptors, such as BRIEF or BRISK, along with binary hashing methods, such as Locality-Sensitive Hashing and Spherical Hashing (SH). The proposed approach, named Multi-Bin Search, improves the retrieval precision of binary hashing methods through computing, storing and indexing the nearest neighbor bins for each bin generated from a binary hashing method. Then, the search process does not only search the targeted bin, but also it searches the nearest neighbor bins. To efficiently search inside targeted bins, a fast exhaustive-search equivalent algorithm, inspired by Norm Ordered Matching, has been used. Also, a result reranking step that increases the retrieval precision is introduced, but with a slight increase in search time. Experimental evaluations over famous benchmarking datasets (such as the University of Kentucky Benchmarking, the INRIA Holidays, and the MIRFLICKR-1M) show that the proposed approach highly improves the retrieval precision of the state-of-art binary hashing methods.

Keywords:

Content-based image retrieval · Multi-Bin search · Binary descriptors · Binary hashing

Published In:

International Journal of Multimedia Information Retrieval (IJMIR) , vol. 3 ,



(9)

Behavior-based features model for malware detection

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Abstract:

The sharing of malicious code libraries and techniques over the Internet has vastly increased the release of new malware variants in an unprecedented rate. Malware variants share similar behaviors yet they have different syntactic structure due to the incorporation of many obfuscation and code change techniques such as polymorphism and metamorphism. The different structure of malware variants poses a serious problem to signature-based detection technique, yet their similar exhibited behaviors and actions can be a remarkable feature to detect them by behavior-based techniques. Malware instances also largely depend on API calls provided by the operating system to achieve their malicious tasks. Therefore, behavior-based detection techniques that utilize API calls are promising for the detection of malware variants. In this paper, we propose a behavior-based features model that describes malicious action exhibited by malware instance. To extract the proposed model, we first perform dynamic analysis on a relatively recent malware dataset inside a controlled virtual environment and capture traces of API calls invoked by malware instances. The traces are then generalized into high-level features we refer to as actions. We assessed the viability of actions by various classification algorithms such as decision tree, random forests, and support vector machine. The experimental results demonstrate that the classifiers attain high accuracy and satisfactory results in the detection of malware variants.

Keywords:

Malware, Dynamic-Analysis, Classification

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(10)

Implementation of neural network for monitoring and prediction of surface roughness in a virtual end milling process of a CNC vertical milling machine

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Abstract:

This paper presents a real time simulation for virtual end milling process. Alyuda NeuroIntelligence was used to design and implement an artificial neural network. Artificial neural networks (ANNs) is an approach to evolve an efficient model for estimation of surface roughness, based on a set of input cutting conditions. Neural network algorithms are developed for use as a direct modeling method, to predict surface roughness for end milling operations. Prediction of surface roughness in end milling is often needed in order to establish automation or optimization of the machining processes. Supervised neural networks are used to successfully estimate the cutting forces developed during end milling processes. The training of the networks is preformed with experimental machining data. The neural network is used to predict surface roughness of the virtual milling machine to analyze and preprocess pre measured test data. The simulation for the geometrical modeling of end milling process and analytical modeling of machining parameters was developed based on real data from experiments carried out using Prolight2000 (CNC) milling machine. This application can simulate the virtual end milling process and surface roughness Ra (μm) prediction graphs against cutting conditions simultaneously. The user can also analyze parameters that influenced the machining process such as cutting speed, feed rate of worktable. Key words: Surface roughness, virtual reality, simulation, surface roughness, virtual end milling process, neural

Keywords:

Key words: Surface roughness, virtual reality, simulation, surface roughness, virtual end milling process, neural network

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(11)

Data augmentation for skin lesion using self-attention based progressive generative adversarial network

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Abstract:

While recent years have witnessed the remarkable success of deep learning methods in automated skin lesion detection systems, there still exists a gap between manual assessment of experts and automated evaluation of computers. The reason behind such a gap is the deep learning models demand considerable amounts of data, while the availability of annotated images is often limited. Data Augmentation (DA) is one way to mitigate the lack of labeled data; however, the augmented images intrinsically have a similar distribution to the original ones, leading to limited performance improvement. To satisfy the data lack in the real image distribution, we synthesize skin lesion images – realistic but completely different from the original ones – using Generative Adversarial Networks (GANs). In this paper, we propose the Self-attention Progressive Growing of GANs (SPGGANs) to generate fine-grained 256×256 skin lesion images for Convolutional Neural Network-based melanoma detection, which is challenging via conventional GANs; difficulties arise due to unstable GAN training with high resolution and a variety of skin lesions in size, shape, and location. In SPGGAN, details can be generated using aggregated information from all feature locations. Moreover, the discriminator can monitor that highly detailed features in distant portions of the image are consistent with each other. Furthermore, the Two-Timescale Update Rule (TTUR) is applied to SPGGAN (SPGGAN-TTUR) to improve stability while generating 256×256 skin lesion images. SPGGAN-TTUR is evaluated on data generation and classification tasks using the HAM10000 dataset. Our results confirm the importance of our proposed GAN-based DA approach for training skin lesion classifiers and indicate that it can lead to statistically significant improvements (p-value

Keywords:

Skin cancer, Generative models, Deep learning, Data augmentation, Data imbalance

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