2013 5th International Conference on Digital Image Processing (ICDIP 2013) Conference Program

With workshop of

ICSEM 2013 & ICBCB 2013

Co-Sponsored by

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Announcement

***ICDIP 2013** will be in the conference proceeding by SPIE, which will be included in SPIE Digital Library and indexed by Ei Compendex and ISI proceeding. However, the indexing time can not be confirmed by the conference committee. The proceeding will be posted to all authors in two-three months after the conference.

Conference e-mail: icdip@vip.163.com

***ICSEM 2013** will be published in the International Journal of Modeling and Optimization (ISSN: 2010-3697 www.ijmo.org), and will be included in the Engineering & Technology Digital Library, and indexed by ProQuest,Google Scholar and Crossref. The attendant can get the conference proceeding on site.

Conference e-mail: icsem@vip.163.com

***ICBCB 2013** will be published in the Journal of Medical and Bioengineering (ISSN:2301-3796 www.jomb.org), which will be included in the Engineering & Technology Digital Library, indexed by Ulrich's Periodicals Directory, Google Scholar, EBSCO, Crossref and Electronic Journals Digital Library.

Conference e-mail: icbcb@iacsit.org

*One excellent presentation will be selected from each session and announced at the end of each session. The author of excellent presentation will be awarded the certificate at the Dinner Banquet.

IACSIT Committee

Onsite Registration: April 21, 2013 (Sunday)

10:00 – 12:30 13:30 - 17:00	Arrival and Registration

Note:
(1) You can also register at any working time during the conference
(2) Certificate of Participation can be collected at the registration counter.
(3) The organizer won't provide accommodation, and we suggest you make an early reservation.
Please get the notification for your paper printed out and it is required when you register on desk.

Presentation Schedule on April 22, 2013(Monday)

Simple Version of Presentation Schedule

April 22 09:00-09:15	Opening Remarks **Venue:** Room 3 (Level 3)			
April 22 09:15-10:00	Plenary speech I **Venue:** Room 3 (Level 3)			
April 22 10:00-10:45	Plenary speech II **Venue:** Room 3 (Level 3)			
April 22 10:45-11:05	Group Photo & Coffee break			
April 22 11:05-11:50	Plenary speech III **Venue:** Room 3 (Level 3)	April 22 11:00-12:40	Session 1–ICDIP 2013 **Venue:** Room 5&6 (Level 3)	
April 22 12:00-13:30	Buffet Lunch **Venue:** Restaurant (Level 23)			
April 22 13:30-15:30	Session 2–ICDIP 2013 **Venue:** Room 3 (Level 3)	Session 3–ICDIP 2013 **Venue:** Room 5&6 (Level 3)		
April 22 15:30-15:50	Coffee break			
April 22 15:40-17:00	Session 4– ICSEM 2013&JCMO **Venue:** Room 3 (Level 3)	April 22 15:50-18:30	Session 6–ICDIP 2013 **Venue:** Room 5&6 (Level 3)	
April 22 17:00-18:30	Session 5– ICBCB 2013 **Venue:** Room 3 (Level 3)			
April 22 19:00-20:00	Dinner banquet **Venue:** Restaurant (Level 23)			

Full Version of the Presentation Schedule

Venue: Room 3 (Level 3)

9:00-09:15	Opening Remarks **Prof. Charles M. Falco** University of Arizona, USA
09:15-10:00	Keynote Speech 1 **Prof. Chin-Chen Chang** Feng Chia University, Taiwan
10:00-10:45	Keynote Speech 2 **Prof. Xudong Jiang** Nanyang Technological University,Singapore
10:40-11:00	Group Photo & Coffee break
11:05-11:50	Keynote Speech 3 **Prof.Yulin Wang** Wuhan University, China

SESSION 1: ICDIP 2013
Venue: Room 5&6, Level 3
Time: 11:00-12:40

Session Chair:

	ICDIP 2013 **12 papers** **Time: 11:00-12:30**
I001	Color image retrieval based on refined edge histograms *Xiaohui Yang, Jiali Liu, Lijun Cai and Dengfeng Li* Henan University, China **Abstract-** Color is an important visual feature of images. However, a major drawback of color histogram is that it will loss spatial information and lead to false retrieval. In this paper, we present a "Back"-shape regional division approach and combine with pyramid histogram of orientated gradients (PHOG) to extract image edge features, termed refined edge histogram (REH). Moreover, the REH descriptor is applied to color image retrieval. Experimental results show that the proposed EDH are suitable for color image retrieval and has higher precision and recall compared to other existing methods.
I009	The mass remote-sensing image data management based on Oracle InterMedia *Zhao Xi'an and Shi Shaowei* University of Civil Engineering and Architecture, Beijing, China **Abstract-** With the development of remote sensing technology, getting the image data more and more, how to apply and manage the mass image data safely and efficiently has become an urgent problem to be solved. According to the methods and characteristics of the mass remote sensing image data management and application, this paper puts forward to a new method that takes Oracle Call Interface and Oracle InterMedia to store the image data, and then takes this component to realize the system function modules. Finally, it successfully takes the VC and Oracle InterMedia component to realize the image data storage and management.
I017	Reconstruction of Bidirectional Predicted Residual for Stereoscopic Video Based on Compressed Sensing *Yu Jueqiong, Wang Shigang, Lu Yuanzhi, Zhang Xiaojun, Lu Xiaojie* College of Communication Engineering, Jilin University **Abstract-** As an effective method applied in video processing, compressed sensing(CS)[1] has gained wide interests. As we known, in traditional methods, if we want to recover a signal accurately from the samples, then the sampling rate has to be at least twice the maximum frequency present in the signal, which known as the Nyquist sampling rate. However, the sampling rate under the framework of compressed sensing can be much lower than the Nyquist sampling rate. As we will see in the remainder of this paper, CS asserts that we can recover certain signals from far few samples or measurements than traditional ways use. So as to save costs and improve efficiency, based on compressed sensing，we propose a reconstruction method for stereoscopic video codec. In our method, sparse residuals obtained by the block-based stereoscopic video processing and bidirectional prediction, are coded and reconstructed based on compressed sensing. Compared with other methods through simulation experiments, the proposed method reduces the sampling rate, and improves the quality of the reconstructed stereoscopic videos.
I030	Adaptive Covariance Matrix for Object Region Representation *Lei Qin, Hichem Snoussi and Fahed Abdallah* Universit é de Technologie de Troyes, France **Abstract-** Region covariance descriptor has been employed in many computer vision applications such as texture classification, object detection and object tracking. It provides a natural way of fusing multiple features based on a set of pixels of a given region. However, the discriminative capacity of covariance descriptor can vary dramatically regarding different combination of feature sets that are fused and thus gives rise to the problem of discriminative feature selection when given a specific application. In this work, we propose a PCA-based feature selection approach in the construction procedure of the

	covariance descriptor. We show that covariance descriptor computed in a minutely-learned subspace can be adaptive to a specific target and thus results in a more compact and potentially more discriminative descriptor. Comparing experiments on real world video sequences demonstrate superior representational ability of the proposed method with respect to the conventional region covariance descriptor.
I031	An Image Fusion Algorithm Based On Double Exposure Enhancing Dynamic Range *Huang Sijie*, *Gong Xueyi, Chen Fansheng* Shanghai Institute of Technical Physics,Chinese Academy of Sciences Abstract- With limited dynamic range, images acquired by ordinary image sensors can not cover all information of the given scenario. In order to acquire a high dynamic range picture which contains both light parts and dark parts, this article presents one method improving dynamic range of images from given scenes by using double exposure. The principle of this algorithm goes as follows: one scene is confronted with two exposures by the same sensor, then image data got from exposure will be used for image fusion to enlarge the dynamic range. As to over-exposure and under-exposure in images, the algorithm enhances the contrast between them and displays both of them. This algorithm can work in a fast speed within 23 ms to fuse two 512*512 images, and can work in high dynamic range circumstances, which means it can adjust essential values according to different scenes to achieve a better fusion.
I034	Use of artificial neural networks in the identification and classification of tomatoes *Zaborowicz M.*, *Boniecki P., Koszela K., Przybył J., Mazur R., Kujawa S., Pilarski K* Poznan University of Life Sciences, Poland Abstract- The project aimed to produce a classification model of neural network that would allow automatic evaluate quality of greenhouse tomatoes. The project used computer image analysis and artificial neural networks. Authors based on the analysis of biological material selected set of features that are describing the physical parameters allowing the quality class identification. Image analysis of tomatoes digital photographs samples allowed to choose characteristics features. Obtained characteristics from the images were used as learning data for artificial neural network.
I035	Computer image analysis in the quality in procedure for selected carrot varieties *Koszela K.*, *Weres J., Boniecki P, Zaborowicz M., Przybył J., Dach J., Pilarski K., Jańczak D.* Poznan University of Life Sciences, Poland Abstract- In our daily lives we often assess our surroundings to classify the situations we encounter. We do so based on the observations we make of our surroundings and information we obtain from other sources, using our knowledge and abilities. While this process is natural to us, if we want to give a similar task to a computer system then we have to take various steps in order to enable our computers to partially emulate the human capacity for observation, learning and making final decisions based on knowledge. As information complexity increases, there is an increasing demand for systems which can recognize and classify the objects presented to them. Recently there has been an increase in interest in application of computer image analysis in various research areas. One of these applications is food quality assessment, which aims to replace traditional instrumental methods. A computer visual system was developed to assess carrot quality, based on a single variety. Characteristic qualities of the variety were chosen to describe a suitable root. In the course of the study, digital photographs of carrot roots were taken, which were used as input data for the assessment performed by a dedicated computer program created as a part of the study.
I052	Integrated of Lossy and Lossless Compression with LSB Insertion Technique in Steganography *Yi-Fei Tan*, *Wooi-Nee Tan, Xiaoning Guo* Multimedia University, Malaysia Abstract- This paper discusses a data hiding application using steganography. The purpose of this paper is to introduce a two phase steganography application that allows the user to first compress the information into ASCII form using our novel compression technique (compression technique utilizing reference points coding[1,2]) then embed the information into the carrier using least significant bit (LSB) algorithms. An additional function to this compression method is that it will also allow the user to first choose whether to compress the information in lossy or lossless format before embedding the information into the carrier. The flexibility of this compression technique will allow the user to hide information with a customizable compression phase. By reducing the size for the hidden message, the required bits to embed the message are lessened, and thus the possibility of human visual detection will also be reduced.
I054	A New Encryption Scheme for Color Images Based on Quantum Chaotic System in Transform Domain *Ahmed A. Abd El-Latif*, *Ning Wang, Jia-Liang Peng, Qiong Li and Xiamu Niu* Harbin Institute of Technology Abstract- This paper presents an efficient image encryption scheme for color images based on quantum chaotic systems. In this scheme, a new substitution/confusion scheme is achieved based on toral automorphism in integer wavelet transform by scrambling only the Y (Luminance) component of low frequency subband. Then, a chaotic stream encryption scheme is accomplished by generating an intermediate chaotic key stream image with the help of quantum chaotic system. Simulation results justify the feasibility of the proposed scheme in color image encryption purpose.
I056	Engineering a Fully GPU-Accelerated H.264 Encoder *Bowei Li* and *Yangdong Steve Deng* Tsinghua University Abstract- H.264/AVC is the most popular video coding standard and playing an essential role in today's Internet based content-delivery businesses. H.264's encoding process is highly computationally expensive due to the integration ofcomplex video coding techniques. As a result, transcoding has become a bottleneck of content-hosting services. Recently, general purpose computing on graphics processing units (GPUs) is rapidly rising asa popular computing model to expedite time-consuming applications. In this paper, we propose a fully GPU-accelerated H.264 encoder. Experimental results show that a 100% speed-up ratio can be achieved.
I057	A novel spatial domain details enhancement and compression algorithm for high dynamic range infrared

	image ***Zhang Jufeng****, Zhang Zhijie, Lei Bo* Huazhong Institute of Electro-Optics-Wuhan National Lab for Optoelectronics *Abstract-* With constraints to the performance of the IR detector, IR image usually has lower visual effect with low contrast and less detailed information. In this paper, a new dynamic range infrared image details enhancement algorithm is studied, using a bilateral filter to extract a base component and a detail component. Then these two components are compressed to fit the display dynamic range and then recombined to obtain the output-enhancement image. This algorithm has solved the problem of ripple phenomenon which exists in the traditional infrared image digital detail enhancement. Finally, the algorithm described in this paper is proved experimentally that can provide better DDE effect.
I060	Object detection based on LHOG feature matching ***Xiaoyuan Huang****, Yupin Luo* Tsinghua University *Abstract-* This paper address the problem of detecting visual objects in images which is a fundamental problem in computer vision. We proposed a method based on matching a sample of object with all sub-windows in the testing images to solve this problem instead of training a classifier to determine the location of visual objects. Local histogram of gradient (LHOG) feature are extracted from the sample image and testing images respectively to describe patterns in the images. Integral image technique are employed to accelerate the process of calculating LHOG feature. Then, we apply PCA to reduce the dimensionality of LHOG feature. Distance between sample image and sub-windows are measured by using cosine angle. Adaptive strategy is used to distinguish the object sub-window from non-object sub-window.

Buffet Lunch **Venue:** Restaurant (Level 23)

SESSION 2: ICDIP 2013
Venue: *Room 3, Level 3*
Time: 13:30-15:30
Session Chair:

	ICDIP 2013 15 papers Time: 13:30-15:30
I038	Identification of selected apple pests, based on selected graphical parameters ***Boniecki P.****, Koszela K., Piekarska-Boniecka H., Nowakowski K., Przybył J., Zaborowicz M., Raba B., Dach J.* Poznan University of Life Sciences, Poland *Abstract-* The aim of this work was a neural identification of selected apple tree orchard pests. The classification was conducted on the basis of graphical information coded in the form of selected geometric characteristics of agrofags, presented on digital images. A neural classification model is presented in this paper, optimized using learning sets acquired on the basis of information contained in digital photographs of pests. In particular, the problem of identifying 6 selected apple pests, the most commonly encountered in Polish orchards, has been addressed. In order to classify the agrofags, neural modelling methods were utilized, supported by digital analysis of image techniques.
I043	Video reconstruction via online compressed sensing ***Feng Yan*** *and Dongfang Chen* Wuhan University of Science and Technology *Abstract-* After analyzing the weakness of traditional video codec methods in processing real time compression of high-speed camera images. This paper designs a video codec method based on online compressed sensing (CS). The coding part uses pseudo-random down-sampling of the two-dimensional fast Fourier transform (2D FFT) to process video frames. Meanwhile, combine approximate message passing (AMP) algorithms and three-dimensional dual-tree wavelet transform (3D DTWT) for offline decoding. Experimental results show that, this method could achieve high signal to noise ratio while simplified the coding process.
I049	The selected examples of the application of computer image analysis in the assessment of environmental quality ***Damian Janczak****, Piotr Lewicki, Robert Mazur, Piotr Boniecki, Jacek Dach, Jacek Przybyl, Maciej Pawlak, Krzysztof Pilarski, Wojciech Czekala* Poznan University of Life Sciences, Poland *Abstract-* The environmental monitoring (EM) is an essential part of protection of the environment, most of the methods of environmental protection based on visual techniques or physico-chemical and biochemical measurements. The

	automation of traditional methods proceeds at an accelerating rate, modern laboratories prefer this type of tools to conduct a more comprehensive assessment and online monitoring. The application of computer image analysis methods in biomonitoring brings to this discipline the opportunity to develop innovative tools that allow for more precise sensitive and quantified assessment of monitored processes. The application of techniques based on computer image processing technology will dominate in the future and very comfortable and intuitive tool for researchers in the study of the components of the environment quality. The article presents some methods of automation the acute toxicity bioassay based on the application of computational methods.
I051	Analysis of Classifiers Performance for Classification of Potential Microcalcification *ARUN KUMAR M N AND H S SHESHADRI* MYSORE UNIVERSITY *Abstract-* Breast cancer is a significant public health problem in the world. According to the literature early detection improve breast cancer prognosis. Mammography is a screening tool used for early detection of breast cancer. About 10–30% cases are missed during the routine check as it is difficult for the radiologists to make accurate analysis due to large amount of data. The Microcalcifications (MCs) are considered to be important signs of breast cancer. It has been reported in literature that 30% - 50% of breast cancer detected radio graphically show MCs on mammograms. Histologic examinations report 62% to 79% of breast carcinomas reveals MCs. MC are tiny, vary in size, shape, and distribution, and MC may be closely connected to surrounding tissues. There is a major challenge using the traditional classifiers in the classification of individual potential MCs as the processing of mammograms in appropriate stage generates data sets with an unequal amount of information for both classes (i.e., MC, and Not-MC). Most of the existing state-of-the-art classification approaches are well developed by assuming the underlying training set is evenly distributed. However, they are faced with a severe bias problem when the training set is highly imbalanced in distribution. This paper addresses this issue by using classifiers which handle the imbalanced data sets. In this paper, we also compare the performance of classifiers which are used in the classification of potential MC.
I061	Top-down Spatiotemporal Saliency Detection using Spectral Filtering *Wanyi Li, Peng Wang, Hong Qiao* Institute of Automation, Chinese Academy of Sciences *Abstract-* A spectral filtering based method for top-down spatiotemporal saliency detection is proposed. The proposed method enables to favor the salient features of the target object needed to pop out. Here a feature vector representing the salient features of the target object is learned online within the first image in which it is detected or initialized manually. The proper scale of the Gaussian kernel for spectral filtering is selected automatically according to the size ratio of the whole image to the target object. Guided by the top-down information, a top-down, target-related saliency map can be built in subsequent images. This enables to focus on the most relevant salient region and can be extended to complicated computer vision tasks. Experiment results demonstrate the effectiveness of the proposed method.
I062	Spatial Correlogram between Codewords: An Effective Representation for Image Classification *Bo-jun Xie, Hui Zhang, Jian Yu* Beijing Jiaotong University *Abstract-* This paper presents a new representation for image classificationbased on spatial correlogramapproach. Spatial correlogram capturesspatial co-occurrences of pairwise codewords. Thisrepresentationaugments traditional bag-of-features model by adding spatial informationinto it andcompresses the information contained in a correlogramwithout loss of discriminative power. For the purpose of increasing classification accuracy, we combine the correlogram with spatial pyramid. In a number of image classification experiments, we find that,the proposed methodreaches good performance and high accuracy.
I065	Image Inpainting Strategy for Kinect Depth Maps *Yao Huimin, Chen Yan, Ge Chenyang* Xi'an Jiaotong University *Abstract-* The great advantage of Microsoft Kinect makes the depth acquisition real-time and inexpensive. But the depth maps directly obtained with the Microsoft Kinect device have absent regions and holes caused by optical factors. The noisy depth maps affect lots of complex tasks in computer vision. In order to improve the quality of the depth maps, this paper presents an efficient image inpainting strategy which is based on watershed segmentation and region merging framework of the corresponding color images. The primitive regions produced by watershed transform are merged into lager regions according to color similarity and edge among regions. Finally, mean filter operator to the adjacent pixels is used to fill up missing depth values and deblocking filter is applied for smoothing depth maps.
I069	A New Combination of Monocular and Stereo Cues for Dense Disparity Estimation *Miao Mao, Kaihuai Qin* Tsinghua University *Abstract-* Disparity estimation is a popular and important topic in computer vision and robotics. Stereo vision is commonly done to complete the task, but most existing methods fail in textureless regions and utilize numerical methods to interpolate into these regions. Monocular features are usually ignored, which may contain helpful depth information. We proposed a novel method combining monocular and stereo cues to compute dense disparities from a pair of images. The whole image regions are categorized into reliable regions (textured and unoccluded) and unreliable regions (textureless or occluded). Stable and accurate disparities can be gained at reliable regions. Then for unreliable regions, we utilize k-means to find the most similar reliable regions in terms of monocular cues. Our paper is simple and effective. Experiments show that our method can generate a more accurate disparity map than existing methods from images with large textureless regions, e.g. snow, icebergs.
I073	Ionogram Trace Enhancement Based on Image Pixel Connectedness *Hongguang Lu, Guangrong Ji, Haiyong Zheng, Zhenwei Zhao, Shaohong He*

	Ocean University of China *Abstract*- This paper proposes a novel idea for ionogram trace enhancement to obtain the "clean" ionogram with real ionospheric echo signals, which is very important for further ionogram interpretation and scaling manually or automatically. Two methods based on ionogram trace pixel connectedness are adopted: max filter and connected components labeling. The experiments show that both methods are feasible and effective, and parameter selection and time complexity of the two methods are analyzed.
I074	Salient Region Detection for Phytoplankton Microscopic Image *Jingjing Chu, Guangrong Ji, Haiyong Zheng, Kun Yu,* **Hongguang Lu** Ocean University of China *Abstract*- IG method is an excellent salient region detection method as its good generality and well-defined boundaries. In this paper, a modified method based on IG method is proposed to generate saliency maps for phytoplankton microscopic images. This method utilizes the characteristics of microscopic image, through Gaussian low-pass filter to attenuate high frequency components corresponding to water stains and dust specks. On the basis of luminance and color used in IG method, saturation is added to determine saliency due to that the saturation of background is lower than that of cells. The experimental results show that the proposed method can not only improve visual effect significantly, but also get higher precision and better recall rates compared with IG method.
I077	Face recognition with partial occlusion *Xiao Luan, Bin Fang, Linghui Liu* Chongqing University *Abstract*- In the present paper, we propose a novel method for face recognition against contiguous occlusion. The general idea is to eliminate the impact of occlusions on the linear regression-based classification (LRC) method. Inspired by the level set methods that can provide smooth and closed contours as segmentation results which fit for the assumption of spatially continuity about occlusion, we show how to use the spatial continuity of pixels to segment the occluded regions. By incorporating the idea of level set based image segmentation into the LRC, the proposed approach is capable of reliably determining the occluded regions and removing them from LRC framework. Extensive experiments on publicly available databases (Extended Yale B and AR) show the efficacy of the proposed approach against different types of occlusion.
I088	Signature Verification with Writing Posture Analysis *Hsu-Yung Cheng and Chih-Chang Yu* National Central University, Taiwan *Abstract*- A video-based handwritten signature verification framework is proposed in this paper. Using a camera as the sensor has the advantage that the entire writing processes can be captured along with the signatures. The main contribution of this work is that writing postures are analyzed to achieve the verification purpose because the writing postures cannot be easily imitated or forged. The proposed system is able to achieve low false rejection rates while maintaining low false acceptance rates for database containing both unskilled and skilled imitation signatures.
I089	A swaying object detection algorithm *Shidong Wang, Jianzhong Rong, Jian Wang* University of Science and Technology of China *Abstract*- Moving object detection is a most important preliminary step in video analysis. Some moving objects such as spitting steam, fire and smoke have unique motion feature whose lower position keep basically unchanged and the upper position move back and forth. Based on this unique motion feature, a swaying object detection algorithm is presented in this paper. Firstly, fuzzy integral was adopted to integrate color features for extracting moving objects from video frames. Secondly, a swaying identification algorithm based on centroid calculation was used to distinguish the swaying object from other moving objects. Experiments show that the proposed method is effective to detect swaying object.
I108	Multi-class Markov Models for JPEG Steganalysis *Hao Zhang, Xijian Ping* Zhengzhou Information Science and Technology Institute *Abstract*- Partially ordered Markov models based features were proposed in very recent years, which were shown to be quite effective in JPEG steganalysis. This paper presents an improvement of the original models. The proposed models here have two new characters. First, they are established on absolute values of coefficients instead of the values themselves. Second, the Markov models for coefficients were classified by comparing JPEG modes, not by directions. Besides, we recommended using Cartesian calibration technique to enhance the corresponding steganalytic features. Experimental results show that our proposed features outperform the original features, as well as some joint density features, in detecting several common steganographic algorithms.
I109	Image Super‐Resolution using DCT Interpolation and sparse learning‐based method *Saulo R. S. Reis and Graça Bressan* University of São Paulo, Brazil *Abstract*- In this paper we present a method for single image super-resolution that use discrete cosine transform (DCT) interpolation and a sparse learning-based super-resolution method. The input low-resolution (LR) image is interpolated using both DCT interpolation and bicubic interpolation methods. The bicubic Interpolated image undergoes a process sparse coding using OMP algorithm. The obtained sparse coefficients are multiplied with high-resolution dictionary generated in the training phase, resulting in the intermediate high-resolution (HR) image. The final HR image is obtained by adding the DCT interpolated image and intermediate HR image. The experimental results demonstrate the effectiveness of the method proposed in terms of PSNR, SSIM and visual quality.

SESSION 3: ICDIP 2013
Venue: Room 5&6, Level 3
13:30-15:30
Session Chair:

	ICDIP 2013 **15 papers** **Time: 13:30-15:30**
I090	Depth Map Geberation from Geometry and Motion *Qianmin Li, Chenyang Ge, Pengju Ren, Huimin Yao* Xi'an Jiaotong University **Abstract-** As the demand for 3DTV keep increasing these years, the conversion from exist 2D videos to 3D ones becomes a new area of research. Depth map generation plays a key point in the process. Two most important clues of depth are geometry of the scene and motion vector. This paper presents an algorithm of depth map generation, which intends to get the depth map combines two aspects of information. Compared to the previous work, our method is improved in finding vanishing point, detect motion vectors, and depth map generation.
I093	Relevance of Useful Visual Words in Object Retrieval *Siyuan Qi, Yupin Luo* Tsinghua University **Abstract-**The most popular methods in object retrieval are almost based on bag-of-words (BOW) which is both effective and efficient. In this paper we present a method use the relations between words of the vocabulary to improve the retrieval performance based on the BOW framework. In basic BOW retrieval framework, only a few words of the vocabulary is useful for retrieval, which are spatial consistent in images. We introduce a method to useful select useful words and build a relevance between these words. We combine useful relevance with basic BOW framework and query expansion as well. The useful relevance is able to discover latent related words which is not exist in the query image, so that we can get a more accurate vector model for retrieval. Combined with query expansion method, the retrieval performance are better and fewer time cost.
I095	3D Hand Pose Estimation using Kinect Enhanced with Recovery Method *Santawat Thanyadit, Suthep Madarasami* King's Mongkut University of Technology Thonburi **Abstract-**We present an improved approach to another previous work1on 3D hand tracking that also uses the Microsoft Kinect sensor. The previous implementation tracks the position, orientation, and full articulation from marker-less visual observations provided by Kinect. As an optimization problem, the objective of hand tracking is to minimize the difference between a hand gesture depth image obtained from Kinect and a hypothesized 3-D hand model. The previous method of1 relied heavily on the best current frame result, skin detection data, and depth data, often resulting in a "lost- track state" with unrecoverable error, especially when the hand moved faster than the per-frame processing speed. To recover from the lost track state, we use the skeleton joint data from Kinect to determine hand position, instead of relying on skin data. This joint data is also used to limit the search range of our Particle Swarm Optimization (PSO), allowing for a more efficient search. Consequently, the fewer generations required to obtain a result enables us to achieve higher frame-rate processing. The computationally intensive step in matching the observed hand depth with the hypothesized hand pose is accelerated using a GPGPU processor. The proposed method also improves reliability by adding a recovery mechanism for quick hand movements, eliminating the need for manual hand position initialization by a user. Our method does not depend on skin color detection and, therefore, avoids errors common in incorrect or extra skin detection. Thus, a user need not hide arm skin by wearing long-sleeve clothing, for example.
I100	Curvelet-based Bilinear Interpolation Method for Low-dose CT *Bo Meng, Huiqin Jiang, Zhanwei Liu, Zhongyong Wang, Yumin Liu* Zhengzhou University **Abstract-**In this paper, a curvelet-based noise suppression bilinear interpolation method for low-dose CT images is proposed. Curvelets provide a multidirectional and multiscale decomposition that has been mathematically shown to represent distributed discontinuities such as edges better than traditional wavelets. Because the traditional linear interpolation results in boundary fuzziness in interpolated images, combined with the advantages of curvelet transform, here we propose a curvelet-based modified bilinear interpolation to improve the accuracy of interpolation. Extensive experiments indicate that the proposed method can effectively improve the quality of the obtained target image based on low-dose CT images and the produced slice image is similar to original slice image.
I101	Optical augmented reality assisted navigation system for neurosurgery teaching and planning *Huiqun Wu, Xingyun Geng, Li Wang, Yuanpeng Zhang, Kui Jiang, Lemin Tang, Guomin Zhou, Jiancheng Dong* Medical School of Nantong University **Abstract**-This paper proposed a convenient navigation system for neurosurgeon's pre-operative planning and teaching with augmented reality (AR) technique, which maps the three-dimensional reconstructed virtual anatomy structures onto a

skull model. This system included two parts, a virtual reality system and a skull model scence. In our experiment, a 73 year old right-handed man initially diagnosed with astrocytoma was selected as an example to vertify our system. His imaging data from different modalities were registered and the skull soft tissue, brain and inside vessels as well as tumor were reconstructed. Then the reconstructed models were overlayed on the real scence. Our findings showed that the reconstructed tissues were augmented into the real scence and the registration results were in good alignment. The reconstructed brain tissue was well distributed in the skull cavity. The probe was used by a neurosurgeon to explore the surgical pathway which could be directly posed into the tumor while not injuring important vessels. In this way, the learning cost for students and patients' education about surgical risks reduced. Therefore, this system could be a selective protocol for image guided surgery(IGS), and is promising for neurosurgeon's pre-operative planning and teaching.

I102	Ant Colony Optimization Image Registration Algorithm based on Wavelet Transform and Mutual Information

Hong Zhang, *Yanfeng Sun, Bing Zhai, Yiding Wang*

Jilin University

*Abstract-*This paper studies on the image registration of the medical images. Wavelet transform is adopted to decompose the medical images because the resolution of the medical image is high and the computational amount of the registration is large. Firstly, the low frequency sub-images are matched. Then source images are matched. The image registration was fulfilled by the ant colony optimization algorithm to search the extremum of the mutual information. The experiment result demonstrates the proposed approach can not only reduce calculation amount, but also skip from the local extremum during optimization process, and search the optimization value.

I106	Embedded mobile farm robot for identification of diseased plants

S.S. Sadistap, B.A. Botre, **Harshavardhan Pandit,** *Chandrasekhar, Adesh Rao*

Birla Institute of Science & Technology, Pilani – K. K. Birla Goa Campus

*Abstract-*This paper presents the development of a mobile robot used in farms for identification of diseased plants. It puts forth two of the major aspects of robotics namely automated navigation and image processing. The robot navigates on the basis of the GPS (Global Positioning System) location and data obtained from IR (Infrared) sensors to avoid any obstacles in its path. It uses an image processing algorithm to differentiate between diseased and non-diseased plants. A robotic platform consisting of an ARM9 processor, motor drivers, robot mechanical assembly, camera and infrared sensors has been used. Mini2440 microcontroller has been used wherein Embedded linux OS (Operating System) is implemented.

I1009	Status Recognition of Isolator Based on SmartGuard

Wanguo Wang, *Binhai Wang, Zhenli Wang, Li Li, Jingjing Zhang, Yibin Li*

Shandong Electric Power Research Institute, Jinan, China

*Abstract-*This paper concerns the method for checking the status of isolators and is applied in the sequence control in smart substation based on SmartGuard--a mobile inspection robot for substations. It can recognize the status of an isolator through analyzing its feature. We could get the homography matrix by using the SIFT feature between the template image and new acquired image, then get the range of isolator, finally recognize the status of isolator by image processing. The experiment of results proved that the method could recognize isolator status effectively. The substation realizes one key sequence control system through this technology based SmartGuard.

I1014	Remote Sensing Image Quality Assessment Based on Fractal Theory

Congli Li , Wenjun Lu, Song Xue , Yongchang Shi

New Star Research Institute of Applied Technology

*Abstract-*Consistency by means of image fractal dimension of the surface fractal dimension is designed and implemented based on fractal theory of image quality assessment method. Classic SSIM algorithm based on research and analysis of the factors affecting the image quality, the quality factor of the fractal, built for the blurred image quality evaluation method. Experiments show that the method of subjective and objective evaluation of the relevance, scientific evaluation of fuzzy image quality.

I1018	Sampling Optimization Method Based on Color Difference Analysis for Printer Characterization

*Liu Juhua, Yi Yaohua, Su Hai, Yuan Yuan,***Miao Minjing**

School of Printing and Packaging, Wuhan University

*Abstract-*A sampling optimization method based on color difference analysis was proposed in this paper. Firstly, three color sets--respectively a super set used to simulate the whole CMYK color space, a test set for characterization accuracy verification and an initial characterization set were defined and created. Secondly, the colorimetric values of test set can be predicted according to the characterization results of the current characterization set. Thirdly, by analyzing the color difference of test set, 10% samples with larger color difference were selected as the larger color difference set to carry on optimization. After that, the samples in the super set which are closest to the larger color difference set were found and added to the characterization set. Finally, cyclic optimization was conducted until the characterization accuracy meets the given requirements. Experimental results showed a significant reduction in the number of samples with an improvement of characterization accuracy.

I1021	Scalable Illumination Robust Face Identification Using Harmonic Representation

Cong Xia, *Jiansheng Chen, Chang Yang, Jing Wang, Jing Liu, Guangda Su, Gang Zhang*

Tsinghua University

*Abstract-*Evaluations of both academic face recognition algorithms and commercial systems have shown that the recognition performance degrades significantly due to the variation of illumination. Previous methods for illumination robust face recognition usually involve computationally expensive 3D model transformations or optimization base reconstruction using multiple gallery face images, making them infeasible in practical large scale face identification applications. In this paper, we propose an alternative face identification framework, in which one image per person is used

	for enrollment as is commonly practiced in real life applications. Several probe images captured under different illumination conditions are synthesized to imitate the illumination condition of the enrolled gallery face image. We assume Lambertian reflectance of human faces and use the harmonic representations of lighting. We demonstrate satisfactory performance on the Yale B database, both visually and quantitatively. The proposed method is of very low complexity when linear facial feature are used, and is therefore scalable for large scale applications.
I1026	**Multi-Region Level Set Image Segmentation Based on Image Energy Separation Model** *Xue-Min Yin, Hong Yan,Yu-Hua Yao, Jian-Ping Guo,Chong-Fa Zhong, Zhe Zhang, Yi Wei* Astronaut Research and Training Center of China *Abstract*-This paper presents a multi-region level set image segmentation method based on image energy separation model. The image feature is extracted by using the image energy decomposition method. We represent the regions by the level set functions with constraint. The coupled Partial Differential Equations (PDE) related to the minimization of the functional are considered through a dynamical scheme. A modified region competition factor is adopted to speed up the cure evolution functions, it also guarantees no vacuum and non-overlapping between the neighbor regions. Several experiments are conducted on both synthetic images and natural image. The results illustrate that the proposed multi-region segmentation method is fast and less sensitive to the initializations.
I2001	**Magnetic Resonance Image Denoising Using Multiple Filters** *Danni Ai, Jinjuan Wang, Yuichi Miwa* Hitachi (China) Research & Development Corporation *Abstract*-We introduced and compared ten denoisingfilters which are all proposed during last fifteen years. Especially, the state-of-art denoisingalgorithms, NLM and BM3D, have attracted much attention. Several expansions are proposed to improve the noise reduction based on these two algorithms. On the other hand, optimal dictionaries, sparse representations and appropriate shapes of the transform's support are also considered for the image denoising. The comparison among variousfiltersis implemented by measuring the SNR of a phantom image and denoising effectiveness of a clinical image. The computational time is finally evaluated.
I2008	**The Design and Implementation of Image Query System Based on Color Feature** *Yao Xu-Dong, Jia Da-Chun , LiLin* Luoyang Institute of Science and Technology *Abstract*-ASP.NET technology was used to construct the B/S mode image query system. The theory and technology of database design, color feature extraction from image, index and retrieval in the construction of the image repository were researched. The campus LAN and WAN environment were used to test the system. From the test results, the needs of user queries about related resources were achieved by system architecture design.
I2013	**Image Deblurring Based Structural Graph and Nonlocal Similarity Regularization** *Fangfang Jiang ,Huahua Chen ,Xueyi Ye* Hangzhou Dianzi University *Abstract*-The distribution of image data points forms its geometrical structure. This structure characterizes the local variation, and provides valuable heuristics to the regularization of image restoration process. However, most of the existing approaches to sparse coding fail to consider this character of the image. In this paper, we address the deblurring problem of image restoration. We analyze the distribution of the input data points. Inspired by the theory of manifold learning algorithm, we build a k-NN graph to character the geometrical structure of the data, so the local manifold structure of the data can be explicitly taken into account. To enforce the invariance constraint, we introduce a patch-similarity based term into the cost function which penalizes the nonlocal invariance of the image. Experimental results have shown the effectiveness of the proposed scheme.

Coffee break *15:30-15:50*

Session 4- ICSEM 2013 and JCMO
Venue: Room 3, Level 3
15:40-17:00
Session Chair:

ICSEM 2013+JCMO 9 papers 15:40-17:00

S008	Research on the Software Development Architecture of Naval Simulation Training Standard Console *XU Jing, XU Ming, and Li Tie* Simulation Training Center, Dalian Naval Academy **Abstract**—A component based Architecture is proposed to meet the requirements of the software development architecture of naval simulation training standard console. The Standard Element Database (SDD) and management system, the Foundation Classes Library (FCL), the Standard Object Model Development Tool(S-OMDT) are developed which make developing simpler and rapid.
S012	The coarticulatory effect of bi-syllabic words in Chinese *Maolin Wang and Shengnan Xiong* College of Chinese Language and Culture, Jinan University **Abstract**—In this study, trans-consonantal vowel-to-vowel coarticulation in Chinese is investigated. The target words are in the form of 'bV1.ba', and the subjects are eight native speakers of standard Chinese. Vowel formants are examined at the onset, middle and offset points of the target vowel. Results show that trans-segmental coarticulation exists in Chinese, especially at the onset point of the target vowel. Coarticulation is more likely to occur on F2, and in Chinese, coarticulatory effect does not extend to the offset point of the vowel.
S015	Research on ADC Model Based on Improved Analytic Hierarchy Process *Guoqing Huang, Pengfei Wang, and **Mingxu Wang*** Zhengzhou College of Information and Engineering **Abstract**—ADC model has been widely used in effectiveness evaluation, and the capability matrix C plays a vital role when building ADC model. Based on the analysis of ADC model, construct the matrix C by the improved Analytic Hierarchy Process (AHP) is proposed. The problems of traditional AHP are analyzed, which exist in the structure of capability matrix C. Then, the approximate degree used to solve the weight of judgment matrix is simulated and analyzed. Based on the analysis and the simulation, the improved AHP is proposed combined with entropy method. The results show that the improved AHP is not only to solve the weight of judgment matrix, but also to solve the difficulty when structuring capability matrix C.
S017	Applications of Machine Learning to Resource Management in Cloud Computing *Chenn-Jung Huang, Yu-Wu Wang, Chih-Tai Guan, **Heng-Ming Chen**, and Jui-Jiun Jian* National Dong Hwa University **Abstract**—There are various significant issues in resource allocation, such as maximum computing performance and the green computing, attract researchers' attentions recently. Therefore, how to accomplish tasks with the lowest cost has become an important issue when the resource on the earth is getting less. The goal of this research is to design a sub-optimal resource allocation system in cloud computing environment. A prediction mechanism is realized by using Support Vector Regressions (SVRs) to estimate the response time in the next measurement period, and the resources are redistributed based on the current status of all virtual machine installed in physical machines. Notably, a resource dispatch mechanism using genetic algorithms (GAs) is proposed in this study to determine the reallocation of resources. The experimental results show that the proposed scheme achieves an effective configuration via reaching the agreement between the utilization of resources within physical machine monitored by physical machine monitor and Service Level Agreements (SLA) between virtual machines operator and cloud services provider. In addition, our proposed mechanism can fully utilize hardware resources and maintain desirable performance in the cloud environment.
S018	A Load-Balancing Based Charging Management Mechanism for Electric Vehicles *Chenn-Jung Huang, Hsiu-Hui Liao, Han Wen Tsai, Kai-Wen Hu, **Heng-Ming Chen**, and Jui-Jiun Jian* National Dong Hwa University **Abstract**—This work proposes an EV charging management mechanismand utilizes the scheduling systems for the charging stations to determine when to store electricity into batteries according to the real-time electricity price and charging requirement of EVs. A charging suggestion module is presented in this work to locate the most suitable charging station or battery exchange station for the EVs according to the available information in hand. When an EV cannot reach at any charging station due to the lack of electricity, a mobile charging vehicle management module is used to assisting the EV in finding a suitable mobile charging vehicle for recharging. The experimental results show that the proposed work can balance the loading of battery charging and exchange stations, and lower the load peak to make electricity cost down. Besides, the proposed charging suggestion module can decrease the driving distance of EVs for finding the charging stations and the waiting time wasted while charging. The mobile charging vehicle management module can effectively prevent EVs from halting on the road owing to running out of the electricity.
S2005	Fuzzy Controller Design Using FPGA for Sun and Maximum Power Point Tracking in Solar Array System *Basil Hamed and Mohammed El-Maghany* Islamic University of Gaza **Abstract**—In this paper, Two fuzzy logic controllers are fabricated on modern FPGA card (Spartan-3AN, Xilinx Company, 2009) to increase the energy generation efficiency of solar cells. These controllers are, sun tracking controller and maximum power point tracking controller. Sun tracking generating power system is designed and implemented in real time. A tracking mechanism composed of photovoltaic module, stepper motor, sensors, input/output interface and expert FLC controller implemented on FPGA, that to track the sun and keep the solar cells always face the sun in most of the day time. The proposed sun tracking controller, and maximum power point tracking controller are tested using Matlab/Simulink program, Maximum power point tracking system is designed and implemented in real time. The results show that both controllers have a response better than conventional controller applied on the same system.

S2007	Digital Currency for India
	Mahil Carr, Tripti Gupta, and Abhishek Pandey
	Institute for Development and Research in Banking Technology
	Abstract—This paper proposes a new Digital Currency System for India. The fundamental concepts of the system and the security properties required are specified using a formal specification language Z. An abstract specification is given here and it has to be further refined to a detailed concrete specification closer to implementation.
CQ1004	Application of a Coupled Simulation-Optimization System Called AnyPLOS in a Cold Foam Production Line
	Mohammad Amin Jahanpour, Kamran Farnian, and Kourosh Tahouri
	Central Branch of Islamic Azad University, Tehran, Iran
	Abstract—A prototype simulation-optimization system called AnyPLOS, which couples an Artificial Neural Network (ANN) based simulation model with a genetic algorithm optimization model, is presented. AnyPLOS is designed to discover value of effective input parameters of a production line so that all required quality control tests on the output product is satisfied. First an ANN was trained and tested to provide an acceptable level of accuracy in prediction of production line outputs, and then it was coupled with a GA optimization module to find desired solutions. A real world case study, in Erish Khodro manufacturing company, was set up and the foam production process input parameters were optimized so that the produced samples satisfied quality requirements. In order to verify the results, discovered solutions were used to produce real foam samples in the production line. After that, quality control tests were performed on samples. Quality test results were, as predicted by ANN, within the desired range. In order to estimate the performance of the trained ANN, experimental observations were compared to values which were predicted by ANN. A convincing correlation was found between ANN predictions and experimental values.
CQ1006	A New Priority-Sort Based Optimization Algorithm for Integrated Process Planning and Scheduling
	Ghiath Al Aqel, Muhammad F. Ausaf, Xinyu Li, and Liang Gao
	Huazhong University of Science and Technology
	Abstract—Modern manufacturing systems emphasize the need to improve the overall efficiency of the system and achieve global optimality rather than striving for excellence in isolated individual components. Integration of process planning and scheduling, which were previously treated as spate entities, has become an important area of research for accomplishing this goal. This paper presents a novel optimization algorithm for integrated process planning and scheduling (IPPS) problems. The algorithm is based on sorting the operations into different priorities. The experimental results show that the proposed algorithm can effectively solve IPPS problems.

Session 5- ICBCB 2013
Venue: Room 3, Level 3
17:00-18:30
Session chair:

ICBCB2013 10 papers 17:00-18:30	
B0003	Single Nucleotide Variant Calling Tools for RNA-Seq
	Yunqin Chen and Jia Wei
	AstraZeneca, R&D Information, Shanghai
	Abstract—Dissecting the transcriptome is essential for understanding the functional element of genome and molecular constituents of cells and tissues, and also important for revealing the cancer mechanism. High-throughput RNA sequencing (RNA-Seq) has enabled whole genome and transcriptome single nucleotide variant (SNV) discovery in cancer. In recent years, a number of SNV identification methods have been published from both public and commercial sources. Here we presented an overview and evaluation of these attempts on SNV calling. We defined a set of criteria and compared the performance of four tools (GATK, Samtools, VarScan and Array Studio) based on these criteria, and we further provided advices on lowering false positive mutation rate.
B0004	Missing Value Estimation In DNA Microarrays Using B-Splines
	Sujay Saha, Kashi Nath Dey, Riddhiman Dasgupta, Anirban Ghose and Koustav Mullick
	Heritage Institute of Technology, Kolkata
	Abstract—Gene expression profiles generated by the high-throughput microarray experiments are usually in the form of large matrices with high dimensionality. Unfortunately, microarray experiments can generate data sets with multiple missing values, which significantly affect the performance of subsequent statistical analysis and machine learning algorithms. Numerous imputation algorithms have been proposed to estimate the missing values. However, most of these algorithms fail

	to take into account the fact that gene expressions are continuous time series, and deal with gene expression profiles in terms of discrete data. In this paper, we present a new approach, FDVSplineImpute, for time series gene expression analysis that permits the estimation of missing observations using B-splines of similar genes from fuzzy difference vectors. We have used smoothing splines to relax the fit of the splines so that they are less prone to over fitting the data. Our algorithm shows significant improvement over the current state-of-the-art methods in use.
B0006	Robustness Analysis of the PI3K/AKT Cell Signaling Module *Tianhai Tian and Fuke Wu* Monash Univwersity *Abstract*—Cell responses are actuated by tightly controlled signal transduction pathways. Due to the complex nature of molecular processes inside the cell, mathematical models recently have been used as a powerful tool to analyze the dynamic properties of cell signaling pathways. Although the concept of an integrated signaling network replete with inter-pathway crosstalk and feedback regulation is broadly appreciated, kinetic data of the type needed to characterize such interactions in conjunction with mathematical models are lacking. In recent years a number of additional criteria such as robustness property have been proposed to validate the proposed mathematical models that should maintain certain important properties of biological systems. In this work we analyze the robustness property of the PI3K/Akt module using the method of perturbation to model rate constants. Simulation results suggested that the perturbation to the activation of Akt and PI3K kinases has more influence on the signal output of the module than other processes in the system.
B0013	Hemodynamic Changes in Coronary Artery after Stent Implantation Based on Patient-specific Model *Feng Gao, Gang Li and Hiroshi Okada* Tokyo University of Science *Abstract*— Intravascular stents are tubular structures placed into stenotic artery to expand the inside passage and improve blood flow. The mechanical factors affect the restenosis after stenting and image-based simulation has become a popular tool for acquiring information. The aim of this study was to demonstrate quantitatively and qualitatively the hemodynamic changes in coronary artery after stent implantation based on patient medical image data using computational fluid dynamics (CFD). One patient with coronary artery stenosis before and after stent implantation were included. Based on the CT data, three-dimensional model of pre- and post-stenting models were built. Commercial software Adina8.7 was used for CFD simulation. After stenting, the simulation shows a reduction of wall pressure and wall shear stress and a more equal flow through arteries after stenting. CFD is a noninvasive tool to demonstrate changes of flow rate and flow pattern caused by stent implantation. The effect and possible complications of a stent implantation can be visualized.
B1005	Sequence-based Prediction of Molecular Recognition Features in Disordered Proteins *Chun Fang and Hayato Yamana, Tamotsu Noguchi* Waseda Univwersity *Abstract*—Molecular recognition features (MoRFs) act as molecular switches in molecular-interaction network of the cell, and assumed to have relationship with the causes of many diseases. The importance of identifying MoRFs in disordered proteins is becoming increasingly apparent. So far, only a limited number of experimentally validated MoRFs is known, and there are few specialized tools for identifying MoRFs. Existing methods used many predicted results, such as predicted disorder probabilities, solvent accessibility and B-factors as features for prediction, or used MoRFs database directly for alignment to assist the prediction; however, their design are complex, and the performance is also affected largely by other predictors. In this study, we proposed a novel method, named as MFPSSMPred (Masked and Filtered PSSM based Prediction), which adopts a masking method to extract high local conservative features, and a filtering method to filter out low local conservative scores in position-specific scoring matrix (PSSMs) for prediction. All features are extracted from the sequences only. We compared our method with a traditional PSSM-based method and 9 other existed methods on a same test dataset. The experimental results showed that, our method achieved the best performance with AUC of 0.758. This study demonstrated that: 1) the flanking regions of MoRFs affected the plasticity of MoRFs; 2) MoRFs were flanked by less conserved residues; and 3) the revised PSSM was predictive features for identifying MoRFs.
B1006	NIM, A Novel Computational Method for Predicting Nuclear-encoded Chloroplast Proteins *Jun Ding, Haiyan Hu and Xiaoman L* University of Central Florida *Abstract*—The identification of nuclear-encoded chloroplast proteins is important for the understanding of their functions and their interaction in chloroplasts. Despite various endeavors in predicting these proteins, there is still room for developing novel computational methods for further improving the prediction accuracy. Here we developed a novel computational method called NIM based on interpolated Markov chains to predict nuclear-encoded chloroplast proteins. By testing the method on real data, we show NIM has an average sensitivity larger than 92% and an average specificity larger than 97%. Compared with the state-of-the-art methods, we demonstrate that NIM performs better or is at least comparable with them. Our study thus provides a novel and useful tool for the prediction of nuclear-encoded chloroplast proteins.
B1008	Relative Warp Analysis of Parasite–Induced Plasticity in the Shell Shape of the O. quadrasi *Edgar Gary Vasallo, Mark Anthony J. Torres and Cesar G. Demayo* MSU-Iligan Institute of Technology, Iligan City *Abstract*—The shell morphology of O. quadrasi is hypothesized to be driven through coevolution between S. japonicum infectivity capacities with O. quadrasi. This hypothesis predicts that measures of geometric-morphometric variations of snail populations parallel varied schistosome infections thus was evaluated in two provinces of Mindanao, Philippines where there were reported infections. Relative Warp Analysis was used in the investigation to determine shell shape divergence. For statistical analysis, Discriminant analysis and Kruskal-Wallis test were performed. The results showed that parasitism in O. quadrasi had significant effects on some morphometric dimensions of the snail- apertural and apical sculptures based on the shell shapes. These phenotypic variations accounted for more than 40% of the variance in shell morphology relative to mean shape. Even at low infection levels, 4.05% of the local populations being infected, the effects were even detectable.

	Analysis of geometric morphometrics of the two populations (cercariae-infected and uninfected shells) of O. quadrasi based on shell characters generally has demonstrated dimorphic features in shell shapes.
B1009	Analyzing Shape of Faces of Hypertensive and Non-Hypertensive Males Using Geometric Morphometric Methods *Christine Cherry E. Solon, Mark Anthony J. Torres, and **Cesar G. Demayo*** MSU-Iligan Institute of Technology, Iligan City Abstract—Geometric morphometric tools were used to analyze the shape of the faces of 84 hypertensive and non-hypertensive males. Image analysis was done on the forty one (41) landmarks of the face. Landmarking was done in three replicates making sure that one session is well spaced from another to minimize bias. The pooled data were fed into the SAGE program, which performed Principal Component Analysis, Analysis of Variance (ANOVA) and Procrustes Fit. Results revealed a higher fluctuating asymmetry in hypertensive male subjects compared to the non-hypertensives. This is further supported by the differences shown by scatterplot analysis.
B1013	Landmark-Based Geometric Morphometrics in Describing Facial Shape of the Sama-Banguingui Tribe from the Philippines *Olive S. Anies, Mark Anthony J. Torres, Muhmin Michael Manting, and **Cesar G. Demayo*** MSU-Iligan Institute of Technology, Iligan City Abstract—Studies of human forms using traditional methods only show minimal variations. However, advances in image analysis and statistics have resulted to highly quantitative descriptions of detailed variations. To be able to describe detailed variations and to understand the human face of tribes practicing consanguineous marriages like the Sama-Banguingui tribe, landmark-based geometric morphometrics was used. Selected purebreed individuals (25 males and 21 females) of the tribe participated in the study. Face images were landmarked using the 28 anatomical landmarks defined in this study. Relative warps scores generated were used for the analysis of shape variations. Visualization of variations was done using histograms and boxplots. Results showed minor differences in the shapes of the whole face in RW2 and RW3 but not in RW1, RW4, RW5 and RW6 where variations observed were not significantly different. The similarity in the facial characters within and between sexes observed in this study could be attributed to common ancestry and possibly due to consanguinity. This study have shown that the tools of geometric morphometrics can be used for detailed quantification of variations in shapes of morphological structures.
B1014	Prediction of the Binding Affinities of PSD95 PDZ Domain in Complex with the CRIPT Peptide *Junmei Wang* University of Texas Southwestern Medical Center Abstract—In this work, we have applied the state of art molecular dynamics simulations in combination with solvation free energy and conformational entropy calculations to predict the binding affinities of PSD95 PDZ domain in complex with the CRIPT peptide. Four diffident computational protocols were evaluated on reproducing the relative binding free energies of the wild type PDZ and its five mutants. The protocol of MM-GB/SA in combination with normal mode analysis (NMA), which has a correlation coefficient square of 0.84, apparently outperforms the others especially for the two MM-PB/SA-based protocols. Free energy decomposition was also performed in order to identify the hot spots that contribute significantly to the binding.

SESSION 6: ICDIP 2013
Venue: Venue: Room 5&6, Level 3
Time: 15:50-18:30
Session Chair:

	ICDIP 2013 15 papers Time: 15:30-18:30
I112	The Research of 3D Visualization Techniques for the Test of Laser Energy Distribution *Liu Lixin, Wang Bo* Changchun University of Science and Technology Abstract- In the process of laser transmission in the atmosphere, the complexity and instability of the atmospheric composition that seriously interfere with, even change, the performance of the laser beam. The image of laser energy distribution can be captured and analyzed through infrared CCD and digital image processing technology. The basic features of laser energy density distribution, such as the location and power of the peak point and other basic parameters could be acquired; laser energy density distribution can display in real time continuous multi-frame; the 3D visualization of pseudo-color for laser energy density distribution could be displayed, that reflect the relative size and position of the energy distribution in the different regions of the laser spot, using the VC++, windows APIs and OpenGL programming. The laser energy density distribution can be observed from all angles.
I124	Speed-Up Single Image Dehazing Using Double Dark Channels *Xuan Jin, Zhi-yong Xu*

Chinese Academy of Science

Abstract- Recent research has made significant progress in single image dehazing by using dark channel prior. We can directly estimate the thickness of the haze and recover a high quality haze-free image by using it. However, such method is inefficient when processing high resolution or high-bit-wide images because of its high computational complexity. Besides, the results are inaccurate when there are large white objects in the scene. A novel image prior is proposed in this paper to solve the above drawbacks. We develop a powerful and speed-up single image dehazing method by replacing the single dark channel with double dark channels with different scales to estimate the global atmospheric light and the transmission. Thus we can separate the method into two parts and ignore the soft matting that occupies 95% computation cost of the previous method. The experimental results show that our method is much faster than the original method and reduces the distortion caused by large white objects in the scene at the same time. Compared with previous method, our new single image dehazing method achieves the same, even better image quality with only around 1/23 computation time and saves lots of memory space.

I129	**Bispectrum for Welds Defects Detection from Radiographic Images** *Sara Saber and Gamal I. Selim* Arab Academy for Science and Technology, Egypt *Abstract-* This paper presents a proposed method for the detection of welds defects from radiographic images. Firstly, the radiographic images were enhanced using Adaptive Histogram Equalization and were filtered using Mean and Wiener filters. Secondly, the welding area was selected from the radiography image. Thirdly, the images were converted to signals then the features were extracted from the Bispectrum of these signals. Finally, neural networks were used for training and testing the proposed method. The proposed model was tested on 100 radiography images in the presence of noise and image blurring. Results show that the proposed model yields best results for the detection of weld defects in radiography images when using the Bispectrum method estimated by Autoregressive moving average (ARMA) method.
I135	**Human Action Recognition Using Integrated Model** *Yang Yi, Yikun Lin* Sun Yat-sen University, P.R.China *Abstract-* A novel action recognition framework based on integrated model is proposed in the paper. First, the covariance descriptor is utilized to extract features from video sequences, and then each class specific codebook is constructed and appended to the global codebook. A static model applying the template matching technique and a dynamic model employing the trigram model are learned to capture complementary information in an action. And lastly, an integrated model is used to estimate the confidence of the static and dynamic models and produces a reliable result. Comparative experiments show that our presented method achieves superior results over other state-of-the-art approaches.
I138	**An MPEG-21-driven multimedia adaptation decision-taking engine based on constraint satisfaction problems** *Xiao Feng, Rui-Chun Tang, Yi-Li Zhai and Bo-Hai Hong* Ocean University of China *Abstract-* Multimedia adaptation decision-taking techniques based on context are considered. Constraint satisfaction problem-Based Content Adaptation Algorithm (CBCAA) is proposed. First the algorithm obtains and classifies context information using MPEG-21; then it builds the constraint model according to different types of context information, constraint satisfaction method is used to acquire Media Description Decision Set (MDDS); finally a bit-stream adaptation engine performs the multimedia transcoding. Simulation results prove that the presented algorithm offers an efficient solution for personalized multimedia adaptation in heterogeneous environments.
I142	**FLPI representation of quantum images for log-polar coordinate** *Mo Wang* National University of Defense Technology *Abstract-* We propose aneffective method, flexible log-polar image (FLPI) to represent quantum images sampled in log-polar coordinate system.Each pixel is represented by three qubit sequences and the whole image is stored into a normalized quantum superposition state. If needed, a flexible qubit sequencecan be added to represent multiple images. Through elementary operations, both arbitrary rotation transformation and similarity evaluation can berealized. We also design an image registration algorithm to recognize the angular difference between two imagesif one is rotated from the other. It is proven that the proposed algorithm could get conspicuous improvement in performance.
I147	**An Image Retrieval System for Three–Dimensional Image** *Chu-Hui Lee, Jin-Shu Lin* Chaoyang University of Technology *Abstract-* With the progress of the age, the popularization of the computer and the internet, the text, images, photographs and varieties of multimedia will be uploaded to groups of the network space or cloud storage space by users. Thus, the multimedia data and technology have to renew and transfer by user constantly. How to search the images economically is a significant issue. This paper will focus on 3D images for in-depth investigate. It will propose an efficient 3D searching method. The analytical object is used by three-dimensional trademark gallery of the Intellectual Property Office of the Ministry of Economic Affairs, R.O.C.. One three-dimensional trademark image expresses by a set of 2D images. This paper uses Harris Corner detection and combines CPDH (contour points distribution histogram) method to extract the shape feature and uses color histogram to refine the color feature. And then, the two features help to retrieve the similar 3D images. Experiment verifies that the method we proposed is effective.
I149	**Multi-modal image registration based on diffeomorphic demons algorithm** *Chao Tang, Xiaohui Xie, Ruxu Du* Chinese Academy of Sciences, China

*Abstract-*Multi-modality image registration plays an important role in the domain of medical image processing. Diffeomorphic demons method has been proven to be a robust and efficient way for single mode image registration. However, it cannot deal with multi-modality image. In this paper we introduce mutual information into diffeomorphic demons method. On the basis of original force for driving image deformation, the proposed method adds mutual information gradient on the current transformation and adds mutual information into the energy function. We compare the performance of image registration results among our proposed method, diffeomorphic demons method and B-spline based free form deformation method in combination with mutual information. Experiment shows that our proposed method gives the better results like the smallest registration errors in case of local distortions. In conclusion, our proposed method has good performance in dealing with local deformation multi-model image registration.

I152	Anomaly Detection in Crowds Using a Space MRF with Incremental Updates
	Nannan. Li, Dan. Xu, Xinyu. Wu, Guoyuan.Liang
	Chinese Academy of Sciences

Abstract-In this paper, we propose a space Markov Random Field (MRF) model to detect abnormal activities in crowded scenes. The nodes of MRF graph consist of monitors evenly spread on the image, and neighboring nodes in space are associated with links. The normal patterns of activity at each node are learnt by constructing a Gaussian Mixture Model (GMM) upon optical flow locally, while correlation between adjacent nodes is represented by building a single Gaussian model upon inner product of histogram vectors of optical flow observed from a region centered at each node respectively. For any optical flow patterns detected in test video clips, we use the learnt model and MRF graph to calculate an energy value for each local node, and determine whether the behavior pattern of the node is normal or abnormal by comparing the value with a threshold. Further, we apply a method similar to updating of GMM for background subtraction to incrementally update the current model to adapt for visual context changes over a long period of time. Experiments on the published UCSD anomaly datasets Ped1 and Ped2 show the effectiveness of our method.

I158	Convergent Point Positioning Methods for Dual-view Stereo Camera
	Xiaowei Song, Lei Yang, Yuanzhao Wu
	Zhongyuan University of Technology

Abstract-The spatial position of convergent point of dual-view stereo camera is a key parameter. To solve the problem that lack of simple and effective convergent point positioning method at present, we present two methods of convergent point positioning. The first method for convergent point positioning is by observing the difference between the corresponding points of principal points in left and right images. The second method is by computing the relative extrinsic parameters between right and left cameras. The experimental results show that the first method is convenient for the stereo camera which consists of adjustable left and right cameras; the second method is convenient for the stereo camera which consists of stable left and right cameras. Both of the methods are available for convergent point positioning.

I159	Development of an image processing system in splendid squid quality classification
	Niyada Masunee, Supapan Chaiprapat, and Kriangkrai Waiyagan
	Prince of Songkla University, Songkhla, Thailand

Abstract-Agricultural products typically exhibit high variance in quality characteristics. To assure customer satisfaction and control manufacturing productivity, quality classification is necessary to screen off defective items and to grade the products. This article presents an application of image processing techniques on squid grading and defect discrimination. A preliminary study indicated that surface color was an efficient determinant to justify quality of splendid squids. In this study, a computer vision system (CVS) was developed to examine the characteristics of splendid squids. Using image processing techniques, squids could be classified into three different quality grades as in accordance with an industry standard. The developed system first sifted through squid images to reject ones with black marks. Qualified squids were graded on a proportion of white, pink, and red regions appearing on their bodies by using fuzzy logic. The system was evaluated on 100 images of squids at different quality levels. It was found that accuracy obtained by the proposed technique was 95% compared with sensory evaluation of an expert.

I162	Multiresolutional Graph Cuts for Brain Extraction from MR Images
	Yong-Sheng Chen, Li-Fen Chen, and Yi-Ting Wang
	National Chiao Tung University

Abstract-This paper presents a multiresolutional brain extraction framework which utilizes graph cuts technique to classify head magnetic resonance (MR) images into brain and non-brain regions. Starting with an over-extracted brain region, we refine the segmentation result by trimming non-brain regions in a coarse-to-fine manner. The extracted brain at the coarser level will be propagated to the finer level to estimate foreground/background seeds as constraints. The short-cut problem of graph cuts is reduced by the proposed pre-determined foreground from the coarser level. In order to consider the impact of the intensity inhomogeneities, we estimate the intensity distribution locally by partitioning volume images of each resolution into different numbers of smaller cubes. The graph cuts method is individually applied for each cube. Compared with four existing methods, the proposed method performs well in terms of sensitivity and specificity in our experiments for performance evaluation.

I3008	Research on remote sensing image pixel attribute data acquisition method in AutoCAD
	Liu Xiaoyang, Sun Guangtong, Liu Jun, Liu Hui
	Institute of Disaster Prevention

Abstract-The remote sensing image has been widely used in AutoCAD, but AutoCAD lack of the function of remote sensing image processing. In the paper, ObjectARX was used for the secondary development tool, combined with the Image Engine SDK to realize remote sensing image pixel attribute data acquisition in AutoCAD, which provides critical technical support for AutoCAD environment remote sensing image processing algorithms.

I3009	The experiments and analysis of several selective video encryption methods
	Yue Zhang, Cheng Yang, Lei Wang

|	Communication University of China **Abstract-**This paper presents four methods for selective video encryption based on the MPEG-2 video compression,including the slices, the I-frames, the motion vectors, and the DCT coefficients. We use the AES encryption method for simulation experiment for the four methods on VS2010 Platform, and compare the video effects and the processing speed of each frame after the video encrypted. The encryption depth can be arbitrarily selected, and design the encryption depth by using the double limit counting method, so the accuracy can be increased.
I3015	A Fast Point Spread Function for Particle in Fluorescent Image with GPU Acceleration *Yong Cheng, **Hai Wang**, Heng Zhang* Beijing University of Chemical Technology **Abstract-**While the rapid development in optical and storage technique enable us to easily acquire large amount of microscopy images, it is still a great challenge for biological researchers to analyze these huge data and draw meaningful and statistically sound conclusions. In this paper, we take single particle point spread function _tting problem into consideration and implement fast algorithm on the CPU + GPU heterogeneous architecture. Our approach is tested on real-world dataset and achieve about 23 _ 40x faster than the traditional _tting algorithm.

Dinner banquet
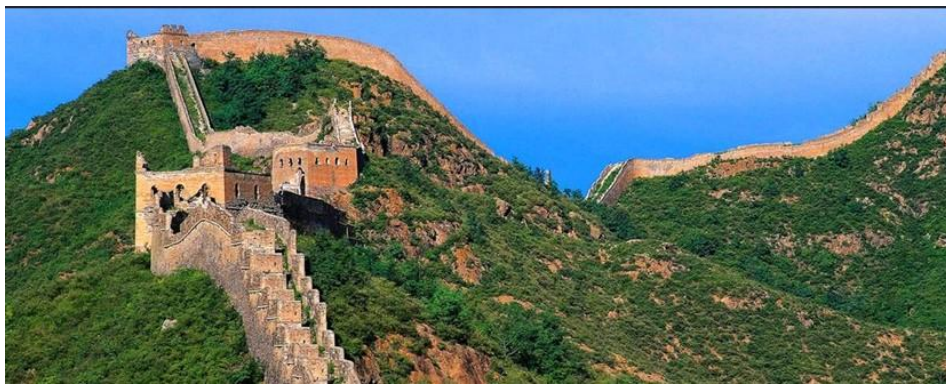**Venue:** Restaurant, Level 23
19:00-20:00

One-day tour
One-day Tour on April 23, 2013(Tuesday)

08:00-18:00 One-day Tour in Beijing (Free of Charge)

The sight spot will be selected from The Forbidden City, The Great Wall, Summer Palace and etc.
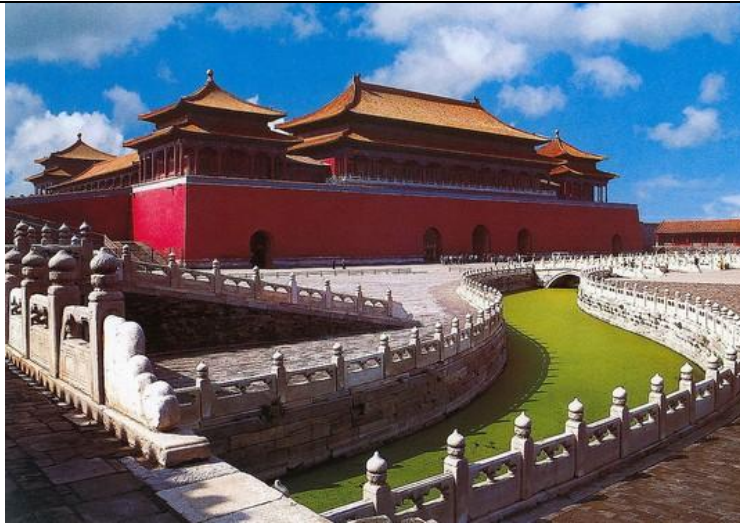
The Forbidden City

The Great Wall

Summer Palace

Please register at the registration counter, and the One Day Tour Coupon will be given.

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Regular Oral Session: 8-12 Minutes of Presentation

Keynote Speech: 40 Minutes of Presentation 5 Minutes of Q&A

Conference Venue

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