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CONFERENCE ABSTRACTS

**2019 2nd International Conference on Control and Computer
Vision (ICCCV 2019)**

**2019 2nd International Conference on Data Storage and Data
Engineering (DSDE 2019)**

June 15-18, 2019

Jeju Island, South Korea



Hotel RegentMarine The Blue

Add: 20, Seobudu 2-gil Jeju-si, Jeju-do, Korea

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WELCOME

Dear professors and distinguished delegates,

Welcome to 2019 2nd International Conference on Control and Computer Vision and 2019 2nd International Conference on Data Storage and Data Engineering in Jeju Island!

We wish to express our sincere appreciation to all the Conference Chairs, Technical Program Chairs, and Technical Program Committee. Their high competence and professional advice enable us to prepare the high-quality program. Special thanks to the keynote speakers as well as all the authors for contributing their latest research to the conference. We hope all of you have a wonderful time at the conference and also in Jeju Island.

The conference is featured with keynote speeches and parallel sessions. One best presentation will be selected from each parallel session, evaluated from: Originality, Applicability, Technical Merit, Visual Aids, and English Delivery. Wishing you all the very best of luck with your presentations!

We believe that by this excellent conference, you can get more opportunity for further communication with researchers and practitioners with the common interest in Control and Computer Vision, Data Storage and Data Engineering.

In order to hold more professional and significant international conferences, your suggestions are warmly welcomed. We look forward to meeting you again next time.

Yours sincerely,

Conference Organizing Committee
Jeju Island, South Korea

COMMITTEE

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Franklin Bien, Ulsan National Institute of Science and Technology, Korea

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Mohammed Abdallah Bakr Mahmoud, Beijing Institute of Technology, China

NOTES & TIPS

Notes:

- ✧ You are welcome to register at any working time during the conference.
- ✧ Please kindly keep your Paper ID in mind so that the staff can quickly locate your registration information onsite.
- ✧ Certificate of Listener can be collected in front of the registration counter. Certificate of Presentation will be awarded after your presentation by the session chair.
- ✧ One *Best Presentation* will be selected from each parallel session and the author of best presentation will be announced and awarded when the session is over.
- ✧ Your punctual arrival and active involvement in each session will be highly appreciated.
- ✧ Please kindly make your own arrangements for accommodations.
- ✧ Please keep all your belongings (laptop and camera etc.) with you in the public places, buses, metro.

Warm Tips for Oral Presentation:

- ✧ Get your presentation PPT or PDF files prepared.
- ✧ Regular oral presentation: 15 minutes (including Q&A).
- ✧ Laptop (with MS-Office & Adobe Reader), projector & screen, laser sticks will be provided by the conference organizer.

VENUE

Hotel RegentMarine The Blue

Add: 20, Seobudu 2-gil Jeju-si, Jeju-do, Korea

www.hotelrmbblue.com

Location:

In front of Tap-dong Square in Jeju where the beautiful sea and sky spread out, Hotel RegentMarine The Blue welcomes you. Hotel RegentMarine The Blue is located in front of Jeju Tap-dong Square, a major cultural center in Jeju. Go straight via Yongmun-ro from Jeju International Airport intersection Turn right toward Jejumokkwana at Yongmun rotary Pass through Jejumokkwana, turn left toward Tap-dong and go straight 500m (0.3mile) Turn right toward Seobudu and go straight 160m (0.1mile) Arrive at Hotel RegentMarine The Blue (4.7km/2.9mile, 15 minutes).



KEYNOTE



Prof. Reinhard Klette

Auckland University of Technology, New Zealand

Prof. Reinhard Klette (Auckland University of Technology, Fellow of the Royal Society of New Zealand, Quancheng Friendship Award, Helmholtz Fellow) made significant contributions to two major areas, digital geometry and computer vision. He is the director of the Centre for Robotics & Vision (CeRV).

Professor Klette has been working in the area of computer vision for more than 30 years. In 2003 he published with the late Professor Aziel Rosenfeld of University of Maryland, USA, the first comprehensive monography on digital geometry (published by Morgan Kaufmann, San Francisco). He has become internationally renowned for his work in vision-based driver assistance since 2006, with important contributions on performance evaluation and improvements of correspondence algorithms (for stereo matching and optical flow) on realworld video data, supporting, for example, 3D scene reconstruction from a mobile platform.

In 2008 he co-authored (with two of his former PhD students) a research monograph on panoramic vision (with Wiley, UK), in 2011 a research monograph (also co-authored with a former PhD student) on shortest paths in Euclidean spaces (with Springer, UK), and in 2017 a research monograph (also co-authored with a former PhD student) on vision-based driver assistance (with Springer, The Netherlands). His book entitled “Concise Computer Vision” has been published by Springer, London (UK), on 5 January 2014. In August 2018, the number of downloads of e-copies of this book, or parts of it, from Springer’s website surpassed the 61,000 mark. This is an exceptional high number for any computer science textbook published by Springer.

Since 1995, Professor Klette has been invited as a keynote or plenary speaker to international conferences worldwide. Between April 2011 and October 2013 he has been the founding Editor-in-Chief of the Journal of Control Engineering and Technology (JCET). He was an Associate Editor of IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI) between 2001 and 2008, which is a top-ranked journal in all engineering and computer science disciplines. He is a life-time honorary steering committee member of the biennial conferences on Computer Analysis of Images and Patterns, taking place in Europe, and a steering committee member of the Pacific- Rim Symposium on Image and Video Technology.

Professor Klette supervised already 30 PhD students to the successful completion of their PhD program.

KEYNOTE



Prof. Yulin Wang
Wuhan University, China

Prof. Yulin Wang is a full professor and PhD supervisor in International School of Software, Wuhan University, China. He got PhD degree in 2005 in Queen Mary, University of London, UK. Before that, he has worked in high-tech industry for more than ten years. He has involved many key projects, and hold 8 patents. He got his master and bachelor degree in 1990 and 1987 respectively from Xi-Dian University, and Huazhong University of Science and Technology (HUST), both in China. His research interests include digital rights management, digital watermarking, multimedia and network security, and signal processing. In recently 10 years, Prof. Wang has published as first author 3 books, 40 conference papers and 45 journal papers, including in IEEE Transactions and IEE proceedings and Elsevier Journals. Prof. Wang served as editor-in-chief for International Journal of Advances in Multimedia in 2010. He served as reviewer for many journals, including IEEE Transactions on Image Processing, IEEE Signal Processing Letters, Elsevier Journal of Information Sciences. He served as reviewer for many research funds, including National High Technology Research and Development Program of China ('863' project). Prof. Wang was the external PhD adviser of Dublin City University, Ireland during 2008-2010. He was the keynote speakers in many international conferences. He has been listed in Marcus 'who's who in the world' since 2008.

KEYNOTE



Prof. Franklin Bien

Ulsan National Institute of Science and Technology, Korea

Professor Franklin Bien received the B.S. degree from Yonsei University in 1997. He received his M.S. and Ph.D. degrees from the Georgia Institute of Technology at Atlanta, GA in 2000 and 2006 respectively. Dr. Bien's heritage roots from Dr. Joy Laskar. This also means Dr. Bien's heritage roots from a Nobel laureate and the father of 'transistor', Dr. John Bardeen as you can see from the 'People' tab.


Prior to joining UNIST in 2009, Dr. Franklin Bien was with Staccato Communications, San Diego, CA as a Senior IC Design Engineer working on analog/mixed-signal IC and RF front-end blocks for Ultra-Wideband (UWB) products such as Wireless-USB.

Before working at Staccato, Dr. Bien was with Agilent Technologies and Quellan Inc., developing transceiver ICs for enterprise segments that improve the speed and reach of communication channels in consumer, broadcast, enterprise and computing markets.



In the early stage of his career including the Ph.D. work, Dr. Bien's research interests included signal integrity improvement with alternate modulation schemes, cross-talk noise cancellation, and equalization techniques for 10+Gb/sec broadband communication applications. Dr. Bien's research and design experiences includes CMOS RF front-end circuits for UWB wireless communications, adaptive circuits for wireless power transfer (WPT) applications, and electronics design for future automobiles and electric vehicles. For more, please visit http://bicdl.unist.ac.kr/UNIST_ECE_Franklin_Bien/Home.html.

ABSTRACT


<June 15, 2019, Saturday>

 The Lobby	
10:00-17:00	Onsite Registration & Conference Materials Collection

<June 16, 2019, Sunday> Morning


 Regent Room		
09:00-09:10	Opening Remark	Prof. Yulin Wang Wuhan University, China
09:10-09:50	Keynote Speech I	Prof. Franklin Bien Ulsan National Institute of Science and Technology, Korea
		<i>Speech Title: Control Loop enabled Full RF Glucose Sensing Technology</i>
09:50-10:20	Coffee Break & Group Photo	
10:20-11:00	Keynote Speech II	Prof. Yulin Wang Wuhan University, China
		<i>Speech Title: Image Authentication and Tamper Localization</i>
11:00-11:40	Keynote Speech III	Prof. Reinhard Klette Auckland University of Technology, New Zealand
		<i>Speech Title: Large-scale 3D Roadside Modelling with Road Geometry Analysis: Digital Roads New Zealand</i>
 Lunch Time <12:00-13:30> Location: Restaurant Latif		

<June 16, 2019, Sunday> Afternoon

14:00-15:45	Session I-Artificial Intelligence and Applications 7 presentations	 Regent Room
	VE1001, VE1016, VE1017, VE1031, VE3003, VE1010, VE1035	

 **Coffee Break <15:45---16:00>**

ABSTRACT



16:00-18:00	Session II-Computer Vision 8 presentations	 Regent Room
	VE1011, VE1022, VE1024, VE1034, VE1036, VE2002, VE1033, VE1027	



Dinner <18:00-20:00> Location: Restaurant Latif

ABSTRACT

June 16, 2019

Opening & Speeches Time: 09:00-11:40  Regent Room	
09:00-09:10	Opening Remark Prof. Yulin Wang Wuhan University, China
09:10-09:50	<p style="text-align: center;"><i>Control Loop enabled Full RF Glucose Sensing Technology</i> Prof. Franklin Bien Ulsan National Institute of Science and Technology, Korea</p> <p>Abstract-Diabetes affect more than 425 Million patients worldwide responsible for over 5 Million annual death. Diabetes patients must monitor their glucose levels in order to have proper medical treatment including insulin injection and others. Unlike the commonly known Type 2 diabetes, there is a Type 1 diabetes whose pancreas doesn't function properly. This affects more than 50 Million patients world wide, and they must monitor their glucose levels more often, at least every hour. As a result, conventional pricking method to monitor the glucose levels can be cumbersome and painful for the Type 1 diabetic patients. In order to enhance the quality of life for Type 1 diabetic patients, an alternative way to the pricking method has emerged: the Continuous Glucose Monitoring (CGM) systems. The CGM in the market today uses an enzyme based sensors that need to be replace every week resulting in very high cost for the patients while causing skin rash problems. In this talk, we present a Control loop enabled fully electromagnetically sensing CGM technology that excludes any enzyme based electro-chemical based sensors.</p>
 Coffee Break & Group Photo 09:50---10:20	
10:20-11:00	<p style="text-align: center;"><i>Image Authentication and Tamper Localization</i> Prof. Yulin Wang Wuhan University, China</p> <p>Abstract-Image authentication can be used in many fields, including e-government, e-commerce, national security, news pictures, court evidence, medical image, engineering design, and so on. Since some content-preserving manipulations, such as JPEG compression, contrast enhancement, and brightness adjustment, are often acceptable—or even desired—in practical application, an authentication method needs to be able to distinguish them from malicious tampering, such as removal, addition,</p>

ABSTRACT


	<p>and modification of objects. Therefore, the traditional hash-based authentication is not suitable for the application. As for the semi-fragile watermarking technique, it meets the requirements of the above application at the expense of severely damaging image fidelity. In this talk, we propose a hybrid authentication technique based on what we call fragile hash value. The technique can blindly detect and localize malicious tampering, while maintaining reasonable tolerance to conventional content-preserving manipulations. The hash value is derived from the relative difference between each pair of the selected DCT coefficient in a central block and its counterpart which is estimated by the DC values of the center block and its adjacent blocks. In order to maintain the relative difference relationship when the image undergoes legitimate processing, we make a pre-compensation for the coefficients. Finally, we point out the direction using deep leaning technique for image authentication.</p>
11:00-11:40	<p><i>Large-scale 3D Roadside Modelling with Road Geometry Analysis: Digital Roads New Zealand</i></p> <p>Prof. Reinhard Klette Auckland University of Technology, New Zealand</p> <p>Abstract-Latest developments in camera technology and computer vision, as well as in computer and communication technologies, contribute to improving safety on roads by the development of new key technologies, such as autonomous driving or driver-assistance systems.</p> <p>These new technologies need to be tested extensively and purposefully, and supported by environment or infrastructure models or integrated sensors. The paper reports about a project ``Digital Roads New Zealand'', undertaken by DLR Berlin (an institute of the German Aerospace Centre), AUT (Auckland University of Technology, New Zealand), and N3T, a company at Whangarei, New Zealand. Novel sensor technologies, including stereo vision and odometry, have been used for recording, modelling and analysing a very large test site.</p> <p>It is demonstrated how those data can be used for detecting changes in road geometry, such as various forms of road surface distress. An important novelty of the shown solution is the scale of the project (i.e. size of the digitised area using car-mounted sensors) together with the achieved very high accuracy in road-geometry analysis. - This talk is joint work with DLR Berlin, N3T Whangarei, and Amita Dhiman and Hsiang-Jen Chien at AUT.</p>



Lunch Time <12:00-13:30> Location: Restaurant Latif

Note: lunch coupon is needed for entering the restaurant.

ABSTRACT

Session I: Artificial Intelligence and Applications Time: 14:00-15:45  Regent Room Chair: Assoc. Prof. Jungsun Kim, University of Nevada Las Vegas, USA	
VE1001 14:00-14:15	<p style="text-align: center;">Railway Signal Interlocking Logic Simulation System Lidong Zhang Shandong Jiaotong University, China</p> <p>Abstract—Railway interlocking systems are apparatuses that prevent conflicting movements of trains through an arrangement of tracks. In this paper, we formulated the main way to design a railway signal interlocking simulation system. To simulate the interlocking logic of railway signal, we first analyzed such devices as signals, track circuit, switches and train routes. Then we designed such classes as signal class, track circuit class, switch class and route class based on object-oriented programming language. By defining the attributes of every class and taking full consideration of the signal relays' types and amounts, we developed the interlocking logic simulation system with C# language. The simulation system is applied on the actual station chart of downward throat and proves it's applicable. The system realized interlocking logic implementation and signal opening functions. Being put into practice, it proves to be worthy of promotion and widely used.</p>
VE1016 14:15-14:30	<p style="text-align: center;">Optimizing Data Augmentation for Semantic Segmentation on Small-Scale Dataset RuiMa, PinTao and HuiYunTang Tsinghua University, China</p> <p>Abstract—Augment the training data has a significant effect for deep learning on small-scale dataset. For practical semantic segmentation applications, it is a hard work to collect and annotate enough training data for training the deep neural network. In this paper, we focus on which data augmentation (DA) method is better, and what combination of different DA methods can improve the network performance more. Our target application is highland AI-Ranch which is hard to collect many training data. We firstly collect and produce a small-scale open source of sheep segmentation dataset including hundreds images, referred to as SSG dataset. Seven frequently used data augmentation methods are evaluated, including global augmentation (augment for the whole image) such as flipping, and local augmentation (augment only for the region of interest) such as cropping, etc. Especially, a novel image compression global DA method is proposed which can achieve the best augmentation performance in global methods. Furthermore, we explore the performance of the cross-combination data augmentation technique when applying to a small-scale semantic segmentation dataset. As different DA method will cover the different sample distribution, more augmentation fed more good training data and meanwhile more bad training data to the network. Therefore, too much augmentation may pull down the performance sometimes. Experiment</p>

ABSTRACT

	<p>results show that the combination of compression, cropping and local shift can achieve the best augmentation performance for our AI-Ranch application, the average coverage mean-IoU improve from 73.3% to 91.3%, even better than the combination of whole augmentation methods.</p>
<p>VE1017 14:30-14:45</p>	<p style="text-align: center;">An Interactive Multiplayer Mobile Application Using Feature Detection and Matching for Tourism Promotion Waraporn Viyanon Srinakharinwirot University, Thailand</p> <p>Abstract—The idea of developing an interactive multi-player mobile application for tourism promotion using image matching on the Android platform was initiated from the Thai government’s policy promoting tourism in order to have a significant impact on the revenues of Thai tourism industry. This application requires a user to be in a real place to complete missions that he or she has selected. The application navigates the user to the selected place. While playing, the user must do missions by taking photos of an object specified in the gallery database in a period of time. The taken photo will be compared with images in the gallery using Oriented FAST and Rotated BRIEF (ORB), the feature detection and matching. Each set of images tested with SSD, SAD, and NCC algorithms with different thresholds in order to find a suitable value that gives good results. In order to make the application more engaging, the application was designed to use/play with multiple users. The experimental results show that the application can detect user ’ s position and lead the user to the target place correctly using GPS technology and can compare images accurately in case of the taken image and the images in the gallery have the same angle or small angle (less than 30 degree) and have little difference in light intensity. The evaluation of overall user satisfaction from thirty testers is at a good level.</p>
<p>VE1031 14:45-15:00</p>	<p style="text-align: center;">Controlling Software Evolution Process Using Code Smell Visualization Nabilah and Wikan Danar Institut Teknologi Bandung, Indonesia</p> <p>Abstract—Software change is inevitable, evolution becomes a part of software lifetime, and software release becomes more frequent. Hence there is a need for the project manager to inspect and control the process during software development and evolution. In the evolutionary stage, developers will face problems related to program code, one of that is identification of code smells. This problem could negatively affect maintainability in evolution, a developer needs more time and money. Visualization techniques turn data into a visual form so that it can provide information that is easier to understand. In software evolution, visualization mostly is used to view structure code. Previous research on evolution visualization limited to visualize the addition of code, the last update, release history, and information of developer that made the last change in program. However, this visualization is not enough to support understanding for the developers. We propose a visualization method for identifying code smell of the</p>

ABSTRACT


	<p>evolution software on java programming, so the developers can more easily understand the code that will be evolved. By knowing where the smell of code in the program, programmers can immediately do refactoring, the time and costs needed will also be low. Visualization of code smell is something new in the domain of software evolution. Finally, this design created to build tools in detecting code smells for software evolution process control.</p>
VE3003 15:00-15:15	<p style="text-align: center;">Compaction and Compression Techniques for File Systems Based on Persistent Memories</p> <p style="text-align: center;">Yi-Han Lien, Yi-Hua Chen and Po-Chun Huang National Taipei University of Technology, Taiwan</p> <p>Abstract—File systems are the most popular means of data storage in many computing environments. The appropriate designs of file systems therefore become key research highlights to enhance the data access performance and storage space utilization. As diversified persistent memories (PMs) are considered powerful competitors of mechanical hard disks due to their ideal access performance and energy efficiency, file system designers need to adopt various compression or compaction techniques to reduce the space wastes, because the storage density of PMs are still considerably lower than that of hard disks. However, there are still missing pieces in the puzzle which overviews the potential approaches that enhance the storage space utilization from various perspectives of a file system. In this work, we shall take a revisit to the promising techniques that help enhance the storage space utilization of file systems based on PMs. It is observed that an effective compression or compaction technique not only benefits the storage space utilization, but also ameliorates the access performance of the file system.</p>
VE1010 15:15-15:30	<p style="text-align: center;">Combination of Local Binary Pattern, Gabor Filter and Neural Networks for Facial Expression Recognition</p> <p style="text-align: center;">Le Minh Dong, Nunthong Pance, Kittipan Roongprasert, Anata Sak and Lee Gueesang Korea Advanced Institute of Science and Technology, South Korea</p> <p>Abstract—Recent years has shown dramatic progress in facial expression recognition, especially on such applications as human-computer interaction (HCI), biometric analysis, content-based coding of images and video, and surveillance. However the problem of confounding factors from the input images, with an emphasis on image illumination variations as well as a lot of minor feature in faces make the accuracy of almost previous approaches are limited. In this study we propose a new method for facial expression recognition. Our solution bases on combination of local binary patterns, Gabor filter and artificial neural networks. This method is not only effective in learning the feature of emotion from the eyes, nose and mouth but also is sanguine when solving the problem of illumination variations. We carry out our approach in public material from Japanese Female Facial Expression (JFFE) database and the performance is over 97 percent of accuracy.</p>

ABSTRACT

VE1035 15:30-15:45	<p style="text-align: center;">Recognizing Faces in Shades of Gray Alaa E. Abdel-Hakim, Moumen El-Melegy and Shreen Refaay Assiut University, Egypt</p> <p>Abstract—Face recognition depends on relatively few distinguishing features, when compared with common facial features. This gives color information greater value to recognition and identification processes. However, dealing with grayscale facial images is a must in some cases, e.g. legacy images. In this paper, we investigate the effect of losing color information on face recognition. We propose a novel framework, which utilizes CNN-based colorization before a CNN classifier. The proposed framework is tested on LFW benchmark dataset. The evaluation results prove the success of the proposed framework in reducing the negative effect of dropping the color information on face recognition performance.</p>
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Coffee Break <15:45---16:00>

Session II: Computer Vision Time: 16:00-18:00  Regent Room Chair: Prof. Reinhard Klette, Auckland University of Technology, New Zealand	
VE1011 16:00-16:15	<p style="text-align: center;">Using Machine Vision to Command a 6-axis Robot Arm to Act on A Randomly Placed Zinc Die Cast Product Luke Butters, Zezhong Xu and Reinhard Klette Auckland University of Technology, New Zealand</p> <p>Abstract—The paper presents a method, documenting the machine vision techniques required, to automate a manual process at a local New Zealand manufacturing company. The system was required to monitor a conveyor belt for zinc die cast outputs. A robot arm was informed how to pick up the object. Die cast outputs appear face up or down and can be rotated 360°. Four experiments were conducted to determine how accurately the proposed system could detect if the cast was lying face up or down, determine the robot picking location, and determine the angle of direction while performing an error checking function. Circle Hough transform and principal component analysis, along with other object analysis techniques, were used on 2D datasets. Point cloud data was analysed to determine if the cast was face up or down when taken from a time-of-flight camera.</p>
VE1022 16:15-16:30	<p style="text-align: center;">A Robust and Effective Tracking Method in Remote Sensing Video Sequences Bi Fukun, Lei Mingyang and Sun Jiayi North China University of Technology, China</p>

ABSTRACT

	<p>Abstract—With the popularization of high resolution imaging technology and the progress of artificial intelligence, remote sensing target tracking in the aerial video plays a very important role in public security, such as antiterrorism efforts and military reconnaissance. As aerial video has rapid changes in orientations, low resolution, and multiple similar disruptors, and the main tracking methods generally have relatively low tracking performance in this research field, we develop a robust tracking method for remote sensing videos based on a saliency enhanced multi-domain convolutional neural network (SEMD). The process can be divided into two main stages: (1) in the offline pretraining stage, we combine the Least Squares Generative Adversarial Networks (LSGANs) with a rotation strategy to augment typical easily confused negative samples, which can improve the capacity to distinguish between target and the background. (2) in the online tracking process, a saliency module is embedded between convolutional layers and we optimize the arrangement of its functional sub-modules to boost the saliency of the feature map, which improve the network representation power for rapid dynamic changes in the target. Comprehensive evaluations of homemade datasets demonstrate that the proposed method can achieve high efficiency and accuracy results compared to state-of-the-art methods.</p>
<p>VE1024 16:30-16:45</p>	<p style="text-align: center;">Chinese Rubbing Image Binarization Based on Deep Learning for Image Denoising Zhi-Kai Huang, Zhen-NingWang, Jun-Mei Xi and Ling-Ying Hou Nanchang Institute of Technology, China</p> <p>Abstract—Aiming at the problem of the Chinese rubbing image segmentation under a denoising algorithm based on deep convolutional neural network is proposed. Document enhancement and binarization is the main pre-processing step in document analysis process. At first, a feed-forward denoising convolutional neural networks as a pre-processing methods for document image has been used for denoise images of additive white Gaussian noise(AWGN). The residual learning mechanism is used to learn the mapping from the noisy image to the residual image between the noisy image and the clean image in the neural network training process. A median filtering has been employed for denoising`salt and pepper' noise. Given the learned denoising and enhanced image, we compute the adaptive threshold image using local adaptive threshold algorithm and then applies it to produce a binary output image. Experimental results show that combined those algorithms is robust in dealing with non-uniform illuminated, low contrast historic document images in terms of both accuracy and efficiency.</p>
<p>VE1034 16:45-17:00</p>	<p style="text-align: center;">Modified Watershed Transform for Automated Brain Segmentation from Magnetic Resonance Images Siamak Roshanzadeh and Masoud Afrakhteh Chosun University, South Korea</p> <p>Abstract—The segmentation of human brain from Magnetic Resonance Image (MRI) is one of the most important parts of clinical diagnostic. Brains' anatomical structures</p>

ABSTRACT

	<p>can be visualized and measured through image segmentation. Especially, while clinical analysis of magnetic resonance images, accurate segmentation is a crucial task for precise subsequent analysis. Watershed transform is a widely used segmentation method in medical image analysis field. Regarding MRI images, they always contain noise caused by different operating equipment and environmental situation. However, the performance of the watershed transform depends on converges of numerous local minima on the image. Wrong regional minima on the image cause a high rate of over-segmentation of the watershed transform method. To address this problem, in this paper we propose a modified watershed transform method to prevent over-segmentation using k-means clustering method. Our modified watershed transform utilizes the k-means clustering method for region classification to remove wrong regional minima on image and provides a guideline for watershed transform to prevent the over-segmentation problem. Experimental results on brain MRI images evaluations (Dice coefficient: 95.32%) demonstrate that the proposed method can substantially prevent the over-segmentation problem of conventional watershed transform method.</p>
VE1036 17:00-17:15	<p style="text-align: center;">Deep Residual Network for Single Image Super-Resolution Haimin Wang, Kai Liao, Bin Yan an Run Ye University of Electronic Science and Technology of China, China</p> <p>Abstract—This paper proposes a Deep Residual Network for Single Image Super-Resolution (DRSR). We build a deep model using residual units that remove unnecessary modules. We can build deeper network at the same computing resources with the modified residual units. Experiments shows that deepening the network structure can fully utilize the image contextual information to improve the image reconstruction quality. The network learns both global residuals and local residuals, making the network easier to train. Our network directly extracts features from Low-Resolution (LR) images to reconstruct High-Resolution (HR) images. Computational complexity of the network is dramatically reduced in this way. Experiments shows that our network not only performs well in subjective visual effect but also achieves a high level in objective evaluation index.</p>
VE2002 17:15-17:30	<p style="text-align: center;">Video Object Segmentation with 3D Convolution Network Huiyun Tang, Pin Tao, Rui Ma and Yuanchun Shi Tsinghua University, China</p> <p>Abstract—We explore a novel method to realize semi-supervised video object segmentation with special spatiotemporal feature ex-tracting structure. Considering 3-dimension convolution net-work can convolute a volume of image sequence, it is a distinct way to get both spatial and temporal information. Our net-work is composed of three parts, the visual module, the motion module and the decoder module. The visual mod-ule learns object appearance feature from object in the first frame for network to detect specific object in following image sequences. The motion module aims to get</p>

ABSTRACT

	<p>spatiotemporal information of image sequences with 3-dimension convolution network, which learns diversities of object temporal appearance and location. The purpose of decoder module is to get foreground object mask from output of visual module and motion module with concatenation and upsampling structure. We evaluate our model on DAVIS segmentation dataset[15]. Our model doesn't need online training compared with most detection-based methods because of visual module. As a result, it takes 0.14 second per frame to get mask which is 71 times faster than the state-of-art method-OSVOS[2]. Our model also shows better performance than most methods proposed in recent years and its meanIOU accuracy is comparable with state-of-art methods.</p>
<p>VE1033 17:30-17:45</p>	<p style="text-align: center;">Design Therapy for Post-Stroke Patients with Robotics Tools and Principles of Mirror Neurons Using qEEG Parameter Analysis Rudi Setiawan, Hasballah Zakaria and Odilia Valentine Bandung Institute of Technology (ITB), Indonesia</p> <p>Abstract—Stroke causes neurological disorders such as reduced muscle motor skills, as well as cognitive, visual, and coordination functions, significantly. The reduced level of independence and mobility of a person can affect their quality of life. So, with rehabilitation program, it is expected that motor skills and cognitive function of stroke patients can be restored. This study focused on designing an integrated therapeutic device by using stationary cycles with the principle of mirror neurons and equipped with qEEG signal analysis for parameters comparison before and after therapy. Channels EEG used are F3, F4, C3, Cz, C4, P3, Pz, and P4 according to the rules of localization 10-20 Ref. The device also designed as a robotic system controlled by the movement intentions detected from EEG signals before the actual movement occurs. The Event-Related Potential (ERP) phenomenon mu waves were used to recognize the movement intentions. The device has been tested on normal subjects. To train the movement intention algorithm, the subject were asked to cycle and stop at prescribed time by audio command. qEEG parameters were displayed through a monitor for realtime observation by physical therapist. This research is part of the design process of the stroke therapy system which will then be tested in several stroke patients. Therapy programs for post-stroke patients using this device are expected to increase mobility of the affected limb by stroke.</p>
<p>VE1027 17:45-18:00</p>	<p style="text-align: center;">Early Diagnosis of Alzheimer's Disease Using Deep Learning Huanhuan Ji and Weiqi Yan Presenter: Reinhard Klette Auckland University of Technology, New Zealand</p> <p>Abstract—Alzheimer's disease (AD) leads to memory losing and impairment as well as other symptoms, thus affects ordinary lives of patients. It is not curable, but earlier confirmation of AD may be helpful for proper early treatment so as to avoid brain further damaging. Over the past decades, machine learning methods have been</p>

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ap-plied to the classification of AD with results based on manually prepared features and a classifier having multiple steps architecture. Recently, with the development of deep learning, the end-to-end process of neural networks has been employed for pattern classification. In this paper, we devote to early diagnosis of Alzheimer's disease based on convolution neural networks (ConvNets) by using the magnetic resonance imaging (MRI). The slices of Gray Matter (GM) and White Matter (WM) images from MRI have been used as the inputs for the classification. The ensemble learning method is employed after this convolutional process so as to improve the classification by combining the outputs of the deep learning classifiers. Three ConvNets and two machine learning methods were designed, implemented and compared in this paper. Our method was evaluated based on the dataset from the Alzheimer's disease Neuroimaging Initiative (ADNI) for the early diagnosis of this illness. In particular, the accuracy of classifications have reached up to 98.59% for AD/NC, 97.65% for AD/MCI, and 88.37% for MCI/NC.



Dinner <18:00-20:00> Location: Restaurant Latif

Note: Dinner coupon is needed for entering the restaurant.

