

Conference Abstract

2018 2nd International Conference on Digital Signal
Processing

(ICDSP 2018)

2018 International Conference on Computer Graphics
and Virtuality

(ICCGV 2018)

February 25-27, 2018

Tokyo · Japan

Supported by:



Published by:



Welcome Letter

Dear Participants,

It is our great pleasure to invite you to join our 2018 2nd International Conference on Digital Signal Processing (ICDSP 2018) & 2018 International Conference on Computer Graphics and Virtuality (ICCGV 2018). This event will provide a unique opportunity for editors and authors to get together and share their latest research findings and results. We are looking forward to your attendance in Tokyo, Japan.

After several rounds review procedure, the program committee accepted those papers to be published in conference proceedings. We wish to express our sincere appreciation to all the individuals who have contributed to ICDSP 2018 & ICCGV 2018. Special thanks are extended to our colleagues in program committee for their thorough review of all the submissions, which is vital to the success of the conference, and also to the members in the organizing committee and the volunteers who had dedicated their time and efforts in planning, promoting, organizing and helping the conference. Last but not least, our special thanks go to our Speakers as well as the authors for contributing their latest research to the conference.

We truly hope you'll enjoy the conference and get what you expect from the conference.

Conference Organizing Committee

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Conference Location and Directions

Tokyo Bay Ariake Washington Hotel

<http://tokyobay.washington-hotels.jp/>
Address: 3-7-11, Ariake, Koto-ku, Tokyo 135-0063
Person in Charge: Sadako Mine
E-mail: enkai@ariake-wh.com
Phone: +81 3 5564-01



Transportation Tips:

The hotel is located just in front of Kokusai-tenjijo Station on the Rinkai Line and conveniently close to the Odaiba area. It also offers free shuttle bus service to Tokyo Disney Resort every day (reservation required). Gundam Front Tokyo and Diver City Tokyo Plaza are 10 minutes away by train plus walking distance.

From Narita International Airport

About 70 minutes by Airport Limousine Bus bound for Odaiba and Ariake areas

One-way fare: 2,700 yen for adults (1,350 yen for children)

*Seat reservation is required for buses departing the hotel.

From Haneda Airport

About 40 minutes by Airport Limousine Bus bound for Takeshiba / Odaiba and Ariake areas

One-way fare: 600 yen for adults (300 yen for children)

*Seat reservation is required for buses departing the hotel.

From Haneda Airport Terminal 1 Station via Tokyo Monorail

Take the Tokyo Monorail from Haneda Airport Terminal 1 Station. Change at Tennozu Isle Station to the Rinkai Line, and take that to Kokusai-tenjijo-seimon Station. Approx. 33 minutes. One-way adult fare: 660 yen.

From Haneda Airport Terminal 2 Station via Tokyo Monorail

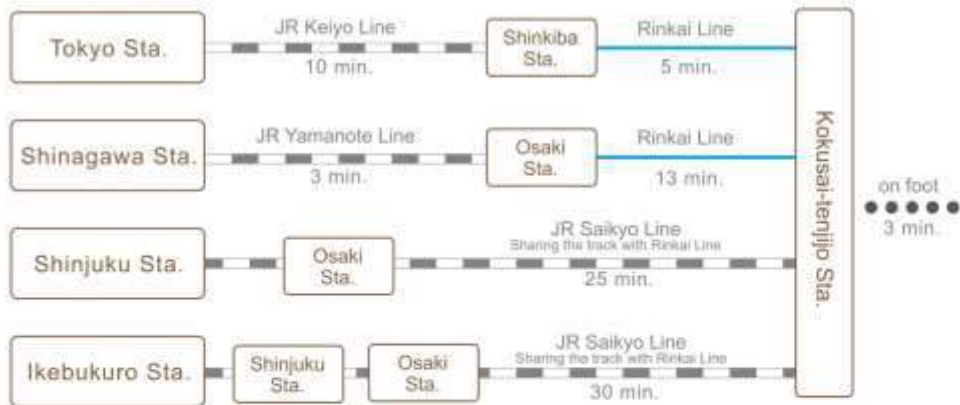
Take the Tokyo Monorail from From Haneda Airport Terminal 2 Station to Tennozu Isle Station. Change at Tennozu Isle Station to the Rinkai Line, and take that to Kokusai-tenjijo-seimon Station. Approx. 35 minutes. One-way adult fare: 730 yen.

From JR Tokyo Station

Take the JR Keiyo Line to Shinkiba Station. Change there to the Rinkai Line. About 20 minutes.



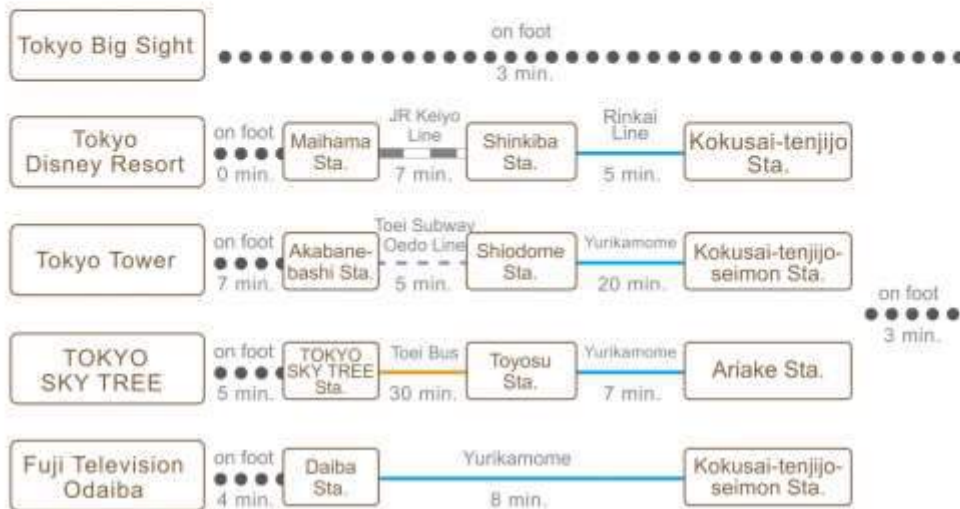
By train



By car



Route guidance from neighboring tourist spots



TOKYO BAY ARIAKE WASHINGTON HOTEL

Instructions for Presentation

Oral Presentations

- Time: a maximum of 15 minutes in total, including speaking time and discussion. Please make sure your presentation is well timed. Please keep in mind that the program is full and that the speaker after you would like their allocated time available to them.
- You can use CD or USB flash drive (memory stick), make sure you scanned viruses in your own computer. Each speaker is required to meet her / his session chair in the corresponding session rooms 10 minutes before the session starts and copy the slide file (PPT or PDF) to the computer.
- It is suggested that you email a copy of your presentation to your personal in box as a backup. If for some reason the files can't be accessed from your flash drive, you will be able to download them to the computer from your email.
- Please note that each session room will be equipped with a LCD projector, screen, point device, microphone, and a laptop with general presentation software such as Microsoft Power Point and Adobe Reader. Please make sure that your files are compatible and readable with our operation system by using commonly used fronts and symbols. If you plan to use your own computer, please try the connection and make sure it works before your presentation.
- Movies: If your Power Point files contain movies please make sure that they are well formatted and connected to the main files.

Poster Presentations

- Maximum poster size is 36 inches wide by 48 inches high (3ft.x4ft.)
- Posters are required to be condensed and attractive. The characters should be large enough so that they are visible from 1 meter apart.
- Please note that during your poster session, the author should stay by your poster paper to explain and discuss your paper with visiting delegates.

Dress code

- Please wear formal clothes or national characteristics of clothing

Program at a Glance

Sunday, February 25, 2018 (10:00-17:00)		
10:00-17:00	Arrival and Registration	Lobby
Monday, February 26, 2018(8:45-13:30)		
8:45	Registration	Lobby
9:00	Opening Session	
9:05-9:50	Keynote Speech I Prof. Yasuhiro Matsuda, Kanagawa Institute of Technology, Japan	Rindo/Gentian
9:50-10:35	Keynote Speech II Prof. Beomjin Kim, Indiana University-Purdue University Fort Wayne, USA	
10:35-11:05	Group Photo & Coffee Break	
11:05-11:50	Keynote Speech III Prof. Tae-Seong Kim, Kyung Hee University, South Korea	Rindo/Gentian
11:50-13:30	Lunch	Dining Room
Monday, February 26, 2018(13:30-18:00)		
13:30-15:30	Session 1 Target detection and recognition	Rindo/Gentian
13:30-15:30	Session 2 Image Processing Technology and Methods	Cattleya
15:30-16:00	Coffee Break	
16:00-18:00	Session 3 Signal and Data Analysis	Rindo/Gentian
16:00-18:00	Session 4 Computer Science and Aided Design	Cattleya
Monday, February 26, 2018(18:30-20:00)		
18:30-20:00	Dinner Banquet	Dining Room
Tuesday, February 27, 2018(8:00-24:00)		
8:00-24:00	City Tour	

Note: Please arrive at the conference room 10 minutes ahead to prepare your presentation materials.

Keynote Speech



Prof. Yasuhiro Matsuda, Kanagawa Institute of Technology, Japan

Biography:

Prof. Yasuhiro Matsuda obtained his Ph.D. degree from the University of Tokyo in 2007. He joined the Department of Welfare Systems Engineering at Kanagawa Institute of Technology in 2000, and later joined the Department of Robotics and Mechatronics. Now, he is a professor and department chair of the Department of Clinical Engineering. Prof. Matsuda's expertise is in the field of assistive technology for deaf and/or blind persons and measurement engineering. Currently, his main research interest is in the development of the communication support system using Finger Braille for deafblind person and tactual communication tool for elderly person.

Speech Title: Finger Braille Recognition System

Abstract:

Finger Braille is one of the communication media of deafblind people. In one-handed Finger Braille, a sender dots the left part of the Braille code on the distal interphalangeal (DIP) joints of the index, middle and ring fingers of a receiver, and subsequently dots the right part of the Braille code on the proximal interphalangeal (PIP) joints of the same fingers. To assist communication between deafblind individuals and non-disabled people, we have been developing a Finger Braille recognition system using small piezoelectric accelerometers worn by the receiver. The recognition system recognizes the dotting of Finger Braille by the deafblind person and synthesizes this tactile communication into speech for the non-disabled person. The accelerometers were mounted on the top of finger rings. The results of the evaluation experiment showed that the recognition system could recognize the dotted fingers and positions accurately when the interpreter dotted clearly.

Keynote Speech



Prof. Beomjin Kim, Indiana University-Purdue University Fort Wayne, USA

Biography:

Beomjin Kim is a professor and the chair of the Computer Science Department at Indiana University-Purdue University Fort Wayne, Indiana, USA. He is the director of the Information Analytics and Visualization Center: a Center of Excellence at IPFW that was established in 2011 with a \$500,000 grant awarded from Lilly Endowment Inc. Dr. Kim obtained his Ph.D. in Computer Science from the Illinois Institute of Technology in 1998. He has received several research awards, including the Distinguished Research Award from Allied Academies and the Researcher of the Year Award from the IPFW Sigma Xi Chapter. He has conducted projects funded by the National Science Foundation, State of Indiana, Purdue Research Foundation, Parkview Health System, and regional businesses. He serves as a member of editorial boards on journals and the program committee of conferences. His research interests include data analytics and visualization, virtual reality, medical imaging, and computer science education.

Speech Title: The Effect of Computer Graphics Techniques on Perceiving Depth in Virtual Environments

Abstract:

3D stereoscopic devices have been utilized in a variety of areas such as entertainment, simulation, training, education, and medicine. It provides depth perception advantages, but there are known limitations that prevent users from accurately perceiving depth. The lack of natural depth cues and differences between the user's actual convergence in reality and the viewer's convergence on the screen can make depth perception difficult. Researchers have studied techniques to improve the perception of users in examining stereoscopic images and reduce visual fatigue when they use 3D vision technology. Previous studies have produced mixed results, showing a general trend of underestimation in depth perception in 3D environments. This study examines the influence of graphics techniques selectively applied to 3D images for reducing measurement errors. The experimental results presented outcomes in perceiving depth that changed depending on the use of techniques and image types. The study reemphasizes the significance of utilizing depth cues and also suggests future research directions for investigating impacts of depth cues.

Keynote Speech



Prof. Tae-Seong Kim, Kyung Hee University, South Korea

Biography:

Prof. Tae-Seong Kim, Ph.D. Professor, Dept. of Biomedical Engineering, Kyung Hee University, Republic of Korea. Director, Bioimaging and Brain Engineering Laboratory, Kyung Hee University, Republic of Korea

Tae-Seong Kim received the B.S. degree in Biomedical Engineering from the University of Southern California (USC) in 1991, M.S. degrees in Biomedical and Electrical Engineering from USC in 1993 and 1998 respectively, and Ph.D. in Biomedical Engineering from USC in 1999. After his postdoctoral work in Cognitive Sciences at the University of California at Irvine in 2000, he joined the Alfred E. Mann Institute for Biomedical Engineering and Dept. of Biomedical Engineering at USC as Research Scientist and Research Assistant Professor. In 2004, he moved to Kyung Hee University in Korea where he is currently Professor in the Department of Biomedical Engineering. His research interests have spanned various areas of biomedical imaging, bioelectromagnetism, neural engineering, and assistive biomedical lifecare technologies. Dr. Kim has been developing advanced signal and image processing methods, pattern classification, machine learning methods, novel medical imaging modalities, and rehabilitation technologies. Dr. Kim has published more than 300 papers and seven international book chapters. He holds ten international and domestic patents and has received nine best paper awards.

Speech Title: Deep Learning Methodologies in Smart Assistive Lifecare Technologies

Abstract:

Due to the rapid increase in the elderly population, the field of assistive lifecare technologies is also advancing rapidly. The goal of assistive lifecare technology is to increase the quality of life and to promote the health of residents proactively, especially for the elderly, for ambient assisted living. In general, smart sensors and devices in smart environments are active components of ambient assisted living technologies. Also they provide alternative means of e-healthcare over caregivers or institutional care. In this presentation, how deep learning methodologies can be applied to these smart multi-modal sensors and devices for assistive lifecare technologies. Various topics including human activity recognition, human motion recognition, life event detection, lifelogging, etc. will be covered.

Detailed Schedule

Arrival & Registration

Time: Sunday, February, 25, 2018 (10:00-17:00)

Location: Hotel Lobby

Opening Session

Time: Monday, February, 26, 2018 (8:45-13:30)

Location: Rindo /Gentian

Time: 9:00-9:05

Opening Remarks

Time: 9:05-9:50

Keynote Speech I

Prof. Yasuhiro Matsuda,
Kanagawa Institute of Technology, Japan



Time: 9:50-10:35

Keynote Speech II

Prof. Beomjin Kim,
Indiana University-Purdue University Fort Wayne, USA



Coffee Break & Group Photo

Time: 10:35-11:05



Time: 11:05-11:50

Keynote Speech III
Prof. Tae-Seong Kim,
Kyung Hee University, South Korea

Lunch Break

Time: 11:50-13:30

Location: Dining Room (Note: Lunch coupon is required for the meal)

Parallel Sessions

Time: Monday, February, 26, 2018 (13:30-18:15)

Location: Rindo /Gentian & Cattleya

Session1 <Target detection and recognition>

Venue: Rindo/Gentian

Session Chair: Prof. Yasuhiro Matsuda

Time: 13:30-15:30

Note:

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GV017

Time: 13:30-13:45

Performance Improvement of Image Enhancement Methods Using Statistical Moving Average Histogram Modification Filter

Bhupendra Gupta, Mayank Tiwari and Subir Singh Lamba

PDPM Indian Institute of Information Technology, Design & Manufacturing Jabalpur, India



ABSTRACT:

Most of the histogram equalization (HE) based image contrast enhancement methods are having a common problem that they over enhanced the highly frequent grey levels whereas less frequent grey levels are comparatively less enhanced. The reason behind this is that in most of the contrast enhancement methods (based on HE) the histogram transformation function is directly proportional to the frequency of occurrence of grey level in the image. This motivates us to design a tool to solve this problem. We propose a histogram modification filter based on moving average to deal with the above-mentioned problem. This filter works as a pre-processing step for most of the conventional HE based methods. Experimental results show that the proposed filter is able to enhance the performance of most of the conventional HE based methods. We have also designed a tool the implements all these methods, this tool is tested for real time video's frame enhancement.

SP003

Time: 13:45-14:00

Abnormal Trajectory Detection for Security Infrastructure

Van-Khoa LE, Pierre BEAUSEROY and Edith GRALL-MAES

University of Technology of Troyes (UTT)



Abstract:

In this work, an approach for the automatic analysis of people trajectories is presented, using a multi-camera and card reader system. Data is first extracted from surveillance cameras and card readers to create trajectories which are sequences of paths and activities. A distance model is proposed to compare sequences and calculate similarities. The popular unsupervised model One-Class Support Vector Machine (One-Class SVM) is used to train a detector. The proposed method classifies trajectories as normal or abnormal and can be used in two modes: off-line and real-time. Experiments are based on data simulation corresponding to an attack scenario proposed by a security expert. Results show that the proposed method successfully detects the abnormal sequences in the scenario with very low false alarm rate.

SP004

Time: 14:00-14:15

An Edge-preserving Completion Method for Airborne Equipment Monitoring Data

Yanhong Lu, Meng Zhang, Hui Shi and Xiaohong Qin

Northwestern Polytechnical University, China



Abstract:

In the airborne equipment monitoring data processing, the problems of low sampling rate and data loss in the transmission process are solved by data completion method. In this paper, we propose a data completion method based on edge-preserving. In the edge-preserving data completion method, for a pending signal, many signal segments are extracted by a processing window sliding along the signal sequence. For one missing data sample, there are multiple signal segments, containing it or adjacent to it, can be used for restoring it. We use polynomials to fit these signal segments and estimate the missing data sample by the one signal segments with the minimum fitting error to achieve the purpose of edge-preserving. Theoretical model and actual data processing results show that this method is edge-preserving and can be used for restoring irregular data. It can reconstruct irregular flight parameters effectively as well as maintain the original edge features of airborne equipment monitoring data in every mission phases.

SP025

Time: 14:15-14:30

Detection and Tracking of Faces in 3D using a Stereo Camera Arrangements

Faleh AlQahtani, Jasmine Banks, Vinod Chandran and Jinglan Zhang

Queensland University of Technology



Abstract:

3D facial tracking has become vital to the continued integration of computers, technology, and human society. In recent decades, the integration of technology has increased, and the use of surveillance, conference calls, gaming components, and other similar applications has spurred demand for the ability to recognize the distinctive features of humans. However, in order for these new technologies to function effectively and reach their fullest potential, a great deal of work is still needed. The field of facial mapping and tracking is still in its early developmental stages, necessitating additional research into the best methods of tracking and monitoring specific human faces. To this end, an algorithm has been created that would allow for improvements in this area; however, a video was first required that could be used effectively for the algorithm. Two web cameras running on Raspberry Pi were used to gather the footage necessary for detecting and tracking specific facial features. While certain limitations were identified throughout the process, the algorithm still achieved significant successful tracking results. In spite of this success, further efforts are still needed to effectively explore the proposed algorithm and improve upon these initial results.

SP006

Time: 14:30-14:45

Detecting an Alteration in Biometric Fingerprint Databases

Yahaya Isah Shehu, Anne James and Vasile Palade

Coventry University, United Kingdom

Abstract:

Assuring the integrity of biometric fingerprint templates in fingerprint databases is of paramount importance. Fingerprint templates contain a set of fingerprint minutiae which are various points of interest in a fingerprint. Most times, it is assumed that the stored biometric fingerprint templates are well protected and, as such, researchers are more concerned with improving/developing biometric systems that will not suffer from an unacceptable rate of false alarms and/or missed detections. The introduction of forensic techniques into biometrics for biometric template manipulation detection is of great importance and little research has been carried in this area. This paper investigates possible forensic techniques that could be used for stored biometric fingerprint templates tampering detection. A Support Vector Machine (SVM) classification approach is used for this task. The original and tampered templates are used to train the SVM classifier. The fingerprint datasets from the Biometrics Ideal Test (BIT) [13] are used for training and testing the classifier. Our proposed approach detects alterations with an accuracy of 90.5%.

SP020-A

Time: 14:45-15:00

Detecting Latent Quantization Schemes Using a Convolution Neural Network

Michael Sealander

Abstract:

Discretizing a signal into a number of quantization levels is involved to some degree in nearly all digital signal processing, with many different uniform and non-uniform quantization schemes existing for different purposes. Indeed, signal transmission through digital communication systems may involve transcoding between multiple different quantization schemes. It is of interest here to detect the presence of latent quantization schemes different from the final, observed signal quantization. Specifically, this work seeks to discriminate between signals originating from two arbitrary classes of quantization schemes, following both an intermediate obfuscatory processing step and a final quantization into only one of the two original quantization schemes. A generative model for this process is developed to generate synthetic random samples where each sample per class has a corresponding sample in the other class differing only in the originating quantization scheme. A 1-D convolutional neural network (CNN) comprised of three layers is deployed in TensorFlow and trained to classify samples as belonging to one of the two originating quantization schemes. Performance is compared to several other classification algorithms using manually engineered features. Additionally, the paired nature of the dataset is exploited to 'direct' stochastic gradient descent



(SGD) during optimization by concurrently feeding rival samples. This ‘directed’ SGD results in significantly faster convergence times. Both the application of CNNs for this task and the use of paired, rivaling samples for a ‘directed’ SGD are believed to be novel.

GV004

Time: 15:00-15:15

Adaptive Segmentation Method for Evaluating of Choroidal Thickness on Optical Coherence Tomography

Yu-Len Huang ,Chia-Jen Chang and Jhao-Yu Huang

Department of Computer Science, Tunghai University,Taiwan

ABSTRACT:

Optical coherence tomography (OCT) is a medical imaging technique that has been used for many years, and it can capture the three-dimensional image from retina in a stable, quick and noninvasive way. In many clinical diagnoses from OCT imaging, researches show that certain diseases are related to the thickness of choroid. This study proposes an efficient method to detect the boundaries of choroid and estimate the choroidal thickness automatically. The proposed method provides a faster and much accurate measurement, improve the effective of the manual delineation and avoid the human error. Firstly, the proposed method utilizes image smoothing operators with regional characteristic as preprocessing procedure to reduce noise in the OCT images. Then the similarity of the gray-level is performed to divide the retina region. The boundary of choroid is obtained by measuring the gradient of pixel with morphological operators in the OCT imaging. The results from computer simulation reveal that the proposed method always identified choroidal boundary accurately. Such a method provides robust and fast automatic sketching for evaluating the value of choroidal thickness on OCT imaging.

GV006

Time: 15:15-15:30

Proposal for a Method of Extracting Road Layers from Remote Sensing Images Using Conditional GANs

Seongyong Kim, Seula Park and Kiyun Yu

Seoul National University, Republic of Korea



ABSTRACT:

With the recent advances in unmanned aerial vehicle (UAV) technology, remote sensing images have become relatively easy to obtain and their accuracy has increased enough to be able to handle land information. Therefore, there is a growing demand to utilize remote sensing images for extracting semantic objects. Conventional methods are mainly focused on pixel-based classification and recently people commonly use convolutional neural networks, which post processing is required to linearize roads that are cut off and accurately shape the contours of buildings. We propose the use of a generative model to carry out this post

	processing in the networks. Using conditional Generative Adversarial Network (GANs), we translate remote sensing images into map-based images from which roads are easily extracted, while retaining the underlying structure. Next, we extract road layers from the generated images. Through this approach, it is possible to achieve the same effect as if complicating post processing were done in the networks during the object extraction process.
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Session2<Image Processing Technology and Methods>


Venue: Cattleya

Session Chair:

Time: 13:30-15:30

Note:

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	<p>GV015</p> <p style="text-align: right;">Time: 13:30-13:45</p> <p>Human Motion Generative Model using Variational Autoencoder Makoto Murakami, Yuichiro Motegi and Yuma Hijioka,</p> <p>Toyo University, Japan</p> <p>ABSTRACT: We present a technique to learn large human motion data captured with optical motion capture system, represent it in a low dimensional latent space, so as to generate natural and various human motions from it. To extract human motion features we use a convolutional autoencoder, and to represent the extracted features as a probability density function in a latent space we use a variational autoencoder. Motion generator is modeled as a map from a latent variable sampled in the latent space to a motion capture data. We stack the convolutional decoder on top of the variational decoder, which can sample a latent variable and produce a motion. As a result, our system can generate natural and various human motions from a 32-dimensional latent space.</p>
	<p>SP015</p> <p style="text-align: right;">Time: 13:45-14:00</p> <p>An Image Annotation Rectifying Method Based on Deep Features Mansour Jamzad , Artin Ghostan Khatchatoorian</p> <p>Sharif University of Technology</p> <p>Abstract:</p>

Automatic image annotation methods generate a list of tags for each test image and present it in a matrix structure. To achieve a more accurate annotation, we propose a method with the aim of correcting the tag list. In our method, we detect an indicator for each group of tags and use it to rectify the annotation results. To find a correct indicator, we apply a deep feature vector generated by the “AlexNet” model. Using this indicator, we determine the suitable tags for an image. The proposed method is independent of feature vector, dataset, and annotation method. It can be applied to the currently available annotation methods. Our experiments showed improvement in all annotation methods tested.


SP032

Time: 14:00-14:15

Compressive Sensing Image Reconstruction Using Super-resolution Convolutional Neural Network

Lilian HUANG , **Zhonghang ZHU**

Harbin Engineering University, Harbin Engineering University , China



Abstract:
Compressed sensing (CS) can recover a signal that is sparse in certain representation and sample at the rate far below the Nyquist rate. But limited to the accuracy of atomic matching of traditional reconstruction algorithm, CS is difficult to reconstruct the initial signal with high resolution. Meanwhile, scholar found that trained neural network have a strong ability in settling such inverse problems. Thus, we propose a Super-Resolution Convolutional Neural Network (SRCNN) that consists of three convolutional layers. Every layer has a fixed number of kernels and has their own specific function. The process is implemented using classical compressed sensing algorithm to process the input image, afterwards, the output images are coded via SRCNN. We achieve higher resolution image by using the SRCNN algorithm proposed. The simulation results show that the proposed method helps improve PSNR value and promote visual effect.


GV007

Time: 14:15-14:30

Performance Improvement of Image Enhancement Methods Using Statistical Moving Average Histogram Modification Filter


Bhupendra Gupta ,Mayank Tiwari and Subir Singh Lamba


PDPM Indian Institute of Information Technology, Design & Manufacturing Jabalpur, India



ABSTRACT:
Most of the histogram equalization (HE) based image contrast enhancement methods are having a common problem that they over enhanced the highly frequent grey levels whereas less frequent grey levels are comparatively less enhanced. The reason behind this is that in most of the contrast enhancement methods (based on HE) the histogram transformation function is directly proportional to the frequency of occurrence of grey level in the image. This

motivates us to design a tool to solve this problem. We propose a histogram modification filter based on moving average to deal with the above-mentioned problem. This filter works as a pre-processing step for most of the conventional HE based methods. Experimental results show that the proposed filter is able to enhance the performance of most of the conventional HE based methods. We have also designed a tool the implements all these methods, this tool is tested for real time video's frame enhancement.

	<p>GV021</p> <p style="text-align: right;">Time: 14:30-14:45</p> <p>Lighting and Shadow Techniques for Realistic 3D Synthetic Object Compositing in Images Ana Mihut, Richard Davison, Gary Ushaw, Graham Morgan</p> <p>Newcastle University, United Kingdom</p> <p>ABSTRACT: Artificial 3D object compositing has recently gained interest in the context of emerging augmented and virtual reality technology. The problem takes as input the initial scene and places a 3D object anywhere within it, rendering a realistic output. This approach is challenging in the absence of prior knowledge of scene geometry, or user annotation to approximate it. Single images of a scene may not reveal all the present illumination conditions, nor reliable depth information. The state-of-the-art methods do not account for compositing 3D objects in between existing scene topology, nor cater for the inclusion of objects behind transparent areas within the original scene. We contribute a framework capable of realistic 3D object compositing with physically accurate soft shadows into a 2D scene derived from a stereo image pair which does not rely on the user's scene annotations for recreating a realistic result or on the availability of RGB-D capable hardware. The benefit of this approach is that hardware information and user knowledge are not required factors in either the 3D reconstruction stage, nor the compositing stage of the framework. We conclude with a step-by-step analysis across all of the stages of the pipeline.</p>
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	<p>SP012</p> <p style="text-align: right;">Time: 14:45-15:00</p> <p>Backtracking Adaptive Matching Pursuit Reconstruction Algorithm Based on Improved Matching Criterion Xiangjun Yin, Linyu Wang, Huihui Yue and Ming Li</p> <p>Harbin Engineering University, China</p> <p>Abstract: Accurate matching the best atom is the key factor for compressed sensing reconstruction process to precisely recovery of the goal signal. The inner product matching criterion applied by Backtracking adaptive matching pursuit algorithm (BAOMP) is the lack of consideration of information, leading to the imprecise matching of the best atoms. The matching criterion of Dice coefficient considered the signal reduces the reconstruction error. So this paper proposed</p>
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a new algorithm named Dice-BAOMP, which get the better performance. Simulation results verified the performance of proposed algorithms that success rates of reconstruction are 8%-10% higher than original algorithm.



SP013

Time: 15:00-15:15

Orthogonal Matching Pursuit Algorithm Via Improved Matching Criterion

Huihui Yue, Jianhong Xiang, Xiangjun Yin, Ming Li

Harbin Engineering University, China

Abstract:

Better support set Selected is the key step in Compressed Sensing to improve the reconstruction effect. The inner product matching criterion adopted in orthogonal matching pursuit algorithm fails to fully consider the correlation between the residuals and the atoms, which leads to greater error in the reconstruction process. As for this, an improved criterion is proposed and applied to the reconstruction algorithm to optimize the support set and improve the reconstruction performance. Through experimental simulation, the performance of algorithm proposed is verified to be an overall improvement in the reconstruction success rate and error under the same conditions compared to the orthogonal matching pursuit algorithm.



SP045

Time: 15:15-15:30

A Bezier Curve Cohort Selection Strategy for Face Pair Matching

Goutam Sanyal ,Jogendra Garain, Ravi Kant Kumar, Dakshina Ranjan Kisku

National Institute of Technology, Durgapur, INDIA

Abstract:

The matching of two face images without any prior information is very much challenging task unlike a verification or identification system where already some knowledge about the images of each subjects are stored in the system's database. This paper proposes a methodology to enrich the performance of a face pair matching system by utilizing the complementary information collected from a set of cohort face images with the help of Bezier Curve cohort selection algorithm. A pair of face images is given as input to the system. Each image is compared with a predefined cohort pool to form two separate set of cohort scores. Further these set of cohort scores are passed through Bezier curve cohort selection method which provide two suitable cohort subsets. Afterwards a cross normalization is accomplished in conjunction with T-norm score normalization method then the absolute normalized difference between the paired face images is determined. On the basis of this normalized difference, it is finally decided whether the input face pair is from same person or not. The system is investigated with FEI face database and the results are quite impressive.

Coffee Break

Time: 15:30-16:00

Session3<Signal and Data Analysis>

Venue: Rindo/Gentian

Session Chair: Prof. Beomjin Kim

Time: 16:00-18:00

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SP022

Time: 16:00-16:15

Classification of User Movement Data

Kaushik Roy , Pablo Arias, Christopher Kelley, Janelle Mason, Kelvin Bryant

North Carolina A&T State University

Abstract:

In this paper, a comprehensive analysis of various classification techniques is used on user movement data. The dataset used here utilizes a Nexus One Android smartphone, equipped with accelerometer sensor devices. The data was transformed and applied to two deep learning techniques: Convolutional Neural Network (CNN) and Long Short Term- Recurrent Neural Network (LSTM-RNN). The results obtained via CNN and LSTM-RNN are compared with the traditional classifiers such as k-Nearest Neighbor (kNN) and Feed Forward Neural Network (FFNN). The results show that the deep learning approaches were outperformed by the traditional classifiers on the applied dataset. While deep learning techniques reached a maximum accuracy of 84% utilizing LSTM, k-NN obtained an accuracy of 99.6%.



SP029

Time: 16:15-16:30

A Wavelet-based Data Analysis to Credit Scoring

Roberto Saia, Salvatore Carta and Gianni Fenu

University of Cagliari Department of Mathematics and Computer Science

Abstract:

Nowadays, the dramatic growth in consumer credit has made ineffective the methods based on the human intervention, aimed to assess the potential solvency of loan applicants. For this reason, the development of approaches able to automate this operation represents today an active and important research area named Credit Scoring. In such scenario it should be noted how the design of effective approaches represents an hard challenge, due to a series of well-known problems, such as, for instance, the data imbalance, the data heterogeneity, and the cold start. The Centroid wavelet-based approach proposed in this paper faces these issues by moving the data analysis from its canonical domain to a new time-frequency one, where this operation is performed through three different metrics of similarity. Its main objective is to achieve a better characterization of the loan applicants on the basis of the information previously gathered by the Credit Scoring system. The performed experiments demonstrate how such approach outperforms the state-of-the-art solutions.

GV005

Time: 16:30-16:45

Building Place-Specific Sentiment Lexicon
Youngmin Lee, Seula Park, Kiyun Yu and Jiyoung Kim

Seoul National University, Republic of Korea



ABSTRACT:

With the development of various smart applications, reviewing and grading places using location-based services has become a routine task among users. The user evaluations can significantly affect not only potential visitors, but also service providers. However, too much data interrupts people’s reasonable decision. In this paper, we propose a method to construct a place-specific sentiment lexicon by analyzing place reviews written by users. To this end, word2vec and association rule mining were used to extract place features and corresponding sentiment words, and sentiment word combinations were generated. Then, the probability values for each place-sentiment word combination were calculated through bag-of-words logistic regression. As a result, the place sentiment lexicon for 336 sentiment word combinations were constructed. This allows the context to be reflected in the sentiment analysis of places.

SP008-A

Time: 16:45-17:00

Ship Generated Acoustic Signal Detection Based on DEMON processing and Adaptive Median CFAR Algorithm

Dahai Cheng, Huigang Xu, Shuilin Tu, Ruiliang Gong and Huan Huang


Changshu Institute of Technology, China




Abstract:


This paper presented theoretic algorithms development and experimental research of DEMON processing based automatic detection of ship generated acoustic signals. In this paper, an

observation space is created by sampling and dividing input acoustic signal into multiple frames. Then, the envelope of the input signal is detected by creating a complex signal based on Hilbert transform, and finally the envelope signal of each frame is transformed into frequency domain. In the created observation space, a Median Constant False Alarm Rate (MCFAR) and post detection integration algorithms have been proposed for an effective automatic target detection of ship generated acoustic signals, in which a low constant false alarm rate is kept with relative high detection rate. The proposed algorithms have been tested on real ship generated acoustic signals. The statistical analysis and experimental results showed that the proposed algorithm has kept a very low false alarm rate and relatively high detection rate.

	<p>SP014</p> <p style="text-align: right;">Time: 17:00-17:15</p> <p>Research on Blind Beamforming Algorithm Based on Signal's Cyclostationary Ning Wang, Jianhong Xiang, Ming Li</p> <p>Harbin Engineering University, China</p> <p>Abstract: The blind beamforming algorithm based on the signal's cyclostationary can achieve the desired signal blind detection and recognition only by the known cycle frequency of the signal, so has been increasingly widely used in the field of signal processing. However, the estimation of the cyclic frequency of the signal is inaccurate in the actual situation, and the performance degradation of the algorithm increases with the increase of error. As for this, on the basis of the traditional blind beamforming algorithm(CAB) and the improved algorithm (F-CAB), it proposed a CAB algorithm with adaptive forgetting factor. The simulation results show that the proposed algorithm has strong robustness and adaptability to the cyclic frequency mismatch.</p>
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	<p>SP023</p> <p style="text-align: right;">Time: 17:15-17:30</p> <p>Low Probability of Intercept Radar Signal Recognition Based on the Improved AlexNet Model Xin Chen , Limin Guo</p> <p>Harbin Engineering University</p> <p>Abstract: In order to solve the problem that low recognition rate and less signal type of low probability of intercept (LPI) radar signal at -6dB of low signal-to-noise ratio (SNR), the paper presents a method based on Smooth Pseudo Wigner-Ville distribution (SPWVD) for signal time-frequency analyze and an improved-AlexNet deep convolutional neural network (DCNN) model for low probability of intercept radar signal to classification. First of all, the time-frequency images of radar signals are accessed by time-frequency analysis of SPWVD.</p>
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Next, to fit for input of the model size selected later and weaken the influence of noise, time-frequency images must be denoised and clipped processing by wavelet threshold filtering and bi-cubic interpolation. After that, employing TensorFlow frame and GPU to built improved-AlexNet and that accelerate the training of model. Last but not least, The model will extract feature and classify 10 type of radar signals include that CW, LFM, NLFM, BPSK, Costas, Frank, T1, T2, T3 and T4. The simulation results show that the overall correct recognition rate(CRR) of radar signals is 92.5% at -6dB that higher than existing methods.




SP038

Time: 17:30-17:45

Block Truncation Coding-based Audio Compression Technique
Ryan Rey M. Daga , Mark Daniel I. Dacles

University of the Philippines Visayas Tacloban College

Abstract:
 There have been an increasing utilization and consumption of audio files in various applications across different desktop and mobile devices. Thus, audio data compression has been beneficial in reducing the bandwidth and disk space requirements of such data. Block Truncation Coding (BTC), a well-known data compression technique for digital images, was used as the underlying algorithm in encoding audio data. A new encoding technique for audio data was proposed with the following components: (1) quadtree for audio block segmentation, (2) AMBTC for computation of representative values, and (3) Huffman Coding for lossless data representation. The performance of the proposed encoding technique was benchmarked and measured using Peak Signal-to-Noise Ratio (PSNR) and compression rate.




SP030

Time: 17:45-18:00

Delay-dependent Stability and Performance Analysis for Time Delay Systems Interconnected Over an Undirected Graph
Xiaojuan Xue, Huiling Xu, Li Xu

School of Science, Nanjing University of Science and Technology, Nanjing 210094, Jiangsu, P.R. China
 Department of Electronics and Information Systems, Akita Prefectural University, Akita, Japan


Abstract:
 Time delay is usually inevitable in a system consisting of spatially and/or wirelessly interconnected units or subsystems. This paper deals with the fundamental problem of stability and contractive performance for systems interconnected over an undirected graph with time delay in the states of subsystems. A sufficient condition for the well-posedness, delay-dependent stability and contractiveness of such systems is derived by means of

	finite-dimensional linear matrix inequalities (LMIs), which provides a useful tool for further exploration of the controller design problem. A numerical example is also presented to show the validity of the obtained results.
	<p>SP009</p> <p style="text-align: right;">Time: 18:00-18:15</p> <p>Query-Based Machine Learning Model for Data Analysis of Infrasonic Signals in Wireless Sensor Networks</p> <p>Chia-Yun Lee, Ray-I Chang, Chien-Chang Huang, Liang-Bin Lai</p> <p>National Taiwan University</p> <p>Abstract:</p> <p>As infrasonic signals can through objects and propagate at a long distance, infrasound sensors are widely applied in wireless sensor networks to monitor environment events of a large area. The signal conditions are usually complex and have various characteristics while monitoring the large area. Different features in both time and frequency domains should be extracted and considered. Big data increases the computation complexity, and the wrong selection of features may decreases the accuracy in event prediction. To overcome this problem, a query-based-learning method is applied to select the proper features for smart edge computing in machine learning. Experimental results show that the proposed method provides good performance when comparing with previous feature selection methods.</p>

Session4<Signal and Data Analysis>
Venue: Cattleya
Session Chair: Prof. Tae-Seong Kim
Time: 16:00-18:00

Note:

- The certification of Oral presentations will be awarded at the end of each session
- The certification of Best Presentation will be awarded at the end of each session
- The scheduled time for presentations might be changed due to unexpected situations, please come as early as you can.
- Session photo will be taken at the end of the session.

	<p>SP041</p> <p style="text-align: right;">Time: 16:00-16:15</p> <p>Sketch-based Cloud Model Retrieval for Cumulus Cloud Scene Construction</p> <p>Junping Chen</p> <p>Beihang University</p> <p>Abstract:</p> <p>Cumulus cloud scene is essential in many applications like movie production and 3D game</p>
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development. Realistic clouds with variant shapes are critical to enhancing the quality of virtual scenes. Therefore, many methods for constructing cumulus cloud scene have been proposed. However, current methods either require professional knowledge on modeling procedures and parameter adjusting, or only generate repetitive cloud shapes. It is a huge project even for experienced users to construct realistic cumulus cloud scene. Thus, it becomes a difficult task for novice users like movie producers and game designers. To address this problem, we propose a sketch-based retrieval system from pre-generated cumulus cloud models for cumulus cloud scene construction. In order to get realistic clouds, we first generate 3D cloud models from natural images, and construct a 3D cloud model database. Then the user is provided with an intuitive sketch interface for retrieving a cloud model with the desired shape and placed it at the desired position. Instead of retrieving 3D cloud volumes directly via 2D sketches, our method uses natural images in the database as index thus retrieval procedure is more robust and efficient. Our method allows novice users to intuitively design the desired and realistic cumulus cloud scene.



GV003

Time: 16:15-16:30

Designing of Indoor Linkable Pedestrian Network Data Model for the Transportation Vulnerable

Seula Park, Seongyong Kim and Kiyun Yu

Seoul National University, Korea

ABSTRACT:

There has been a recent increasing interest in guaranteeing the right for mobility of the transportation vulnerable and the demand for indoor routing services has been increasing as well. This paper proposes an indoor pedestrian network data model for navigation services for the transportation vulnerable. Based on the proposed network data model, it will be possible to design and construct indoor and outdoor network data in the future. In the proposed model, indoor ambulation facilities have been included and properties of the connecting facilities have been defined in detail, compared to the previous models.



SP007

Time: 16:30-16:45

3D Space Motion Dense Based Team Tactical Status Detection in Volleyball Game Analysis


Xina Cheng and **Takeshi Ikenaga**


Waseda University

Abstract:


In volleyball game analysis, the team tactical status plays an important role in analyzing game tactics, evaluation of team performance and developing team works for coach. In this paper, the team tactical status is classified into four categories: the *defensive ready*, the *defensive*, the *offensive ready* and the *attack*. The difficulties to detect one team tactical status from other


types including: 1) team rotations and player exchange, 2) different team formations, which make the same team tactical status have various features such as different player position and motion. This paper proposes a 3D space motion dense based team tactical status detection method to solve the complex features of team status. Instead using the local feature of each player, the 3D space motion dense feature describes the team status from two main aspects, the entire team motions relative to the court area and the relative motion of all the players to the ball. With the 3D ball trajectories and multiple players' positions tracked from multi-view volleyball game videos, the experimental result shows the detection accuracy reaches more than 80%.

	<p>SP046 Time: 16:45-17:00</p>
	<p>Video Steganography Using Karhunen-Loève Transform Goutam Sanyal ,Subhajit Roy, Srilekha Mukherjee</p> <p>National Institute of Technology, Durgapur, INDIA</p> <p>Abstract: Steganography is the art and science of message hiding i.e. passing confidential message through the unsecure channel in such a way that the existence of secret message is unknown. Image and video are the very popular choice for cover media. Embedding efficiency, payload and robustness against attackers are the main key point to successfully design a steganography algorithm. Current steganography algorithm are lacking behind by preprocessing stage, which includes alteration procedure for both cover media and secret message. We address this problem by proposing a novel method to encode the secret image inside the cover video. Here we use Karhunen-Loeve Transform (KL transform), since it provides the image compression and then after we use our proposed algorithm to embed the secret image on that compact zone. The experimental results show higher data embedding capacity and decode the secret image effectively.</p>

	<p>SP033 Time: 17:00-17:15</p>
	<p>Implementation of a CNN Accelerator on an Embedded SoC Platform Using SDSoC Sang-Soo Park, Kyeong-Bin Park, Ki-Seok Chung</p> <p>Hanyang University</p> <p>Abstract: Today, Convolution Neural Networks (CNN) is adopted by various application areas such as computer vision, speech recognition, and natural language processing. Due to a massive amount of computing for CNN, CNN running on an embedded platform may not meet the performance requirement. In this paper, we propose a system-on-chip (SoC) CNN architecture synthesized by high level synthesis (HLS). HLS is an effective hardware (HW) synthesis method in terms of both development effort and performance. However, the implementation</p>

should be optimized carefully in order to achieve a satisfactory performance. Thus, we apply several optimization techniques to the proposed CNN architecture to satisfy the performance requirement. The proposed CNN architecture implemented on a Xilinx’s Zynq platform has achieved 23% faster and 9.05 times better throughput per energy consumption than an implementation on an Intel i7 Core processor.

	<p>GV013</p> <p style="text-align: right;">Time: 17:15-17:30</p> <p>Statistical Analysis of Parameters for Torque-integrated Skinning</p> <p>Youngbeom Kim, Byoung-Ha Park, Kwang-Mo Jung</p> <p>Korea Electronics Technology Institute, Republic of Korea</p> <p>ABSTRACT:</p> <p>We propose the statistical analysis of parameters for example-based torque-integrated skinning methods. Recently, the physically-based linear blend skinning is proposed which is in the category of the example-based torque-integrated system. The physically-based linear blend skinning has linear scale/shear blending function and linear rotation blending function. In the current study, the degree of the polynomial blending functions is extended to three, i.e., it is either linear, quadratic, or cubic. We use the arm and leg model as experimental models. The evaluation results show that scale/shear blending function needs to be quadratic in the case of the leg.</p>
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	<p>SP047</p> <p style="text-align: right;">Time: 17:30-17:45</p> <p>Document Modeling with Hierarchical Deep Learning Approach for Sentiment Classification of online movie reviews</p> <p>Gautam Sanyal ,Monalisa Ghosh</p> <p>National Institute of Technology, Durgapur, INDIA</p> <p>Abstract:</p> <p>Sentiment analysis has recently been considered as most active research field in NLP domain. Deep learning is a growing trend of machine learning due to its automatic learning capability with impressive results across different NLP task. In this paper a model is proposed to analyze the deep sentiment representation based on CNN and LSTM (modified version of RNN) network. We aim to improve the performance of traditional machine learning method by merging them with deep learning techniques to tackle the challenge of sentiment prediction of massive amount of unsupervised product review dataset. The model allows pre trained word vector from text corpus with embedding algorithm. We make our model first learn to sentence representation with LSTM. Next, the semantics of sentences are encoded with convolutional neural network for document representation. We conduct experiments on two review datasets based on movie review with evaluation metric ‘accuracy’. The result shows that proposed model outperformed traditional machine learning as well as baseline neural network model</p>
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	<p>GV014</p> <p style="text-align: right;">Time: 17:45-18:00</p> <p>Command-Based Object Manipulation in Virtual Reality for Visualization and Design Tasks Matus Tuachob, Itthisek Nilkhamhang</p> <p>Thammasat University, Thailand</p> <p>ABSTRACT: In this paper, we describe the development of an interaction technique to manipulate multiple objects in VR, in context of a design software. The technique is developed specifically to reduce repetitive actions and aim to improve efficiency when designing in VR by assigning ‘command’ to multiple objects and let them execute it automatically, thus allowing the user to focus on the bigger picture. We first describe the idea and concept for the technique, then explain the implementation in Unreal Engine 4 (UE4) which was used to develop our software. We performed user tests with 30 subjects and discussed the result.</p>
	<p>GV024</p> <p style="text-align: right;">Time: 18:00-18:15</p> <p>Virtual Design and Construction: A New Communication in Construction Industry Hasnanywati Hassan, Nooriati Taib, Zainurul Abdul Rahman</p> <p>Universiti Sains Malaysia, Malaysia</p> <p>ABSTRACT: Construction projects involve a high degree of complex procurement processes. The increasing use of Virtual Design and Construction (VDC) is changing the way of working in the construction industry. VDC, a visual representation of data, is introduced for a better communication to clients in a clear and concise way. Its implementation in bidding stage is to support the construction planning in virtual environment and expected to improve efficiency, speed and accuracy. With the introduction of VDC follows the creation of new roles and new ways of communicating within the industry. The aim of this paper is to identify the application of VDC practices during bidding stage. This includes parties involved in the bidding stage, their perception on what bidding that applies VDC should possess and definition and perceived benefits of VDC. An interview was conducted in one of the Malaysia’s largest construction companies. The finding shows that there is high agreement concerning the goals of VDC within the company. A team of specialist and employees who possess VDC skills were employed. The company heavily invested on technology in order to be competitive and remains relevant. The environment of bidding that involves VDC presently is at infancy stage. Finally, the utilization of VDC in bidding stage and other stages of project cycle needs an active engagement and support from the government and all actors for it to reach its maturity.</p>

Poster Session

Time: Monday, February, 26, 2018 (13:30-18:15)

Location: Hotel Lobby

Note:

- The certification of Oral presentations will be awarded at the end of each session
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SP005

Smoking Activity Recognition Using a Single Wrist IMU and Deep Learning Light

Edwin Valarezo, Patricio Rivera, Sangmin Lee, Kyungmin Byun, Tae-Seong Kim

Kyung Hee University

Abstract:

Smoking has a strongly relation with diseases such as lung cancer, chronic obstructive pulmonary disease, and coronary heart disease. To prevent smoking, there are various passive ways including warning stickers and electronic cigarettes. However, a smart and proactive methodology might be more effective and useful to break the smoking habit by automatically and actively providing feedbacks to smokers to promote their desire of quitting smoking. In this work, we propose such a smart and proactive system using a wrist band housing a single Inertial Measurement Unit (IMU) sensor, and a smartphone App. housing artificial intelligence based on Recurrent Neural Network (RNN). To detect the smoking puffs, the proposed system uses a two steps classification scheme: first, a General model categorizes measured activities into Activities Daily Living (ADL) and Hand Gestures Activity (HGA). Then an Expert model further categorizes HGAs into smoking, eating, and drinking. Our smoking activity recognition system recognizes smoking activity with an accuracy of 91.38% and provides an active vibration feedback to smokers.



GV016

A Semantic Internet of Things Framework Using Machine Learning Approach Based on Cloud Computing

I-Ching Hsu, Pei-Wun Ding



National Formosa University, Taiwan

ABSTRACT:

A major limitation of existing Semantic Web applications is the lack of automatic generation linked data for personal needs. Internet of Things (IoT) can provide automatic sensing data to improve this limitation. The study addresses this issue by defining a Semantic Internet of Things Framework (SIOTF), which is implemented on Hadoop-based cloud computing ecosystem to provide efficiency in dealing with a mass of sensing data. The SIOTF is composed of four modules: Internet of Things module, Naïve Bayesian Classification module, Open Data Service module, and Semantic Web module. The proposed SIOTF is used to develop a Culture Sharing Cloud Platform (CSCP) that provides customized culture information for personnel needs. To demonstrate the feasibility of CSCP, the experimental results illustrate the efficiency and effectiveness of the proposed approach.

Dinner Banquet

Time: 18:30-20:00

Location: Dining Room (Note: Dinner coupon is required for the meal)

One Day Tour

Time: Tuesday (9:00-19:00)

Time	Agenda
9: 00	Gathering at the Hotel
9: 00-10: 30	Nijubashi Bridge
10: 30-12: 00	Senso-ji Temple
12: 00-14: 00	The Tsukiji Market
14: 00-15: 00	Odaiba Marin Park
15: 00-17: 00	Ginza
17: 00-18: 30	Tokyo Sky Tree
18: 30-19: 00	Back to Hotel

- Please arrive at the Hotel Lobby on time, the group will departure at 9:00 am punctually.

Senso-ji Temple is located in Taito Ward, Tokyo, is Japan's existing with "Edo style" of the public recreational land. According to legend, the Empress Suiko Sanshiliunian, there are two fishermen fishing in the Palace Togawa, picked up a gold one, 5.5 cm of Avalokitesvara, the vicinity of people built a temple to raise funds dedicated to the Buddha statues, and this is Senso-ji Temple.



Tokyo Sky Tree is a radio tower located in Sumida, Tokyo, Japan. The height of 634.0 meters, in November 17, 2011 Guinness World Records certified as "the world's tallest tower", becoming the tallest self-standing radio tower in the world. It is also the second tallest building in the world after Burj Khalifa in Dubai.

The Tsukiji Market is said that "Uogashi" or a riverside fish market dates back to the 16th century, the beginning of the Edo period. Tokugawa Ieyasu, the first Tokugawa shogun and builder of Edo as is now Tokyo, invited fishermen from Tsukudajima, Osaka and gave them a privilege for fishing in order to let them supply seafood to Edo Castle. The fishermen purveyed fish to the Castle and sold the remains near the Nihonbashi bridge. It was the origin of Uogashi.



Odaiba Marin Park is an artificial seaside park that can enjoy the views of the Tokyo coastline. Swimming is prohibited here, but it's available for visitors play on the coast and reef, you can also enjoy the windsurfing, overlooking the Rainbow Bridge across the street and other beautiful scenery.

NOTE: _____
