2020 International Artificial Intelligence and Blockchain Conference (AIBC 2020)

May 13-15, 2020

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Welcome Message from Organizing Committee

It is our great pleasure to invite you to join our international conference - 2020 International Artificial Intelligence and Blockchain Conference (AIBC 2020). This event will provide a unique opportunity for editors and authors to get together and share their latest research findings and results.

We're confident that over the two days you'll get the theoretical grounding, practical knowledge, and personal contacts that will help you build long-term, profitable and sustainable communication among researchers and practitioners working in a wide variety of scientific areas with a common interest in Artificial Intelligence and Blockchain Conference.

On behalf of all the conference committees, we would like to thank all the authors as well as the technical program committee members and reviewers. Their high competence, their enthusiasm, their time and expertise knowledge, enabled us to prepare the high-quality final program and helped to make the conference become a successful event.

In order to ensure the safety of each participant due to the serious of 2019-nCov, we finally decided to hold this meeting online. Thanks for all of your understanding and support!

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

Organizing Committee
May 2020

Conference Introductions

Welcome to 2020 AIBC conference. This conference is organized by ACM Chapter. The objective of the conference is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Artificial Intelligence and Blockchain Conference.

Papers will be published in the following proceeding:

International Conference Proceedings Series by ACM (ISBN 978-1-4503-7710-2), which will be archived in the ACM Digital Library, and indexed by Ei Compendex, Scopus and submitted to be reviewed by Thomson Reuters Conference Proceedings Citation Index (ISI Web of Science).

Conference website and email: http://www.aibc.org/ and aibc@acm-sg.org

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Keynote Speakers Introductions

Keynote Speaker I

Prof. Chin-Chen Chang
Feng Chia University, Taiwan

Prof. C.C. Chang obtained his Ph.D. degree in computer engineering from National Chiao Tung University. He's first degree is Bachelor of Science in Applied Mathematics and master degree is Master of Science in computer and decision sciences. Both were awarded in National Tsing Hua University. Dr. Chang served in National Chung Cheng University from 1989 to 2005. His current title is Chair Professor in Department of Information Engineering and Computer Science, Feng Chia University, from Feb. 2005.

Prior to joining Feng Chia University, Professor Chang was an associate professor in Chiao Tung University, professor in National Chung Hsing University, chair professor in National Chung Cheng University. He had also been Visiting Researcher and Visiting Scientist to Tokyo University and Kyoto University, Japan. During his service in Chung Cheng, Professor Chang served as Chairman of the Institute of Computer Science and Information Engineering, Dean of College of Engineering, Provost and then Acting President of Chung Cheng University and Director of Advisory Office in Ministry of Education, Taiwan.

Professor Chang's specialties include, but not limited to, data engineering, database systems, computer cryptography and information security. A researcher of acclaimed and distinguished services and contributions to his country and advancing human knowledge in the field of information science, Professor Chang has won many research awards and honorary positions by and in prestigious organizations both nationally and internationally. He is currently a Fellow of IEEE and a Fellow of IEE, UK. On numerous occasions, he was invited to serve as Visiting Professor, Chair Professor, Honorary Professor, Honorary Director, Honorary Chairman, Distinguished Alumnus, Distinguished Researcher, Research Fellow by universities and research institutes. He also published over 1,100 papers in Information Sciences. In the meantime, he participates actively in international academic organizations and performs advisory work to government agencies and academic organizations.

Keynote Speaker II

Prof. Qiangfu Zhao
University of Aizu, Japan

Prof. Qiangfu Zhao is a professor at the System Intelligence Laboratory, University of Aizu. I was an associate professor of this university from 1995 to 1999, associate professor of Tohoku University from 1993 to 1995, associate professor of Beijing Institute of Technology (BIT) from 1991 to 1993, and post-doctoral fellow at BIT from 1988 to 1991. His research is machine learning, which is an important branch in artificial intelligence (AI). The learning models he is using include neural networks (NNs), decision trees (DTs), and some hybrid models. So far he has studied learning of distance-based neural networks (DBNNs), induction of neural network trees (NNTrees), and induction of nearest neighbor classification trees (NNC-Trees), and got many interesting results. Currently, he is especially interested in applications of machine learning to face pattern recognition, document classification and analysis, development of user friendly systems, authentication of card holders, and so on. So far, He has published many refereed papers in journals and international conferences.

Keynote Speaker III

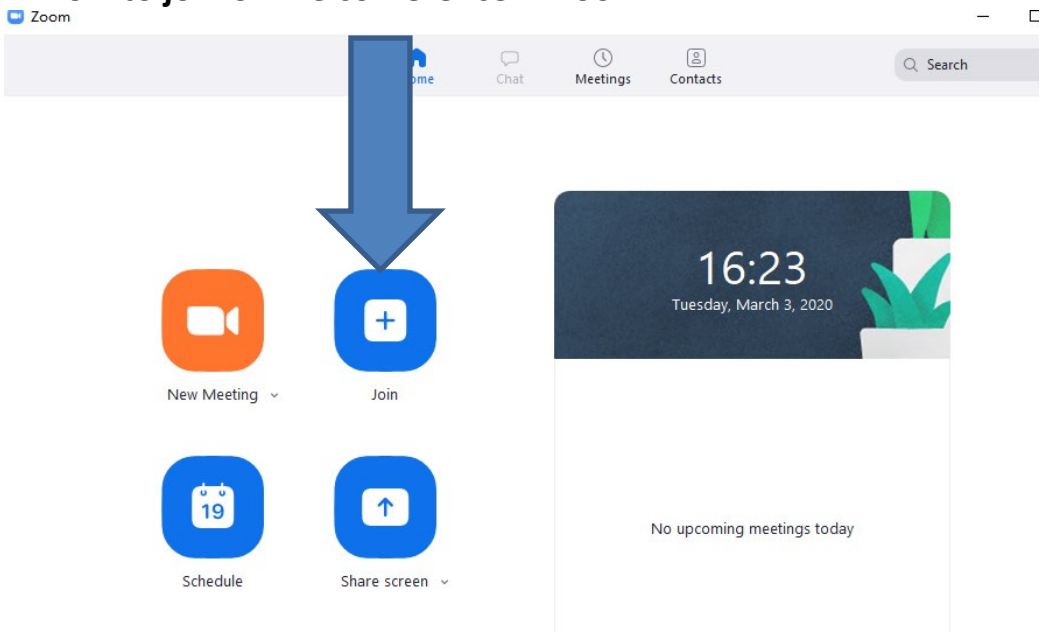
Prof. Sergei Gorlatch
University of Muenster, Germany

Prof. Sergei Gorlatch has been Full Professor of Computer Science at the University of Muenster (Germany) since 2003. Earlier he was Associate Professor at the Technical University of Berlin, Assistant Professor at the University of Passau, and Humboldt Research Fellow at the Technical University of Munich, all in Germany. Prof. Gorlatch has more than 200 peer-reviewed publications in renowned international books, journals and conferences. He was principal investigator in several international research and development projects in the field of parallel, distributed, Grid and Cloud algorithms, networking and computing, as well as e-Learning, funded by the European Commission and by German national bodies.

Instructions for The Online Tool "ZOOM"

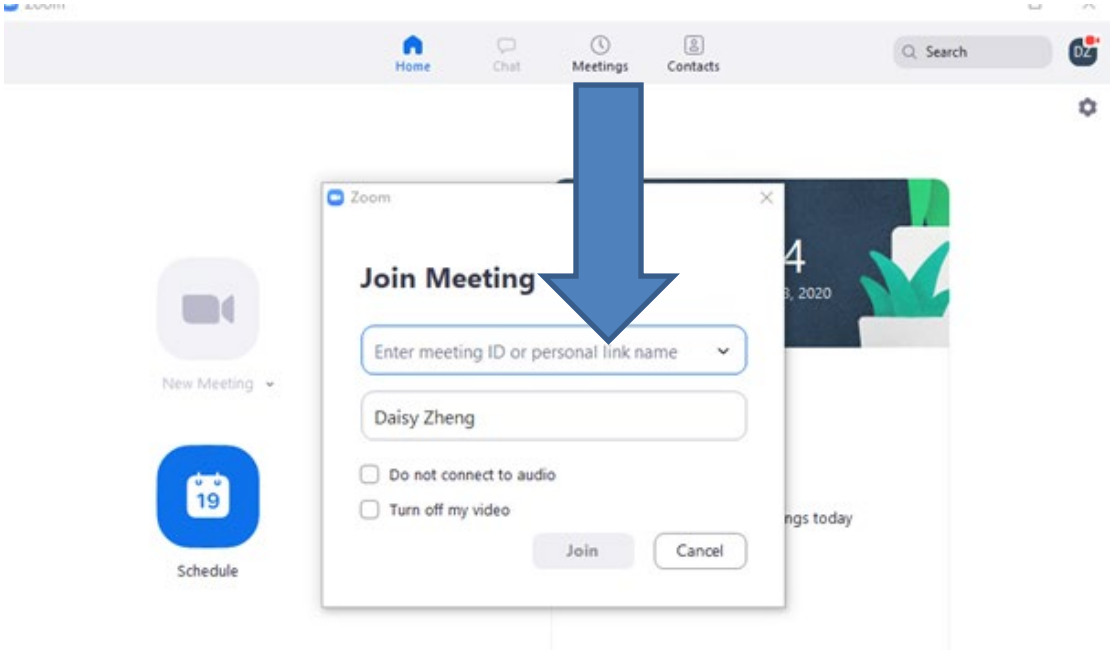
1. You can download the software "Zoom" from this URL:
http://www.zoom.us/

2. How to join online conference in Zoom



Please click "**join**"

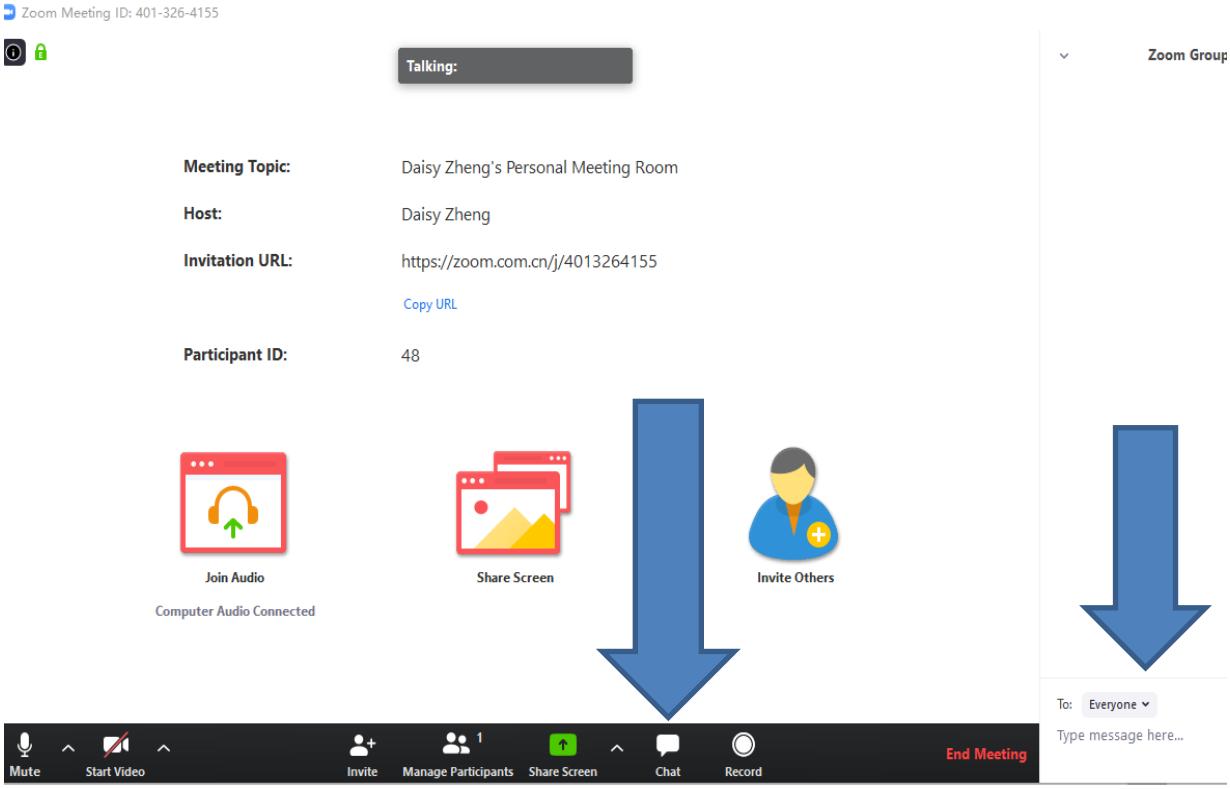
3. The Meeting ID for Morning Session and Afternoon Session



Please fill in the meeting ID **912-8681-2326 (Password: 905385)** and join the

online conference

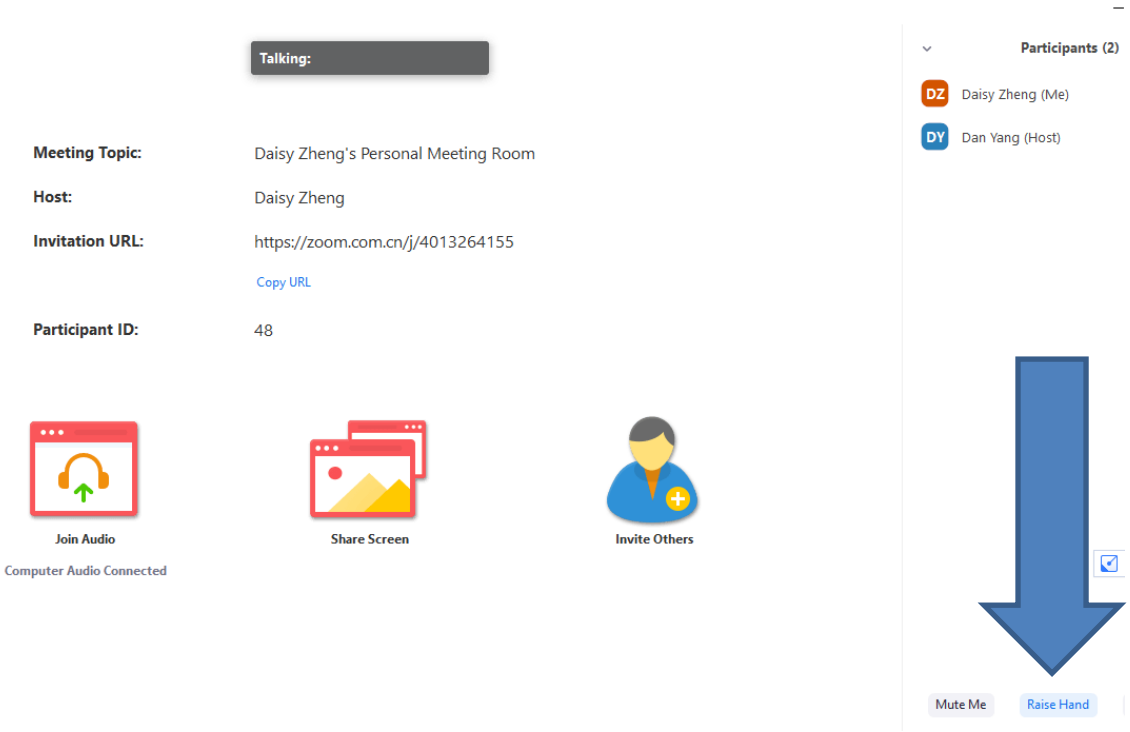
4. How to chat with others in Zoom:



You can click "**Chat**" first.

Then, you can click "**everyone**" to choose who you want to talk with.

5. How to raise our hands and ask questions in Zoom:

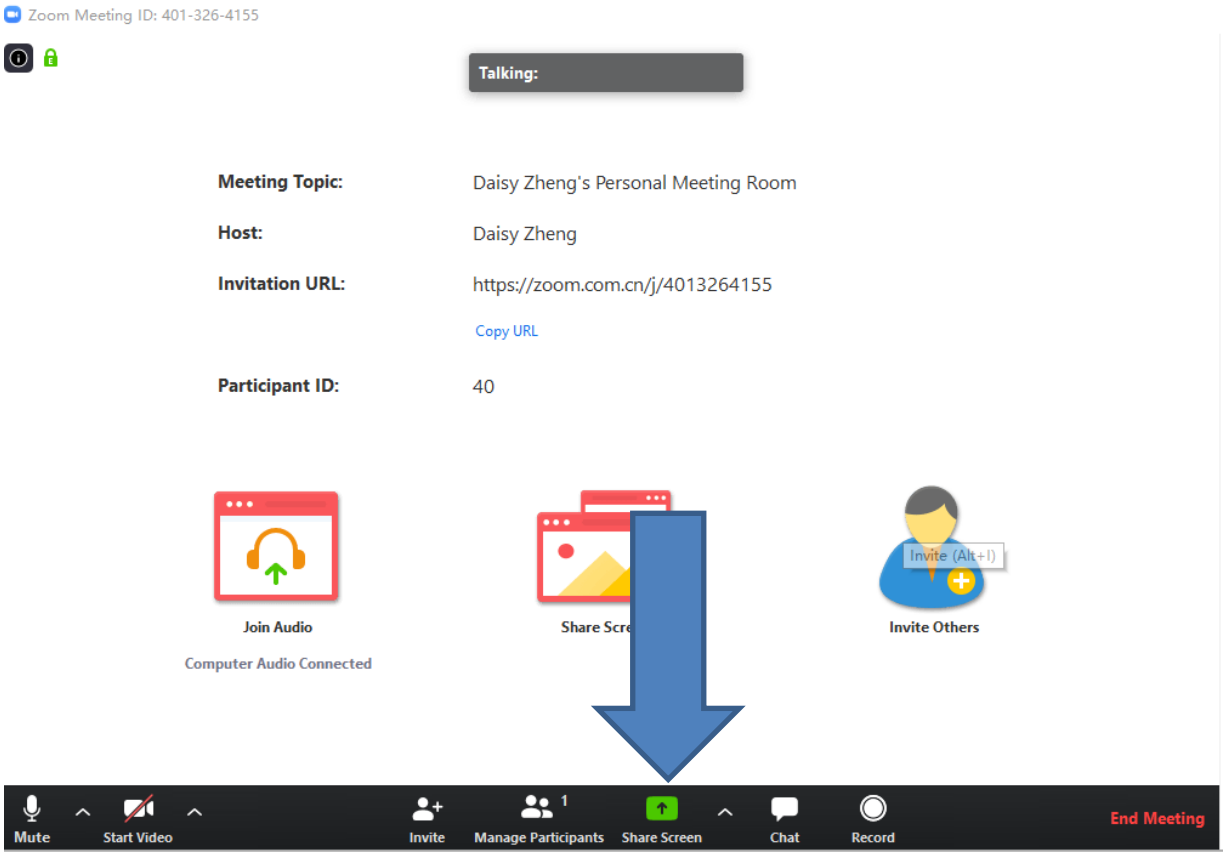


If you have any problems during the conference, you can click "**raise your hands**" or use "**chat** " to communicate with the conference secretary and the conference secretary will help you.

When you have questions about keynote speeches, you can also use "**raise your hands**".

After the keynote speech is over, keynote speakers will answer your questions.

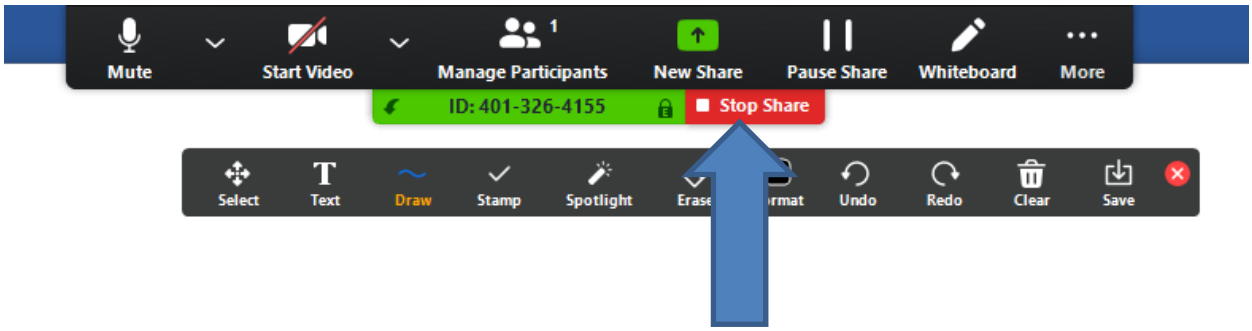
6. How to share your screen



When you do your presentation, you need to share your screen.

You can click "**share screen**".

7. How to stop sharing your screen



When your oral presentation is over, you can click "**stop share**".

Presentation Instructions

Instructions for Oral Presentations

Materials Provided by the Presenters:

PowerPoint or PDF Files

Duration of each Presentation (Tentatively):

Regular Oral Presentation: about **15 Minutes** of Presentation and **5 Minutes** of Question and Answer.

Best Presentation Award

One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded after each session.

Schedule for Conference

Tips: The time in the schedule is according to Japan time

May 13, 2020 (Wednesday) Room ID: 912-8681-2326 (Password: 905385)		
Online Test		
14:00- 16:30 (Japan Time)	14:00- 14:30	Presenters of Session 1 (AE0003, AE0001, AE0008, AE0016, AE0012, AE0018, AE5007)
	14:30- 15:00	Presenters of Session 4 (AE5014, AE5018, AE0015, AE5011, AE5013)
	15:00- 15:30	Prof. Chin-Chen Chang
	15:30- 16:00	Prof. Qiangfu Zhao
	16:00- 16:30	Prof. Sergei Gorlatch
	flex time	Any questions about the test, please contact the staff at other time on May 13 Afternoon.
May 14, 2020 (Thursday) Room ID: 912-8681-2326 (Password: 905385)		
Online Test		
10:00- 11:00 (Japan Time)	10:00- 10:30	Presenters of Session 2 (AE0023, AE0022, AE0013, AE0015, AE0005)
	10:30- 11:00	Presenters of Session 3 (AE0021, AE5002, AE5008, AE5012, AE5017, AE5010)
	flex time	Any questions about the test, please contact the staff at other time on May 14 Moring.
Keynote Speeches Session		
14:00- 16:30 (Japan Time)	14:00-14:10	Opening Remarks
	14:10-14:50	Keynote Speech I Title: Nature-Inspired Information Hiding Techniques Prof. Chin-Chen Chang, Feng Chia University, Taiwan
	14:50-15:30	Keynote Speech II Title: Awareness: Look at Intelligence from Another View Point Prof. Qiangfu Zhao, University of Aizu, Japan
	15:30-16:10	Keynote Speech III Title: Distributed Applications Based on Mobile Cloud Computing

		and Software-Defined Networks **Prof. Sergei Gorlatch, University of Muenster, Germany**
	16:10- 16:30	**Take a Break**
Afternoon: Session 1		
16:30- 18:50 **(Japan Time)**	**Session 1 (Room ID: 912-8681-2326) (Password: 905385)** **AE0003, AE0001, AE0008, AE0016, AE0018, AE5007, AE0012**	

May 15, 2020（Friday）		
Morning: Session 2		
10:30- 14:30 **(Japan Time)**	**10:30- 12:30**	**Session 2 (Room ID: 912-8681-2326) (Password: 905385)** **AE0023, AE0022, AE0013, AE0015, AE0005 ,AE0017**
	12:30- 14:30	**Lunch**
Afternoon: Session 3 & Session 4		
14:30- 18:30 **(Japan Time)**	**14:30- 16:30**	**Session 3 (Room ID: 912-8681-2326) (Password: 905385)** **AE0021, AE5002, AE5008, AE5012, AE5017, AE5010**
	16:30-16:50	**Take a Break**
	16:50- 18:30	**Session 4 (Room ID: 912-8681-2326) (Password: 905385)** **AE5014, AE5018, AE0015, AE5011, AE5013**

Keynote Speech Session (Thursday)

Afternoon, May 14, 2020

Time: 14:00-14:10 (Japan time)

Online-Meeting ID: 912-8681-2326 (Password: 905385)

Opening Remarks (14:00-14:10)
Addressed by Chair Prof. Chin-Chen Chang from Feng Chia University, Taiwan

Keynote Speech I (14:10-14:50)

Title: Nature-Inspired Information Hiding Techniques

Prof. Chin-Chen Chang
Feng Chia University, Taiwan

Abstract— Steganography is the science of secret message delivery using cover media. A digital image is a flexible medium used to carry a secret message because the slight modification of a cover image is hard to distinguish by human eyes. In this talk, I will introduce some novel steganographic methods based on different magic matrices. Among them, one method that uses a turtle shell magic matrix to guide cover pixels' modification in order to imply secret data is the newest and the most interesting one. Experimental results demonstrated that this method, in comparison with previous related works, outperforms in both visual quality of the stego image and embedding capacity. In addition, I will introduce some future research issues that derived from the steganographic method based on the magic matrix.

Keynote Speech II (14:50-15:30)

Title: Awareness: Look at Intelligence from Another View Point
Prof. Qiangfu Zhao
University of Aizu, Japan

Abstract— Awareness computing (AC) is a process for acquiring, distributing, and utilizing context information related to what happened in the past, what is happening now, and what will happen in the future, in the environment under concern. The main purpose of AC is to provide information in a timely manner so that a user (human or machine) can act or react proactively before something really happens. Instead of talking about AC applications, I would like to focus on some theoretic aspects of AC in this talk. First, I will introduce some basic concepts related to awareness and try to define aware systems formally. Then, I will describe some properties of aware systems, including the three-layered architecture and the three-valued outputs. Finally, I will propose some methods for realizing and interpreting aware systems.

Keynote Speech III (15:30-16:10)

Title: Distributed Applications Based on Mobile Cloud Computing and Software-Defined Networks
Prof. Sergei Gorlatch
University of Muenster, Germany

Abstract— We consider an emerging class of challenging networked multimedia applications called Real-Time Online Interactive Applications (ROIA). ROIA are networked applications connecting a potentially very high number of users who interact with the application and with each other in real time, i.e., a response to a user's action happens virtually immediately. T nypical representatives of ROIA are multiplayer online computer games, advanced simulation-based e-learning and serious gaming. All these applications are characterized by high performance and QoS requirements, such as: short response times to user inputs (about 0.1-1.5 s); frequent state updates (up to 100 Hz); large and frequently changing numbers of users in a single application instance (up to tens of thousands simultaneous users). This talk will address two challenging aspects of future Internet-based ROIA applications: a) using Mobile Cloud Computing for allowing high application performance when a ROIA application is accessed from multiple mobile devices, and b) managing dynamic QoS requirements of ROIA applications by employing the emerging technology of Software-Defined Networking (SDN).

Break Time: 16:10-16:30

Oral Presentation Abstracts (Thursday)

Session 1 (Room ID: 912-8681-2326) (Password: 905385)

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, May 14, 2020 (Thursday)

Time: 16:30-18:50 (Japan time)

Online-Meeting ID: 912-8681-2326 (Password: 905385)

AE0003 (Japan time 16:30-16:50)

Computation-Efficient Multi-Model Deep Neural Network for Sleep Stage Classification

Mingkai Xu[1], Xingjun Wang[1], Xiaoqing Zhang[2], Guangxiang Bin[1], Ziqian Jia[1] and Kexin Chen[1]
1. Tsinghua University, China; 2. Beijing Tongren Hospital, Capital Medical University, China

Abstract— We present a high performance and computation-efficient deep neural network method for automatic sleep stage classification. Using a multi-model integration strategy with multiple signal channels as input, we propose a method that automatically detects signal shedding and eliminates its effects. We designed a compact network, using bottleneck structure, depth-wise separable convolution, and shortcut connection, which dramatically reduces the number of parameters of the neural network model. Our approach has achieved significant improvements in multiple metrics on the Sleep-EDF dataset (accuracy 86.1%, mF1 81.1%, Cohen's Kappa 80.0%), while the number of model parameters is only several tenths of the other methods. We further explored the application of deep neural networks in automatic classification of sleep stage and laid the foundation for automated sleep analysis software to be applied on portable or wearable devices.

AE0001 (Japan time 16:50-17:10)

Analysis and Application of Financial News Text in Chinese Based on Bert Model

Zhixiong Tan, Bihuan Chen and Wei Fang
GF Securities, China

Abstract— The financial news text is distinguished from other corpus by its authoritativeness and characteristics. On the basis of customized text cleanup, fine-tune Bert model, segmentation and Chinese enterprise name database, we propose a new workflow framework in which realizing classification of news emotion, classification of financial negative event and related entity recognition for financial news text in Chinese. In general, Accuracy of the three types of models has compliance with application requirements. Subsequently, the financial news text in Chinese analysis system is designed and implemented on the purpose of full-cycle text analysis. The system consists of financial news collection module, financial news analysis module and financial news standardization and persistence module. Asynchronous design between financial news collection module and financial news analysis module ensures the scalability and sustainable optimization of system.

AE0008 (Japan time 17:10-17:30)

Cross-sectional Stock Price Prediction using Deep Learning for Actual Investment Management

Masaya Abe and Kei Nakagawa
Nomura Asset Management Co, Ltd, Japan

Abstract — Stock price prediction has been an important research theme both academically and practically. Various methods to predict stock prices have been studied until now. The feature that explains the stock price by a cross-section analysis is called a "factor" in the field of finance. Many empirical studies in finance have identified which stocks having features in the cross-section relatively increase and which decrease in terms of price. Recently, stock price prediction methods using machine learning, especially deep learning, have been proposed since the relationship between these factors and stock prices is complex and non-linear. However, there are no practical examples for actual investment management. In this paper, therefore, we present a cross-sectional daily stock price prediction framework using deep learning for actual investment management. For example, we build a portfolio with information available at the time of market closing and invest at the time of market opening the next day. We perform empirical analysis in the Japanese stock market and confirm the profitability of our framework.

AE0016 (Japan time 17:30-17:50)

Distant Supervised Relation Extraction Model for Reinforcement Learning Combined with Noise Network

Haihong E, **Xiaosong Zhou** and Meina Song
Beijing University of Posts and Telecommunications, China

Abstract — The distant supervised relation extraction has received wide attention from scholars in recent years. Existing methods for distant supervised relation extraction are based on bag-level for relation prediction, but they do not correspond to sentences and relation one by one. So in 2018, some scholars have proposed distant supervised relation extraction based on the sentence-level with reinforcement learning methods. Adding adaptive noise to the parameters of the reinforcement learning algorithm can effectively improve the performance of the algorithm. In this paper, the parametric noise is added to the neural network weights to increase the exploration of reinforcement learning. Experiments show that reinforcement learning with noise effectively improves the effect of distant supervised relation extraction based on the sentence-level.

AE0018 (Japan time 17:50-18:10)

On the Implementation of Business Process Logic in DLT Nodes

Thomas Osterland, Thomas Rose and Clemens Putschli
Fraunhofer FIT, Germany

Abstract — Distributed ledger technologies (DLT) enable new forms of business collaboration while the combination with smart contracts allows for an automation of business and collaboration processes. The immutability of DLT secures the execution of business processes. Hence, any process automation or resource management activities are tamper-proof. Yet, a widespread use can only take-off, if business process experts can directly use this new form of technology, since business process experts are not necessarily programming experts. Thus, we argue for a high-level business process modeling to allow an application-oriented formulation of business collaboration. Hence it is important to research the instantiation and execution of business processes on DLTs, which are formulated in conventional notations.

Existing approaches for process implementation on DLTs build-upon state machines that encode the process flow in smart contracts. Thereby every process instantiation requires the creation of a new smart contract with its state machine. In contrast we propose a variant of process implementation that builds-upon an extending kernel. The execution logic is encoded as a core function in the validation routine of DLT nodes. Going down this avenue, the process flow is specified inside transactions and the validation routine will ensure that the process is correctly executed. We validate the implementation of our approach and compare it to alternatives that implement processes by state machines across smart contracts.

AE5007 (Japan time 18:10-18:30)

Algorithm for Automatic Layout of Logo Pictures for Visualization of Ecological Map in Strategic Consulting

Meina Song, **Xiangyu Xu**, Haihong E and Yucheng Hu
Beijing University of Posts and Telecommunications, China

Abstract— The mapping of the industrial ecological map is an important work in strategic consulting services, but excessive artificial dependence has caused it to become a pain point for the digital transformation of strategic consulting. This paper proposed a method for the automatic layout of logo pictures to improve the efficiency of graph visualization. This paper improved the classic genetic algorithm, used inverse Polish expressions to represent the layout state, and combined the golden ratio and overall utilization as fitness functions to quickly generate the optimal ecological map. Finally, it was compared with artificial layout and violent layout, which proved the feasibility and superiority of the algorithm.

AE0012 (Japan time 18:30-18:50)

Call Attention to Stances: Detect Rumor with a Stance Attention Network

Lingyu Zeng, Bin Wu and Bai Wang
Beijing University of Posts and Telecomunications, China

Abstract — With the advent of web2.0 era, social media such as microblogging platforms have become important information distribution channels. Considering the amount of users on microblogging platforms, the rumor spreading on microblogging platform could have a negative effect on individuals, groups and the whole society. Hence, automatic rumor detection method is required. Stance features are a crucial for rumor detection, because users discussing rumors tend to express more querying and denying stances. However, different user stances have different importance. Motivated by this inspiration, in this paper, we propose a Rumor Detection Model with a Stance Attention Network (RDM-SAN). The RDM-SAN consists of three modules: stance module, rumor module and integrate module. The first module is a stance module, in which recurrent neural network and convolutional neural network are used to capture grammatical and event-related information released by individual users respectively. Then attention mechanism is leveraged to make sure that the most valuable information is contained in the event stance latent representation. The second module is a rumor module in which the content features and temporal features of a microblogging event are captured. The third module is an integrate module in which stance representations and rumor representations are concatenated together to detect rumors. Experiments on a real-world dataset from Weibo platform demonstrate that our proposed model RDM-SAN improves the performance of rumor detection in terms of both efficiency and accuracy compared to other methods, and the accuracy of our model achieves 94.6%.

Oral Presentation Abstracts (Friday)

Session 2 (Room ID: 912-8681-2326) (Password: 905385)

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Morning, May 15, 2020 (Friday)

Time: 10:30-12:10 (Japan time)

Online-Meeting ID: 912-8681-2326 (Password: 905385)

AE0023 (Japan time 10:30-10:50)

The Financial Derivative Ecosystem is Old - Decentralized Ledger Technology is its Fountain of Youth

Markus Paulson-Luna and Ken Reily
University of Minnesota, United States

Abstract— Financial derivatives are a crucial part of our global financial infrastructure. They serve as effective hedging tools and improve economic development, but conversely are complicated and subject to heavy regulation. Decentralized Ledger Technology (DLT) enables a distributed, trustworthy ledger that stores encrypted information. It could enable frictionless, transparent, financial derivative processing by creating an inherently trustworthy ecosystem that eliminates the need for transaction verification. This paper discusses how different DLT protocols could facilitate financial derivatives. We then present a protocol for facilitating financial derivatives using Stellar's DLT protocol. Assessing our protocol shows that it processes derivatives efficiently with complete transparency. Comparing our DLT based derivatives to traditional derivatives affirms our belief that DLT enables an increase in transparency and reduction of market friction. However, we also found that DLT based derivatives have increased security and counterparty risk. Overall, if the developer mitigates the risks associated with DLT, our protocol could enable a level 3 blockchain application to improve the financial derivatives ecosystem significantly.

AE0022 (Japan time 10:50-11:10)

BC-SSES: Secure storage extension and sharing method for blockchain

Hao Zhang, Tao Huang, **Yu Xia**, Jia Li, Haijin Wang, Wensong Zhang and Qiankun Zhou
Central China Normal University, China

Abstract— With the rise of blockchain technology, data sharing between organizations is often established in a distributed blockchain ledger that is decentralized and tamperproof and has a low trust cost. However, traditional blockchain technology does not adequately support the on-chain storage of massive data, and all the on-chain stored data are completely open and transparent to participants; consequently, it is impossible to meet the user's needs for privacy protection. In this study, we designed a scalable data access control method for blockchains; this method extends the storage forms of the blockchain to support the chaining and sharing of large files, ensures that the traceable data in the chaining process cannot be tampered with, and introduces the attribute authority mechanism in peer nodes to improve the reliability and efficiency of attribute authorization. To verify the correctness and security of the method, we built a complete prototype system based on the Hyperledger Fabric license chain and performed rigorous evaluations on the indicators of physical resource consumption and performance using the Hyperledger Caliper evaluation model. The results showed that the proposed method achieved a good balance in terms of performance, safety, and resource consumption indicators.

AE0013 (Japan time 11:10-11:30)

Towards Trust Enabled Commodity Market for Farmers with Blockchain Smart Contracts

Malni Kumarathunga, Rodrigo Calheiros and Athula Ginige
Western Sydney University, Australia

Abstract — This paper presents a conceptual model for an online agricultural commodity market that empowers farmers with a better price determination mechanism through collective marketing and Blockchain smart contracts. The model makes collective marketing possible by generating Many-one-Many relationships between farmers, farmers' groups, and buyers. While collective marketing improves farmers' bargaining position leading to higher rates, trust enabled by Blockchain smart contracts facilitates farmers to establish deals with buyers who offer the best rate transforming the commodity market into a sustainable market.

AE0015 (Japan time 11:30-11:50)

EBTree: A B-plus Tree Based Index for Ethereum Blockchain Data

Huang Xiaoju, Gong Xueqing, Huang Zhigang, Zhao Limei and **Gao Kun**
East China Normal University, China

Abstract — The emergence of smart contract promotes the popularity of blockchain applications, leading the dramatically growth of Ethereum blockchain data size. The analysis on blockchain data is urgently needed for users, e.g., collecting statistics of tokens, monitoring the status of Ethereum blockchain. However, Ethereum could only support simple searches on blockchain data on account of its storage model.

This paper proposes the EBTree, an index for Ethereum blockchain Data, and implements it based on Ethereum client (Geth1.8). With the properties of B+ tree, EBTree could support real-time top-k, range, equivalent search on Ethereum blockchain data. Besides, EBTree takes up relatively small storage space because it only stores the identifiers of blockchain data. Meanwhile, considering of the time intervals of mining block and synchronizing data from Ethereum network, the time of insertion in EBTree has little influence on the performance of Ethereum client. We conduct experiments to evaluate the performance of EBTree. According to the result of experiments, EBTree shows great performance on searches and insertion at low cost of storage.

AE0005 (Japan time 11:50-12:10)

A Variant Model of TGAN for Music Generation

Ping-Sung Cheng, Chieh-Ying Lai, Chun-Chieh Chang, Shu-Fen Chiou and Yu-Chieh Yang
National Taichung University of Science and Technology, Taiwan

Abstract — In the past five years, we have seen an increase in generative adversarial networks (GANs) and their applications for image generation. Due to the randomness and unpredictability of the structure of music, music generation is well suited to the use of GANs. Numerous studies have been published on music generation by using temporal GANs. However, few studies have focused on the relationships between melodies and chords, and the effects of latent space on time sequence.

We also propose a new method to implement latent structure on GANs for music generation. The main innovation of the proposed model is the use of new discriminator to recognize the time sequence of music and use of a pretrained beat generator to improve the quality of patterned melodies and chords. Results indicated that the pretrained model improved the quality of generated music.

AE0017 (Japan time 12:10-12:30)

Cultural Heritage Content Management System by Deep Learning

Sathit Prasomphan
King Mongkut's University of Technology North Bangkok, Thailand

Abstract — This research aims to develop a cultural heritage information management system with deep neural network. The cultural heritage information in case of Thai's architecture was used. The main contribution of this research was to develop an algorithm for retrieving information from image for telling story inside that image. The interesting information inside the image will be retrieved to present to the interested people who is interested in its contents. The development consists of telling stories from image. The appearance of the shape inside image can be used to distinct characteristics of image for example the era, architecture and style of image. The architecture was created including the story of the archaeological site through the learning of machine learning and image processing. The experimental results for a cultural heritage information management system with deep neural network was analyze by using the classification results of the proposed algorithms to classify era and architecture of the tested image. To test the performance of the purposed algorithms, images from the well-known historical area in Thailand were used which are image dataset in Phra Nakhon Si Ayutta province, Sukhothai province and Bangkok. The confusion matrix of the proposed algorithms gives the accuracy 80.67%, 79.35% and 82.47% in Ayutthaya era, Sukhothai era and Rattanakosin era. Results show that the proposed technique can efficiently find the correct descriptions compared to using the traditional method.

Lunch Time 12:30-14:30

Oral Presentation Abstracts (Friday)

Session 3 (Room ID: 912-8681-2326) (Password: 905385)

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Afternoon, May 15, 2020 (Friday)

Time: 14: 30-16: 30 (Japan time)

Online-Meeting ID: 912-8681-2326 (Password: 905385)

AE0021 (Japan time 14:30-14:50)

Research on Consumer Credit Portrait Intelligent Scoring Model

Xiujin Shi, **Kai Chen** and Junrui Zhang
China Donghua University, China

Abstract— In the field of credit scoring, there are traditional parallel and serial integration methods, which can accurately depict user portraits. However, the adjustment of hyperparameters and the comparison between hyperparameter optimization methods in previous integration models are always ignored, which is closely related to the performance of integration models. By establishing a credit scoring model based on Bayesian parameter optimization, the user's multidimensional data has been analyzed and the user's spending power is more accurately evaluated. The calculation results obtained by optimizing feature selection and parameter adjustment are accurate with other basic models. Which compared under the AUC index. The results show that the average performance of the model on the evaluation index is better than the benchmark model.

AE5002 (Japan time 14:50-15:10)

Security Risk Management Plan. Student portal - Case study

Gabriela Mogos
Xi'an Jiaotong-Liverpool University, China

Abstract — A student portal is a regularly utilized expression to describe the login page where students can give a username and password to access an instruction association's projects and other learning related materials. For instance, a student who has taken a crack at an online program may utilize a university portal to get to online course materials, for example, articles, lectures and recordings, facilitated on the school's data bases. university portal might be utilized to give data about the school, unique activities and events, course information, schedules, scholarly resources and contact data.
The paper presents several security issues that were detected at the Prince Sultan University, Riyadh, Saudi Arabia's portal. The Prince Sultan University (PSU) portal allows students to access the main website which is connected to PSU Moodle website and also connected to PSU Edugate website. Starting from the determined vulnerabilities, the paper presents a risk analysis of the sensitive data of a public institution, in cyberspace.

AE5008 (Japan time 15:10-15:30)

SnakeBotSaver: A Snake Robot Retrieving Sign of Life Utilizing Thermal Sensor

Eddel Jane Bartolay, **Jeffrey F. Calim**, Rizza Mae Corral, Arfel V. Aguilar and Marissa G. Chua
College of Computer Studies, Philippines

Abstract — Preventing and reducing risk of hazards in a natural disaster like Earthquake is unavoidable hence, there are government agencies that specialized in reducing risks while conducting the search and rescue operations. The SnakeBotSaver is designed to assist with the penetration of the specific area before the deployment of the search and rescue team. The project can use as rescue equipment and response to the team if ever there is a possible sign of human life through catching the actual footage of the camera and the output in thermal sensor attached to the head of the snake. The whole system is programmed and maintained by the operating system and language of the Raspberry Pi. This study aims to provide the best assistance for the search and rescue team of the City Disaster Risk Reduction Management Office (CDRRMO) to minimize the manpower in penetrating the specific location that is affected by the aftermath of an earthquake. This study also aims to provide a snake robot for search and rescue of CDRRMO by planning, developing, executing, and evaluating the system in terms of its functionality, reliability, efficiency, usability and maintainability. In concluding this study, the researchers attained a mean of 4.09 interpreted as acceptable based on Likert's Scale as a statistical tool used.

AE5012 (Japan time 15:30-15:50)

The impact of consumption value on tourist's intention to visit Thailand

Guo Lushan
Nanning university, China

Abstract — With both factor analysis and linear regression, the influence of consumer value on tourists' intention to visit Thailand was investigate by the questionnaire survey method. A prediction equation for tourists' plan to go to Thailand was given. The outcomes revealed that tourists' perception of consumption value could split into five dimensions, such as the new experience value, the societyvalue, the emotionvalue, the condition value, and the functionvalue. Therein, the newexperiencevalue, the condition value, and the function value had apositive influence on the tourist's intention to visit Thailand. While the societyand emotion value were not sufficient to impact the decision-making of tourism consumers to travel to Thailand.

AE5017 (Japan time 15:50-16:10)

Monitoring Call activity and Service Task Invocations for BPMN

Worranut Duangkeaw and Taratip Suwannasart
Chulalongkorn University, Thailand

Abstract— Currently, Service-Oriented Architecture (SOA) is used to integrate existing services, as it can significantly reduce time and redundancy in service development. Therefore, most organizations have widely adopted Business Process Model and Notation (BPMN) [1] in their process designs and simulation to verify business processes of the integrated services. A previous research proposed an approach for monitoring partner link invocations under WS-BPEL [2]. However, none of their studies has been conducted on call activity in BPMN. Thus, this paper proposes an approach to monitoring call activity and service task invocations for BPMN. This approach recognizes all any services and call activities that have not been tested, which monitors the imported and exported data of the service calls by using listener [3]. Therefore, existing test cases are analyzed to check all paths coverage in BPMN. Our approach also ensures the consistency of messaging services and testing the coverage of call activities and service task.

AE5010 (Japan time 16:10-16:30)

The Role of Knowledge Management on the Organizational Performance and Sustainable Competitive Advantage

Issa Shehabat
Yarmouk University, Jordan

Abstract — Now a days businesses are dramatically changing because of dynamic environments of technology and development, so that organizations should care and try to compete in their businesses by a continuous improvement of people, processes, capabilities, and performance, then to sustain their competitive advantage. To achieve this goal organizations should tend to utilize their resources, especially the intellectual resources. Since the knowledge is the vital asset in the organizations they use it to enrich the innovation and insights, to enhance the vision, mission and the strategies to ensure a superior organizational performance with a high profitability over competitors by effectively managing their knowledge. This work aims to illustrate the role of knowledge management(KM) and its processes to achieve the main goal of any organization which is a sustainable competitive advantage over competitors and how KM enhances the organizational performance.

Break Time 16:30-16:50

Oral Presentation Abstracts

Session 4 (Room ID: 912-8681-2326) (Password: 905385)

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

Morning, May 15, 2020 (Friday)

Time: 16: 50-18: 30 (Japan time)

Online-Meeting ID: 912-8681-2326 (Password: 905385)

AE5014 (Japan time 16:50-17:10)

Human-Neural Net Collaborative Programming

Peng Zhou, Yanjun Wu and Chen Zhao
University of Chinese Academy of Sciences

Abstract— Current program generation models suffer from the challenges of poor generalization, narrow program coverage and being incompetent to dealing with complex program structures (e.g., branch, loop, recursion.), because these models only get single information input (input-output samples) and rely entirely on neural networks. Obviously, there is ambiguity to reverse program behaviors through input-output pairs alone. Thus, we propose a Human-Neural Net Collaborative Programming (HNCP) paradigm, that integrates the strengths of human's experience and perception with the advantages of neural network's automatic learning from data, in which programmers compose the overall program framework, but let the neural network learn to generate the local trivial dirty detail. The advantages are to seamlessly integrate neural network components as a construction of advanced programming language, and to promote the practical application of program generation. Experiments indicate that our approach is effective and outperforms the state-of-the-art in program generation.

AE5018 (Japan time 17:10-17:30)

Test Case Impact Analysis for BPMN Input Changes

Phattanan Tippapharat and Taratip Suwannasart
Chulalongkorn University, Thailand

Abstract — Business Process Model and Notation (BPMN) was introduced to describe business processes and show sequence of each activity. Each BPMN input comprises of name, input type, and constraints. However, BPMN inputs may be changed during the process at any time. If these input changes relate to activities, test cases of these activities might be unusable. Therefore, it is necessary to update these test cases accordingly. Previous studies focused on many other aspects of BPMN except input change. Thus, this paper proposes an approach to analyze the impact of BPMN input changes on test cases. Our approach also applies a version control method to allows users to cancel the latest version of data and roll back to the previous one.

AE5015 (Japan time 17:30-17:50)

Configuring Appium for iOS Applications and Test Automation in Multiple Devices

Raiyan Rahman Chowdhury[1], Syeda Sumbul Hossain[2], Yeasir Arafat[2] and Bushrat Jahan Siddiqui[3]
1. Islamic University of Technology, Bangladesh; 2. Daffodil International University, Bangladesh;
3.Ahsanullah University of Science and Technology, Bangladesh

Abstract — With the ever-expanding of mobile technologies, maintaining software quality becomes a challenging job as a high volume of analyzes and high arrangements of features ought to be tested. Today, organizations are investing an expanding measure of energy and assets in guaranteeing the application is completely tried for the best client experience and ideal execution by the application. Automation in testing could be a great solution in this regard. Though there are mere tools for testing iOS applications, an open source mobile testing tool Appium is one of those. The purpose of this study is to discuss the detailed configuration of Appium for testing iOS applications and to address one of the major limitations of testing iOS applications using Appium, that is to test in multiple iOS devices using one Mac machine. This will support the iOS mobile industry to improve the quality of user experience by guiding the step by step set up of Appium for testing in commercial level and making it more cost effective.

AE5011 (Japan time 17:50-18:10)

A Framework for the Development of Computing-Assisted Health Surveillance among Drug Dependents in Davao City

Ceasar Ian P. Benablo[1] and Thelma Palaoag[2]
1. University of the Immaculate Conception, Philippines; 2. University of the Cordilleras, Philippines

Abstract — With the ongoing efforts of the Philippine Government in addressing drug-related problems in the society, issues like lack of healthcare service providers and medical facilities to offer rehabilitation programs has been detrimental to the success of these efforts. In this paper, we present a framework for the development of a health surveillance which takes advantage of the potential of inertial sensors in smartphones as well as other wearable devices in capturing physical and physiological data. These data are then analyzed in order to assess the rehabilitation progress and the overall rehabilitation outcome of drug-dependent individuals. The framework is composed of three main parts. First is sensing which covers the collection and transmission of data as well as pre-processing activities. Second is analysis which looks into both the physiological and physical data. It implements a DBN-based approach for the classification of physical activities. Frequency count is also captured. Lastly is results generation which provides healthcare service providers a means to better understand the data of individuals and assess their rehabilitation outcomes. Future works include the use of fewer bodily-sensors yet collecting the same amount of data, as well as the use of other sensors in collecting data.

AE5013 (Japan time 18:10-18:30)

Towards Implicit Memory Management for Portable Parallel Programming in C++

Vladyslav Kucher and Sergei Gorlatch
University of Muenster, Germany

Abstract — We consider the challenge of programming modern highperformance parallel processors including multi-core CPUs and many-core GPUs (Graphics Processing Units). Our approach is based on using the widely-spread programming language C++ in a portable way, i.e., the same program code runs on different target architectures. The contribution of this paper is that we extend our existing programming framework PACXX (Programming Accelerators in C++) with an additional compilation pass which allows to simplify the program data management for the programmer and makes the programming process less error-prone. We describe our current work in progress on implementing the implicit data management by presenting the major design choices and illustrating the advantages of our approach using simple programming examples.