

*2017 Intl. Conference on  
Intelligent Systems, Metaheuristics  
and Swarm Intelligence  
(ISMSI 2017)*

**Organized by:**



*Regal Oriental Hotel  
Hong Kong  
March 25-27, 2017*



# Contents

|   |    |
|---|----|
| Contents .....                              | 2  |
| Conference Venue .....                      | 4  |
| Simple Version of Conference Schedule ..... | 5  |
| Introduction to Speakers .....              | 7  |
| Registration Guide .....                    | 9  |
| Schedule of Morning Sessions .....          | 10 |
| Inauguration of IICCI & ISMSI .....         | 11 |
| Schedule of Afternoon Sessions .....        | 16 |
| Session I .....                             | 17 |
| Session II .....                            | 22 |
| Session III .....                           | 27 |
| Session IV .....                            | 31 |
| Poster Session .....                        | 35 |
| Author Index .....                          | 36 |

# Welcome to ISMSI 2017

Welcome to 2017 International Conference on Intelligent Systems, Metaheuristics & Swarm Intelligence.

The aim of ISMSI2017 is to present the latest research and results of scientists related to Intelligent Systems, Metaheuristics & Swarm Intelligence. The conference will provide opportunities for delegates from different areas to exchange new ideas and application experiences face to face, to establish business or research relations and to find global partners for future collaboration. We hope that the conference can make significant contributions to these up-to-date scientific fields. And wish all respected authors and listeners a nice trip in Hong Kong.

## Warm Tips:

- Get your presentation PPT prepared and print out the notification letter before you leave for Hong Kong.
- Pick up the conference materials at the reception desk in the lobby of Regal Oriental Hotel, from 10:00 a.m.-12:00 p.m., 01:30 p.m.-04:00 p.m. on March 25, 2017.
- Please attend the conference and arrive the conference room before 08:30 a.m. in formal attire on March 26, 2017.
- There will be a group photo between 9:20 a.m.-9:25 a.m. on March 26, 2017; every attendee will be invited to take group photo.
- Copy your PPT to the conference computer before your session begins. One best presentation will be selected from each session, and the best one will be announced and awarded during the dinner time(06:30 p.m.-08:00 p.m. in the evening of March 26, 2017 at Caf é Neo, B1). Session group photo will be taken after the session is over..
- The organizer won't provide accommodation, and we suggest you make an reservation.

# Conference Venue



## Regal Oriental Hotel



Add: 30-38 Sa Po Road, Kowloon City, Hong Kong

香港九龙沙浦道 30-38 号

Tel: (852)2718 0333

Fax: (852) 2718 4111

# Simple Version of Conference Schedule

| <b>March 25, 2017 (Saturday)</b>               |  |   |
|--|--|---|
| Time   | Venue  | Event   |
| 10:00 a.m.-12:00 p.m.<br>01:30 p.m.-04:00 p.m. | Lobby<br>(Ground Floor, Regal Oriental Hotel)                | Participants Registration & Conference Kits Collection  |
| <b>Morning of March 26, 2017 (Sunday)</b>      |  |   |
| 8:30 a.m.-10:00 a.m.                           | Conference Room I-III<br>(First Floor, Regal Oriental Hotel) | <b><i>Inauguration of IICCI &amp; ISMSI</i></b>   |
| 10:00 a.m.-10:15 a.m.                          |  | <b><i>Coffee Break</i></b>  |
| 10:15 a.m.-10:55 a.m.                          |  | Keynote Speech I:<br><b>Prof. Kwong Tak Wu Sam</b><br><i>City University of Hong Kong, Hong Kong</i><br>Title of Speech: Learning Multi-objective Optimizations using Evolutionary Algorithms   |
| 10:55 a.m.-11:35 a.m.                          |  | Keynote Speech II:<br><b>Prof. Meng-Hiot Lim</b><br><i>Nanyang Technological University, Singapore</i><br>Title of Speech: Embracing Metaheuristics Optimization in Pedagogical Engineering   |
| 11:35 a.m.-12:15 p.m.                          |  | Keynote Speech III:<br><b>Prof. Thomas Hanne</b><br><i>University of Applied Sciences and Arts Northwestern Switzerland, Switzerland</i><br>Title of Speech: Multiobjective Decision Making - Past, Present, and Future with a Focus on the Usage of Metaheuristics |
| 12:15 p.m.-01:30 p.m.                          | Café Neo<br>(B1, Regal Oriental Hotel)                       | <b><i>Lunch</i></b>   |

# Simple Version of Conference Schedule

| <b>Afternoon of March 26, 2017 (Sunday)</b> |   |  |
|---|---|--|
| Time  | Venue   | Event  |
| 01:30 p.m.-04:00 p.m.                       | <b>Conference Room I-III</b><br>(First Floor, Regal Oriental Hotel) | <b>Paper Presentation</b><br>Session I- Computer science and Information Engineering<br>(10 papers)<br>Session Chair: <b>Meng-Hiot Lim</b>       |
| 03:45 p.m.-04:10 p.m.                       |   | <b>Coffee Break</b>  |
| 04:10 p.m.-05:40 p.m.                       |   | <b>Paper Presentation</b><br>Session III- Machine Learning<br>(6 papers)<br>Session Chair: <b>Toshiaki Omori</b>                                 |
| 01:30 p.m.-03:45 p.m.                       | <b>Conference Room IV</b><br>(First Floor, Regal Oriental Hotel)    | <b>Paper Presentation</b><br>Session II- Algorithm Design and Optimization<br>(9 papers)<br>Session Chair: <b>Yukiko Orito</b>                   |
| 03:45 p.m.-04:10 p.m.                       |   | <b>Coffee Break</b>  |
| 04:10 p.m.-05:55 p.m.                       |   | <b>Paper Presentation</b><br>Session IV- Mechanical manufacturing and control<br>engineering<br>(7 papers)<br>Session Chair: <b>Thomas Hanne</b> |
| 06:30 p.m. -08:00 p.m.                      | <b>Café Neo</b><br>(B1, Regal Oriental Hotel)                       | <b>Dinner</b>  |

# Introduction to Dignitaries and Keynote Speakers

## Chief Guest & Keynote Speaker I



**Prof. KWONG, Tak Wu Sam**

*City University of Hong Kong, Hong Kong*

**Biography:** Prof Kwong joined City University as a lecturer in the Department of Electronic Engineering in 1989. Before joining City University, he worked for Control Data Canada and Bell Northern Research as diagnostic engineer and member of Scientific Staff, respectively. Besides being elected a Fellow of IEEE, at present, he is the associate editor of the IEEE transactions on Industrial Informatics and IEEE Transactions on Industrial Electronics, Journal of Information Sciences. He is also the Admissions Officer for the graduate programme in the Department. His research interests are evolutionary algorithms, pattern recognition, digital watermarking, video coding and network intrusion systems.

## Guest-of-Honor & Keynote Speaker II



**Prof. Meng-Hiot Lim**

*Nanyang Technological University, Singapore*

**Biography:** Meng-Hiot Lim is a faculty member at the School of EEE, Nanyang Technological University, Singapore. He grew up in Malaysia and pursued his tertiary education at the University of South Carolina, USA. Dr Lim is the Managing Editor-in-Chief of Memetic Computing journal and a Chief Editor of the Book Series on Adaptation, Learning and Optimization (ALO). He is also the Chief Editor of the book series on Proceedings of ALO. While his current research is mainly in the field of memetic computation and data analytics, he is also passionate about pedagogical engineering. His interests also include nurturing entrepreneurship, and is the co-founder of several startup companies. He is the founder and President of Memetic Computing Society, a professional body that promotes research and socio-educational activities related to the area of meme-centric problem-solving. He has 10 patents and previously served as a founding co-director of the Financial Engineering graduate program at the Nanyang Business School. He also plays an active role as organizer of the series of annual ELM(12-16) conferences.

## Guest-of-Honor & Keynote Speaker III



**Prof. Thomas Hanne**

*University of Applied Sciences and Arts Northwestern Switzerland, Switzerland*

**Biography:** Thomas Hanne received master's degrees in Economics and Computer Science, and a PhD in Economics. From 1999 to 2007 he worked at the Fraunhofer Institute for Industrial Mathematics (ITWM) as senior scientist. Since then he is Professor for Information Systems at the University of Applied Sciences and Arts Northwestern Switzerland and Head of Competence Center Systems Engineering since 2012.

Thomas Hanne is author of more than 100 journal articles, conference papers, and other publications and editor of several journals and special issues. His current research interests include multicriteria decision analysis, evolutionary algorithms, metaheuristics, optimization, simulation, systems engineering, software development, logistics, and supply chain management.



# Registration Guide

**March 25, 2017-----Onsite Registration**

**Venue:** Ground Floor, lobby, Regal Oriental Hotel

**Time:** 10:00 a.m. -04:00 p.m.

## Registration Steps

1. Arrive at the Lobby of hotel



2. Inform the conference staff of your paper ID



3. Sign your name on the Participants List



4. Sign your name on Lunch & Dinner requirement list



5. Check your conference kits: (1 conference program, 1 lunch coupon, 1 dinner coupon, 1 receipt, 1 name card, 1 CD or USB (papers collection), 1 computer bag or 1 souvenir)



6. Finish registration

# Schedule of Morning Sessions

March 26, 2017 Morning

| Venue  | Time                  | Event   |
|--|-----------------------|---|
| <b>Conference Room I-III</b><br><b>First Floor, Regal Oriental</b><br><b>Hotel</b> | 08:30 a.m.-10:00 a.m. | Inauguration of IICCI & ISMSI   |
|  | 10:00 a.m.-10:15 a.m. | <i>Coffee Break</i>   |
|  | 10:15 a.m.-10:55 a.m. | Keynote Speech I<br><i>Prof. Kwong, Tak Wu Sam</i><br>Title: Learning Multi-objective Optimizations using Evolutionary Algorithms       |
|  | 10:55 a.m.-11:35 a.m. | Keynote Speech II<br><i>Prof. Meng-Hiot Lim</i><br>Title: Embracing Metaheuristics Optimization in Pedagogical Engineering              |
|  | 11:35 a.m.-12:15 p.m. | Keynote Speech III<br><i>Prof. Thomas Hanne</i><br>Title: University of Applied Sciences and Arts Northwestern Switzerland, Switzerland |

# Inaugural Session

Venue: Conference room I-III, First Floor, Regal Oriental Hotel  
March 26, Sunday Morning

Time: 8:30 a.m.-10:00 a.m.

| <b>Inauguration of ICCI</b> |  |
|-----------------------------|--|
| 8:30 a.m.-8:35 a.m.         | Video Address by<br><b>Prof. Lalit Mohan Patnaik</b><br>Indian Inst. of Science, Bangalore, India  |
| 8:35 a.m.-8:40 a.m.         | Video Address by<br><b>Prof. Janusz Kacprzyk</b><br>Polish Academy of Sciences, Poland   |
| 8:40 a.m.- 8:50 a.m.        | Address by<br><b>Prof. Thomas Hanne</b><br><b>Guest-of-Honor</b><br>University of Applied Sciences and Arts Northwestern Switzerland,<br>Switzerland |
| 8:50 a.m.-9:00 a.m.         | Address by<br><b>Prof. John MacIntyre</b><br><b>Chief Guest</b><br>Hon'ble Pro Vice Chancellor, University of Sunderland, UK                         |
| 9:00 a.m.-9:05 a.m.         | Endorsement of ICCI  |

|                                   |  |
|-----------------------------------|--|
| 9:05 a.m.-9:15 a.m.               | Address by<br><b>Prof. Suash Deb</b><br><b>General Chair-ISMSI 2017</b><br>Founding Secretary General, IICCI   |
| 9:15 a.m.-9:20 a.m.               | Vote-of-Thanks by<br><b>Dr. Ajay Kaul</b><br>Shri Mata Vaishno Devi University, Jammu, India   |
| 9:20 a.m.-9:25 a.m.               | Group Photo  |
| <b>Inauguration of ISMSI 2017</b> |  |
| 9:25 a.m.-9:30 a.m.               | Welcome address by<br><b>Prof. Suash Deb</b><br><b>General Chair-ISMSI 2017 &amp; Secretary General- IICCI</b>                                       |
| 9:30 a.m. - 9:40 a.m.             | Address by<br><b>Prof. Kwong, Tak Wu Sam</b><br><b>Chief Guest-ISMSI 2017</b><br>City University of Hong Kong, Hong Kong                             |
| 9: 40a.m. - 9:50 a.m.             | Address by<br><b>Prof. Meng-Hiot Lim</b><br><b>Guest-of-Honor-ISMSI 2017</b><br>Nanyang Technological University, Singapore                          |
| 9:50 a.m.-9:55 a.m.               | Address by<br><b>Prof. Thomas Hanne</b><br><b>Guest-of-Honor</b><br>University of Applied Sciences and Arts Northwestern Switzerland,<br>Switzerland |
| 9:55 a.m.-10:00 a.m.              | Vote-of-thanks by<br><b>Dr. Ka Chun Wong</b><br><b>Organizing Chair-ISMSI 2017</b><br>City University of Hong Kong, Hong Kong                        |



**Coffee Break**

**10:00 a.m.-10:15 a.m.**

# Keynote Speeches

**Time: 10:15 a.m.-12:15 p.m.**



**Prof. Kwong, Tak Wu Sam**

*City University of Hong Kong, Hong Kong*

**Title of Speech:** Learning Multi-objective Optimizations using Evolutionary Algorithms

**Abstract:** Multiobjective problems are always aroused in our daily life in that we have to make decisions based on many different objectives. Recently, Multiobjective evolutionary algorithm based on decomposition (MOEA/D) decomposes a multiobjective optimization problem into a set of scalar optimization subproblems and optimizes them in a collaborative manner. This approach has been proved to be the state of the art method in solving multi-objective/many objective problems. In this talk, I will try to present the audiences a number of learning techniques for solving these kinds of problems with an example on applying stable matching to MOEA/D but not limited to Multiobjective evolutionary algorithms. In MOEA/D, subproblems and solutions are modelled as two sets of agents for matching. Thus, this kind of selection of promising solutions for subproblems can be regarded as a matching between subproblems and solutions. This problem could be viewed as a Stable matching problem as for school admission, hospital residents problems. Also, it can effectively resolve conflicts of interests among selfish agents in the economic market. In this talk, I will advocate the use of a simple and effective stable matching (STM) model to coordinate the selection process in MOEA/D. In this model, subproblem agents can express their preferences over the solution agents, and vice versa. The stable outcome produced by the STM model matches each subproblem with one single solution, and it tradeoffs convergence and diversity of the evolutionary search. In addition, a two-level stable matching-based selection is proposed to further guarantee the diversity of the population. More specifically, the first level of stable matching only matches a solution to one of its most preferred subproblems and the second level of stable matching is responsible for matching the solutions to the remaining subproblems. Experimental studies demonstrate that the proposed selection scheme is effective and competitive comparing to other state-of-the-art selection schemes for MOEA/D.

**Keynote Speech I**  
10:15 a.m.-10:55 a.m.



**Prof. Meng-Hiot Lim**

*Nanyang Technological University, Singapore*

**Title of Speech:** Embracing Metaheuristics Optimization in Pedagogical Engineering

**Abstract:** It is said that innovation is an instinctive survival trait which is a result of limitation in resources. It is the driving force that makes us want to do things differently, albeit in a more “cost” effective manner. In this sense, optimization is synonymous to innovation. As such, the concept of optimization should be appreciated at all levels, from primary to tertiary level students.

Metaheuristics is an appealing concept which if conveyed effectively can stimulate the minds of students in connecting with real-world scenarios. To achieve this objective, it is crucial to have in place a holistic approach that engages students from ground level upstream activities all the way to downstream deployment validation. In this talk, I will share some ideas on how pedagogical engineering can be made more engaging and stimulating through an intellectually and physically scalable “build and learn” framework. I will use as case studies some examples of NP-hard optimization problems to illustrate how generic tools such as Excel, can be used to expose students or industrial practitioners to the practices of metaheuristics optimization before progressing on to more sophisticated algorithms configuration tool. I will also present some demonstrative real-life activities to show that besides its value from a pedagogical standpoint, such a framework inherently promotes the spirit of resource and technical accountability on the part of the learner.

**Keynote Speech II**  
10:55 a.m.-11:35 a.m.

**Keynote Speech III**  
11:35 a.m.-12:15 p.m.



**Prof. Thomas Hanne**

*University of Applied Sciences and Arts Northwestern Switzerland, Switzerland*

**Title of Speech:** Multiobjective Decision Making - Past, Present, and Future with a Focus on the Usage of Metaheuristics

**Abstract:** The presentation gives a broad overview of the historical development of multiobjective decision making from early origins and its establishment as a distinct research field in the 1970s up to a mature discipline which we find today. This development led to a large number of different approaches which reflect the multidisciplinary nature of this science. Methodological contributions come from diverse fields such as mathematics, economics, engineering, psychology and other disciplines. Moreover, we put particular emphasis on utilizing metaheuristics for solving multi-objective problems and discuss necessary steps to convert a single-objective approach into a multiobjective one. The presentation concludes with an outlook on possible future research directions.



**Lunch Time: 12:15 p.m.-1:30 p.m.**

**Venue: Café Neo**

**(B1, Regal Oriental Hotel)**

# Schedule of Afternoon Sessions

**March 26, 2017 Afternoon**

\*\*Please check the venue of your session and go to the corresponding room before your session starts

| <b>Venue</b>  | <b>Time</b>           | <b>Event</b>   |
|---|-----------------------|--|
| <b>Conference Room I-III</b><br>First Floor, Regal Oriental Hotel | 01:30 p.m.-04:00 p.m. | Session I<br>Computer Science and Information Engineering<br>(10 papers)     |
|   | 03:45 p.m.-04:10 p.m. | <b><i>Coffee Break</i></b>   |
|   | 04:10 p.m.-05:40 p.m. | Session III<br>Machine Learning<br>(6 papers)                                |
| <b>Conference Room IV</b><br>First Floor, Regal Oriental Hotel    | 1:30 p.m.-03:45 p.m.  | Session II<br>Algorithm Design and Optimization<br>(9 papers)                |
|   | 03:45 p.m.-04:10 p.m. | <b><i>Coffee Break</i></b>   |
|   | 04:10 p.m.-05:55 p.m. | Session IV<br>Mechanical Manufacturing and Control Engineering<br>(7 papers) |



## Session I- Computer Science and Information Engineering



(10 papers, each paper has 13 minutes for presentation, 2 minutes for Q&A)




**Venue: Conference Room I-III, First Floor, Regal Oriental Hotel**

**Time: 01:30 p.m.-04:00 p.m.**

**Session Chair: Meng-Hiot Lim**

**\*\*Duration of each presentation is just for reference. We suggest presenters to attend the whole session, just in case the actual presentation time may differ from the scheduled time.**

|   |  |
|---|--|
| <p>ISMSI2017-113<br/>01:30 p.m.-01:45 p.m.</p>  |  <p><b>Presenter:</b> Hiroki Nakajima<br/><b>From:</b> Kyoto Institute of Technology, Japan</p> <p><b>Title:</b> The Solution of Combinatorial Optimization Problems Based on Reinforcement Learning</p> <p><b>Authors:</b> Hiroki Nakajima, Hitoshi Iima</p> <p><b>Abstract:</b> Combinatorial optimization problems are known as important ones which can be applied to various fields. However, there is a problem that it is difficult to find an optimal solution, especially for a large-scale combinatorial optimization problem.</p> <p>Meanwhile, in the field of machine learning, reinforcement learning has attracted attention because learning is achieved rapidly and optimally. In this paper, we propose a method in which the basic framework of the reinforcement learning is introduced, for solving the combinatorial optimization problems.</p>  |
| <p>ISMSI2017-234A<br/>01:45 p.m.-02:00 p.m.</p> |  <p><b>Presenter:</b> Soyeong Jeong<br/><b>From:</b> Ulsan National Institute of Science and Technology, Republic of Korea</p> <p><b>Title:</b> Newton Particle Method for Global Optimization</p> <p><b>Authors:</b> Soyeong Jeong and Pilwon Kim</p> <p><b>Abstract:</b> This paper proposes a new deterministic technique for a population-based optimization, a Newton Particle Optimizer(NPO). The algorithm uses the Newton method with a guiding function and drives particles toward the best known positions. The particles' movements are influenced by the fractal nature of the Newton method and greatly diversified in approaching to the temporal best solutions. As a result, NPO generates a wide variety of searching paths, achieving a balance between exploration and exploitation. The performance of the proposed optimizer is demonstrated for various test functions and is compared with the particle swarm optimizer in computation efficiency.</p> |

|   |  |
|---|--|
| <p>ISMSI2017-108<br/>02:00 p.m.-02:15 p.m.</p>  | <div style="text-align: center;">  <p><b>Presenter:</b> Erion Çano<br/><b>From:</b> Polytechnic University of Turin, Italy</p> <p><b>Title:</b> MoodyLyrics: A Sentiment Annotated Lyrics Dataset</p> <p><b>Authors:</b> Erion Çano and Maurizio Morisio</p> <p><b>Abstract:</b> Music emotion recognition and recommendations today are changing the way people find and listen their preferred musical tracks. Emotion recognition of songs is mostly based on feature extraction and learning from available datasets. In this work we take a different approach utilizing content words of lyrics and their valence and arousal norms in affect lexicons only. We use this method to annotate each song with one of the four emotion categories of Russell's model, and also to construct MoodyLyrics, a large dataset of lyrics that will be available for public use. For evaluation we utilized another lyrics dataset as ground truth and achieved an accuracy of 74.25 %. Our results confirm that valence is a better discriminator of mood than arousal. The results also prove that music mood recognition or annotation can be achieved with good accuracy even without subjective human feedback or user tags, when they are not available.</p> </div> |
| <p>ISMSI2017-106<br/>02:15 p.m.-02:30 p.m.</p>  | <div style="text-align: center;">  <p><b>Presenter:</b> Ajay Koul<br/><b>From:</b> Shri Mata Vaishno Devi University, India</p> <p><b>Title:</b> Quality of Service Oriented Secure Routing Model for Mobile Ad hoc Networks</p> <p><b>Authors:</b> Ajay Koul, Harinder Kaur</p> <p><b>Abstract:</b> Mobile Ad hoc Networks (MANETs) always bring challenges to the designers in terms of its security deployment due to their dynamic and infrastructure less nature. In the past few years different researchers have proposed different solutions for providing security to MANETs. In most of the cases however, the solution prevents either a particular attack or provides security at the cost of sacrificing the QoS. In this paper we introduce a model that deploys security in MANETs and takes care of the Quality of Services issues to some extent. We have adopted the concept of analyzing the behavior of the node as we believe that if nodes behave properly and in a coordinated fashion, the insecurity level goes drastically down. Our methodology gives the advantage of using this approach</p> </div>  |
| <p>ISMSI2017-112<br/>02:30 p.m. -02:45 p.m.</p> | <div style="text-align: center;">  <p><b>Presenter:</b> Keiko Ono<br/><b>From:</b> Ryukoku University, Japan</p> <p><b>Title:</b> Empirical Analysis of Volatility Forecasting Model based on Genetic</p> </div>   |

|   |   |
|---|---|
|   | <p style="text-align: center;">Programming</p> <p><b>Authors:</b> Naoki Toriyama, Keiko Ono and Yukiko Orito</p> <p><b>Abstract:</b> In financial markets, the variance of stock returns plays an important role to reduce a risk, and daily volatility is often used as one of its measurement. We in this paper focus on Realized Volatility (RV), which is one of the most well-known volatility index. Traditionally regression models have been widely used to estimate it, but Genetic Programming (GP) approaches have been proposed recent years. While regression models estimate a suitable equation for forecasting RV, GP approaches estimate a tree (individual) that consists of economic information. Through evolution process, effective economic information can survive, so GP approaches can not only estimate RV values, but also extract effective information. However, GP approaches need computational efforts to avoid premature convergence. In this paper, we proposed a mutation-base GP approach for RV estimation, and analyze which economic information is needed to estimate RV accurately.</p>   |
| <p>ISMSI2017-122<br/>02:45 p.m. -03:00 p.m.</p> | <div style="text-align: center;">  <p><b>Presenter:</b> S. Manipriya</p> <p><b>From:</b> National Institute of Technology, Tiruchirappalli, Tamil Nadu, India</p> <p><b>Title:</b> Congestion Rate Estimation for VANET Infrastructure using Fuzzy Logic</p> <p><b>Authors:</b> S. Manipriya, C.Mala, Samson Mathew</p> <p><b>Abstract:</b> Rapid Urbanization and higher usage of private transport has led to increase in vehicular traffic in cities across the globe. However, there has been no drastic improvement in terms of the resources to monitor and regulate the vehicular traffic. This leads to frequent congestion in roads and the delay in reaching any destination within the city limits has become inevitable. One of the advancements in wireless technologies to address this issue is Vehicular Ad-hoc Network (VANET) Infrastructure. As one among the service application of VANET, the Congestion Rate (CR) information is essential for travelers to make adaptive decisions and avoid overcrowding. This paper proposes a novel approach to calculate CR in a target geographic area for the smart vehicles of VANET Infrastructure using fuzzy based controllers. In addition, this paper proposes a novel method to reduce the computational complexity owing to the irregularity of traffic and frequent updation of CR value in VANET. Further, simulation models of moderate traffic were created using VISSIM and their corresponding CR values are evaluated using fuzzy logic controller in MATLAB. The results also show that the proposed selective updating algorithm reduces the CR updation by 85% in comparison with conventional periodic updation.</p> </div> |
| <p>ISMSI2017-235<br/>03:00 p.m. -03:15 p.m.</p> | <div style="text-align: center;">  <p><b>Presenter:</b> Lu Yuxin</p> <p><b>From:</b> South China University of Technology, China</p> <p><b>Title:</b> Order Assignment and Routing for Online Food Delivery : Two</p> </div>  |

Meta-Heuristic Methods

**Authors:** Lu Yuxin, Wu Yongzhong and Zhou Yongwu

**Abstract:** Online food delivery business has been generating annual value of billions of dollars owing to the fast development of mobile technology. Tens of thousands of food delivery orders share the resources of hundreds of delivering staff in a single city. How to assign the orders to delivering staff considering cost and service level becomes a vital operational problem for major food delivery platforms competing in the market. In this paper, the higher-level order assignment problem and the lower-level routing problem are solved simultaneously. Two GA based meta-heuristic methods, hierarchical and integrated, are developed for identifying a near-optimal solution for the problem. Computational results show that the hierarchical method performs much better than the integrated one in terms of the objective value. Comparing to the proximity-based assignment method currently used in the industry, the hierarchical method can reduce the total traveling distance by over 11 percent, which implies less delivery cost and higher service level.



**Presenter:** Nicholas Jit Yang Tan

**From:** Nanyang Technological University, Singapore

**Title:** Complex Scenario Planning for Disaster Relief

**Authors:** Meng Hiot Lim, Nicholas Jit Yang Tan, Yew-Kong Leong and Liang-Yong Ho

**Abstract:** Reacting to situational needs for disaster relief measures and deployment of limited resources is a two-pronged operational and procedural protocol. It involves pre-disaster scenario-based planning and subsequently real-time on-the-field execution. In view of the potential complexity in terms of scale and magnitude involved, the pre-disaster stage has taken on a greater significance in an effort to achieve a state of operational readiness. In this article, we outline OptiSmart, a fully integrative planning system that can help fulfill such requirements. The system incorporates state-of-the-art optimization algorithms to carry out planning and scheduling, coupled with effective visualization and simulation tools to facilitate high-level operational support planning. This is applicable to both pre-disaster scenario planning as well as on the ground deployment and execution of real-time disaster management of operational protocol.

ISMSI2017-345  
03:15 p.m. -03:30 p.m.

**Presenter:** Iztok Jr. Fister

**From:** University of Maribor, Slovenia

**Title:** Making up for the deficit in a marathon run

**Authors:** Iztok Jr. Fister, Dušan Fister, Suash Deb, Uroš Mlakar, Janez Brest and Iztok Fister

**Abstract:** To predict the final result of an athlete in a marathon run thoroughly is the eternal desire of each trainer. Usually, the achieved result is weaker than the predicted one due to the objective (e.g., environmental conditions) as well as subjective factors (e.g., athlete's malaise). Therefore, making up for the deficit between predicted and achieved results is the main ingredient of the analysis performed by trainers after the competition. In the analysis, they search for parts of

ISMSI2017-347  
03:30 p.m. -03:45 p.m.

|   |  |
|---|--|
|   | <p>a marathon course where the athlete lost time. This paper proposes an automatic making up for the deficit by using a Differential Evolution algorithm. In a case study, the results that were obtained by a wearable sports-watch by an athlete in a real marathon are analyzed. The first experiments with Differential Evolution show the possibility of using this method in the future.</p>   |
| <p>ISMSI2017-354<br/>03:45 p.m. -04:00 p.m.</p> | <p style="text-align: center;"><b>Presenter:</b> Likewin Thomas<br/><b>From:</b> National Institute of Technology Karnataka, India</p> <p><b>Title:</b> An Online Decision Support System for Recommending an Alternative Path of Execution</p> <p><b>Authors:</b> Likewin Thomas, Manoj Kumar M V and Annappa B</p> <p><b>Abstract:</b> Mobile Ad hoc Networks (MANETs) always bring challenges to the designers in terms of its security deployment due to their dynamic and infrastructure less nature. In the past few years different researchers have proposed different solutions for providing security to MANETs. In most of the cases however, the solution prevents either a particular attack or provides security at the cost of sacrificing the QoS. In this paper we introduce a model that deploys security in MANETs and takes care of the Quality of Services issues to some extent. We have adopted the concept of analyzing the behavior of the node as we believe that if nodes behave properly and in a coordinated fashion, the insecurity level goes drastically down. Our methodology gives the advantage of using this approach.</p> |



### Session Group Photo



### Coffee Break

**03:45 p.m.-04:10 p.m.**

## Session II- Algorithm Design and Optimization



(9 papers, each paper has 13 minutes for presentation, 2 minutes for Q&A)

**Venue: Conference Room IV, First Floor, Regal Oriental Hotel**

**Time: 01:30 p.m.-03:45 p.m.**

**Session Chair: Yukiko Orito**

**\*\*Duration of each presentation is just for reference. We suggest presenters to attend the whole session, just in case the actual presentation time may differ from the scheduled time.**

|  |  |
|--|--|
| <p>ISMSI2017-107<br/>01:30 p.m.-01:45 p.m.</p> |  <p><b>Presenter:</b> Frederick Kin Hing Phoa<br/><b>From:</b> Institute of Statistical Science, Taiwan</p> <p><b>Title:</b> A performance study of parallel programming via CPU and GPU on swarm intelligence based evolutionary algorithm</p> <p><b>Authors:</b> Frederick Kin Hing Phoa and Frank Po-Chen Lin</p> <p><b>Abstract:</b> Algorithm parallelization diversifies a complicated computing task into small parts, and thus it receives wide attention when it is implemented to evolutionary algorithms (EA). This works considers a recently developed EA called the Swarm Intelligence Based (SIB) method as a benchmark to compare the performance of two types of parallel computing approaches: a CPU-based approach via OpenMP and a GPU-based approach via CUDA. The experiments are conducted to solve an optimization problem in the search of supersaturated designs via the SIB method. Unlike conventional suggestions, we show that the CPU-based OpenMP outperforms CUDA at the execution time. At the end of this paper, we provide several potential problems in GPU parallel computing towards EA and suggest to use CPU-based OpenMP for parallel computing of EA.</p> |
| <p>ISMSI2017-115<br/>01:45 p.m.-02:00 p.m.</p> |  <p><b>Presenter:</b> Yukiko Orito<br/><b>From:</b> Hiroshima University, Japan</p> <p><b>Title:</b> A Memetic Algorithm Proposal for Consumption Loan Planning</p> <p><b>Authors:</b> Yukiko Orito, Hiroshi Izawa, Grzegorz Mardyla and Makoto Okamura</p> <p><b>Abstract:</b> We propose a memetic algorithm to optimize a consumption loan planning in this paper. The planning is defined as an optimization problem which maximizes the household's one-year utility function with individual time preferences. Our memetic algorithm consists of an estimation of distribution algorithm for a global search and a heuristic local search for a local search. In the numerical experiments, we show the quasi-optimum solution for the consumption loan planning. From our results, we can analyze the differences between the human behavior's solution in experiment of economics (Izawa and Mardyla, 2011) and the</p>  |

quasi-optimum solution.



**Presenter:** Ruediger Berlich

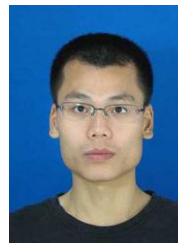
**From:** Gemfony scientific UG (haftungsbeschraenkt), Germany

**Title:** Geneva: Parametric optimization in distributed and parallel environments

**Authors:** Ruediger Berlich, Ariel Garcia and Sven Gabriel

**Abstract:** The Geneva library of parametric optimization algorithms covers execution on parallel devices ranging from GPGPUs and many-core systems over clusters to Grids and Clouds. Four optimization algorithms, including particle swarms and evolutionary algorithms have been implemented, and best solutions from one algorithm may be transferred to another. Parallelization is mostly transparent to the user, leaving little work for him to be done for execution on a wide range of devices, once his optimization problems have been defined. The entire library is available as Open Source, and targets particularly problems with very long running, computationally expensive optimization problems, often involving simulations. The definition of optimization problems may involve constraints between multiple parameters. Geneva was originally developed for and used in science, particularly particle physics (hence the name), but is today also used commercially. The presentation covers the architecture of Geneva and introduces use-cases.

ISMSI2017-120A  
02:00 p.m.-02:15 p.m.



**Presenter:** Wenbo Zhang

**From:** University of Electronic Science and Technology of China, China

**Title:** Estimation Algorithm of Atmospheric Light based on Ant Colony Optimization



**Authors:** Wenbo Zhang and Xiaorong Hou

**Abstract:** In the algorithm of haze removal based on atmospheric scattering model, atmospheric light value is an important parameter and its accuracy directly influences the quality of result of haze removal. Existing methods adopt a fixed number of candidate points of atmospheric light to make clustering and statistic estimation of atmospheric light is made with maximum point cluster including candidate points. However, due to less samples of candidate points, there is a great error of estimation of atmospheric light in a statistical sense. In order to solve that problem, this essay adopts the mode of dividing threshold value to select candidate points of atmospheric light and Ant Colony Optimization to cluster point-cluster of atmospheric light, by which number of samples of candidate points of atmospheric light and accuracy of result of estimation of atmospheric light are increased. In addition, in order to improve computational efficiency of algorithm, this essay first uses K-means algorithm to make preliminary aggregation of candidate points of atmospheric light and then utilizes Ant Colony Optimization to improve result of

ISMSI2017-349  
02:15p.m.-02:30p.m.

|  |  |
|--|--|
|  | <p>clustering. The experimental result proves that atmospheric light obtained by using that method enables result of haze removal to be more natural and further improve index of image quality evaluation of result of haze removal.</p>  |
| <p>ISMSI2017-352<br/>02:30 p.m.-02:45 p.m.</p> | <p style="text-align: center;"><b>Presenter:</b> Debasis Maharana<br/><b>From:</b> Indian Institute of Technology Guwahati, India</p> <p style="text-align: center;"><b>Title:</b> Optimization of Bio-refineries using Genetic Algorithm</p> <p><b>Authors:</b> Debasis Maharana, Priya Choudhary and Prakash Kotecha</p> <p><b>Abstract:</b> An optimal production of biofuels from biomass is necessary in order to ensure its competitiveness. In this article, we consider the efficient production and procurement of biofuel to satisfy the demands of multiple users considering a multitude of factors such as the availability of multiple technologies, procurement of biomass from a variety of sources, optimal location for the production of biofuels along with various costs involved with respect to transportation, bio-feedstock and investment. This combinatorial problem is efficiently modelled so as to enable the use of computational intelligence based optimization techniques. The proposed strategy is successfully demonstrated with the help of Genetic Algorithm on a case study involving 3 feedstock sources, 2 central processing facilities, 4 industrial facilities with 8 users and 10 technologies.</p> |
| <p>ISMSI2017-356<br/>02:45 p.m.-03:00 p.m.</p> | <p style="text-align: center;"><b>Presenter:</b> Jagadeesh Dondeti<br/><b>From:</b> Indian Institute of Technology Guwahati, India</p> <p style="text-align: center;"><b>Title:</b> Benchmarking JAYA and Sine Cosine Algorithm on Real Parameter Bound Constrained Single Objective Optimization Problems</p> <p><b>Authors:</b> Remya Kommadath, Jagadeesh Dondeti and Prakash Kotecha</p> <p><b>Abstract:</b> A large number of computational intelligence algorithms are proposed every year and their performance is usually demonstrated on a cross-section of problems which may not provide an ideal comparative analysis. Hence it becomes important to independently evaluate the performance of such algorithms on complex optimization problems. In this work, we have used the benchmark suite of IEEE CEC2014 which has been extensively used in literature to study the performance of two recently proposed algorithms, viz., JAYA and Sine Cosine Algorithm. The performance is analyzed based on 9180 instances (30 functions X 3 dimensions X 51 runs X 2 algorithms) comprising of unimodal, multimodal, hybrid and composite benchmark functions involving up to 50 real variables.</p>                                     |
| <p>ISMSI2017-357<br/>03:00 p.m.-03:15 p.m.</p> | <p style="text-align: center;"><b>Presenter:</b> Anant Kumar<br/><b>From:</b> Indian Institute of Technology Guwahati, India</p> <p style="text-align: center;"><b>Title:</b> Optimal Pollution trading using fireworks and genetic algorithm</p> <p><b>Authors:</b> Anant Kumar and Prakash Kotecha</p> <p><b>Abstract:</b> The concept of pollution trading enables industries to trade pollutant credits and hence provides the flexibility to regulatorily reduce emissions below their threshold level. In this work, we propose a strategy to solve this combinatorial optimization problem using computational intelligence techniques that are readily available. One of the major benefits of the proposed strategy is that it does not employ artificial binary decision variables and hence the size of the problem does not scale exponentially for larger case studies. The proposed strategy has been demonstrated using fireworks and genetic algorithm on three different cases of a</p>   |



|  |   |
|--|---|
|  | <p>pollution trading problem from the literature. The performances of both the algorithms are analyzed using 60 (2 algorithms x 10 runs x 3 cases) unique instances.</p>  |
| <p>ISMSI2017-358<br/>03:15 p.m.-03:30 p.m.</p> | <div style="text-align: center;">  <p><b>Presenter:</b> Renico Koen<br/><b>From:</b> University of Pretoria, South Africa</p> <p><b>Title:</b> Maze exploration using a fungal search algorithm: Part 1 - Algorithm model</p> <p><b>Authors:</b> Renico Koen and Andries Engelbrecht</p> <p><b>Abstract:</b> This paper proposes a new maze exploration algorithm based on a fungal search algorithm (FSA). The proposed maze exploration fungal search algorithm (MEFSA) was tested using randomly generated 100 cell mazes. Results indicate that the MEFSA can successfully be applied to solve mazes. The contribution made in this paper is the application of the FSA to the problem of maze exploration.</p> </div>  |
| <p>ISMSI2017-359<br/>03:30 p.m.-03:45 p.m.</p> | <div style="text-align: center;">  <p><b>Presenter:</b> Renico Koen<br/><b>From:</b> University of Pretoria, South Africa</p> <p><b>Title:</b> Maze exploration using a fungal search algorithm: Part 2 – Empirical analysis</p> <p><b>Authors:</b> Renico Koen and Andries Engelbrecht</p> <p><b>Abstract:</b> This paper studies the effect of the number of initial artificial spores (ASs) on search exploration coverage of a fungal search algorithm (FSA). A maze exploration fungal search algorithm (MEFSA) was defined previously. The MEFSA is tested in this paper using randomly generated mazes of 100, 200 and 300 cells using varying numbers of initial ASs. Results indicate that the exploration ability and predictability of the MEFSA are dramatically improved as more initial ASs are added. The contribution made in this paper is the study of the impact of the number of initial artificial spores (ASs) on FSA exploration coverage.</p> </div> |



## Session Group Photo



**Coffee Break**

**03:45 p.m.-04:10 p.m.**

**(B1, Regal Oriental Hotel)**

### Session III: Machine Learning


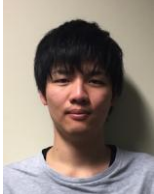
(6 papers, each paper has 13 minutes for presentation, 2 minutes for Q&A)



**Venue: Conference Room I-III, First Floor, Regal Oriental Hotel**

**Time: 04:10 p.m.-05:40 p.m.**

**Session Chair: Toshiaki Omori**

**\*\*Duration of each presentation is just for reference. We suggest presenters to attend the whole session, just in case the actual presentation time may differ from the scheduled time.**

|  |   |
|--|---|
| <p>ISMSI2017-118<br/>04:10 p.m.-04:25 p.m.</p> | <p><b>Presenter: Punitha V</b><br/><b>From: National Institute of Technology, Tiruchirappalli, India</b><br/><b>Title: Traffic Classification for the Dispatcher in a Server Farm based on SVM</b><br/><b>Authors: Punitha V and Mala C</b><br/><b>Abstract:</b> The increased capacity of Internet connections leads to more and wider usage of Internet services. So an effective task-server assignment policy is obligatory to improve the performance of the Server farms. Scalable techniques that categories the traffic always assist to enhance the performance. Existing dispatcher of the Server farm do not consider a timely classification approach for the improvement of QoS. So this paper proposes a classifier for the dispatcher which classifies the requests using dynamic properties of the Server farm. The proposed machine learning classification method based on SVM aims to minimize the makespan and to improve the execution fairness. The classification is performed using LibSVM. The performance in terms of classification precision and waiting time are measured and the simulated results have shown considerable performance improvement.</p> |
| <p>ISMSI2017-231<br/>04:25 p.m.-04:40 p.m.</p> | <p><br/><b>Presenter: Junyi Chen</b><br/><b>From: City University of Hong Kong, Hong Kong</b><br/><b>Title: Aggressivity Detection on Social Network Comments</b><br/><b>Authors: Junyi Chen, Shankai Yan and Ka-Chun Wong</b><br/><b>Abstract:</b> Verbal aggression and cyberbullying are widely concerned issues in netiquette. In this article, we introduce a text mining system that can detect whether a certain paragraph contains the aggressive sentiment, and demonstrate its performance with different classification models. In addition, it is observed that our system works well on both our manually curated dataset and the de facto dataset. Extensive experiments are conducted to validate the effectiveness of the proposed system and highlight some possible factors that contribute to the robust results.</p>  |
| <p>ISMSI2017-237<br/>04:40 p.m.-04:55 p.m.</p> | <p><br/><b>Presenter: Seiya Yabuuchi</b></p>  |

|  |   |
|--|---|
|  | <p style="text-align: center;"><b>From:</b> Kobe University, Japan</p> <p style="text-align: center;"><b>Title:</b> Nonparametric Estimation for Membrane Resistances Distributed Non-Uniformly in Neurons</p> <p><b>Authors:</b> Seiya Yabuuchi and Toshiaki Omori</p> <p><b>Abstract:</b> In this study, we propose a machine learning algorithm for estimating a multi-compartment model of neurons. In computational neuroscience, simulations of neurons are performed to understand functions of neurons and brain systems. To construct realistic models that mimic biological neurons, it is necessary to estimate circuit constants of neurons which are non-uniformly distributed over a neuron. However, it is difficult to measure all the parameters that characterize the neurons. In this paper, we propose a method using a Markov Chain Monte Carlo algorithm to estimate the spatial distribution of circuit constants from noisy membrane potential observations with a nonparametric approach. Total variation prior distribution and gaussian process proposal distribution are employed in order to overcome the difficulty in estimation. We show that our proposed method provides reasonable estimation of the non-uniform distribution of circuit constants.</p>  |
| <p>ISMSI2017-240<br/>04:55 p.m.-05:10 p.m.</p> | <div style="text-align: center;">  <p><b>Presenter:</b> Naveen Kumar Gondhi<br/><b>From:</b> Shri Mata Vaishno Devi University, India</p> <p><b>Title:</b> Survey of Machine learning based scheduling in Cloud Computing</p> <p><b>Authors:</b> Naveen Kumar Gondhi and Ayushi Gupta</p> <p><b>Abstract:</b> In the modern era, cloud computing gains a lot of attention due to its various features such as it is simple to use, minimum cost, and mostly low power consumption. Many algorithms and techniques have been proposed for scheduling of virtual machines to provide dynamic load balancing, dynamic scalability and reallocation of resources. Intelligent algorithms are used for the optimization of results and minimizing the makespan scheduling while utilizing the resources efficiently based on dynamic environment. This paper reviews various intelligent scheduling algorithms such as Genetic Algorithm (GA), Simulated annealing (SA), Tabu Search (TS), Ant Colony Optimization (ACO), Particle Swarm Optimization (PSO), Artificial Immune System (AIS), Bacterial Foraging Algorithm (BF), Fish Swarm Optimization Algorithm (FS), Cat Swarm Optimization Algorithm (CS), Firefly Algorithm (FF), Cuckoo Search Algorithm (CS), Artificial Bee Colony (ABC), Bat Algorithm (BA).</p> </div> |
| <p>ISMSI2017-241<br/>05:10 p.m.-05:25 p.m.</p> | <div style="text-align: center;">  <p><b>Presenter:</b> Rajat Chugh, Rishab Girdhar and Simran Aggarwal<br/><b>From:</b> Delhi Technological University, India</p> <p><b>Title:</b> Classification Of Faults in Web Application Using Machine Learning</p> <p><b>Authors:</b> Akshi Kumar, Rajat Chugh, Rishab Girdhar and Simran Aggarwal</p> <p><b>Abstract:</b> Web is huge, abundant and heterogeneous and so are the challenges that arise due to this versatility. Web Applications as the new task-centric and action-oriented facilities have assumed a distinguished role in today's Web. At the</p> </div>  |

same time, faults in these Web Applications are tedious and hard to test due to the labor and resource intensive nature of testing. Thus, making it essential to use automated strategies like fault based testing that can test the continuously advancing web. Fault based testing uses fault classification as a baseline to make testing cost-effective and efficient, hence making fault classification necessary. Fault classification in Web Applications is a course of action of developing models to segregate the various kinds of faults for real world fault based testing. Manual classification tends to be strenuous and therefore in this paper, we intend to predict an efficient automated model which will classify the faults. Our model uses Text Mining and Machine Learning technique to classify the faults of three open source Web Applications, namely, the qaManager, bitWeaver and WebCalender. We provide a comparative study among four models in which different Machine Learning techniques are used such as Support Vector Machines (SVM), Decision Tree, Bernoulli Naïve Bayes and Multinomial Naïve Bayes. To analyze the performance of these models, Area Under the Curve (AUC) obtained from Receiver Operating Characteristics (ROC) and 10-fold validation is used. Results show that all considered Machine Learning techniques prove to be efficient in the classification of faults. Apart from this, analysis also shows that the performance of Multinomial Naïve Bayes Classifier is better than the other three classifiers.



**Presenter:** Hiroaki Inoue  
**From:** Kobe University, Japan

**Title:** Bayesian Estimation of Neural Systems using Particle-Gibbs

**Authors:** Hiroaki Inoue, Toshiaki Omori

**Abstract:** We propose a statistical machine learning method for estimating the distributions of parameters in a neural system with multiple neurons. Extracting neural systems from observable imaging data is an important subject in machine learning, medical engineering and computational neuroscience. In this study, we formulate the generalized state-space model based on the generative process of the observable data provided by calcium imaging. In the proposed method, we employ particle Gibbs algorithm in order to realize simultaneous estimation of the distributions of the latent variables representing the state of neurons and those of parameters of neuron units and network connectivity. We show that our proposed method successfully estimates not only parameters of individual neurons and but also those of network structure, simultaneously.

ISMSI2017-350  
 05:25 p.m.-05:40 p.m.



## Session Group Photo



**Dinner Time: 06:30 p.m.-08:00 p.m.**

**Venue: CaféNeo**

**(B1, Regal Oriental Hotel)**

## Session IV: Mechanical Manufacturing and Control Engineering



(7 papers, each paper has 13 minutes for presentation, 2 minutes for Q&A)

**Venue: Conference Room IV, First Floor, Regal Oriental Hotel**

**Time: 04:10 p.m.-05:55 p.m.**

**Session Chair: Thomas Hanne**

**\*\*Duration of each presentation is just for reference. We suggest presenters to attend the whole session, just in case the actual presentation time may differ from the scheduled time.**

|   |  |
|---|--|
| <p>ISMSI2017-229A<br/>04:10 p.m.-04:25 p.m.</p> |  <p><b>Presenter:</b> Anusuiya Pratap Singh<br/><b>From:</b> AKS University, Satna (M.P.)-485001, India</p> <p><b>Title:</b> Modeling and Optimization of Hybrid Metal Matrix Composite using Combined ANN &amp; PSO approach</p> <p><b>Authors:</b> Ankit Singh, Anusuiya Pratap Singh and Pankaj Kumar Shrivastava</p> <p><b>Abstract:</b> The modern age demands advanced materials to meet new challenges as the technology is continually becoming more advanced rapidly. To process these advanced materials we need efficient technology and to understand the process behavior, advance computing techniques are required. Copper-Iron-Graphite is a new hybrid metal matrix composite gaining popularity in many industrial applications. But the machining of this composite is challenging due to it's superior mechanical properties.</p> <p>In the present work electrical discharge machining based hybrid machining process has been used for the machining of Copper-Iron-Graphite metal matrix composite by varying different process parameters. Artificial neural network and particle swarm optimization are widely accepted modeling and optimization techniques in present manufacturing paradigm. The artificial neural network has been used to develop predictive models for different quality characteristics. Further, optimization has been done by using particle swarm optimization.</p> |
| <p>ISMSI2017-230<br/>04:25 p.m.-04:40 p.m.</p>  |  <p><b>Presenter:</b> Zehai Ren<br/><b>From:</b> Lanzhou University of Technology, China</p> <p><b>Title:</b> Opportunistic Maintenance Modeling for Serial-Parallel System Considering Bottleneck Constraint</p> <p><b>Authors:</b> Youtang Li, Zehai Ren and Yue Cheng</p> <p><b>Abstract:</b> Considering the equipment due to the performance degradation affects the production ability for Serial-Parallel System, it will make production bottlenecks that cause the waste of production capacity and maintenance costs, this paper put the reliability as index of production capacity and the bottleneck process as constraint. The dynamic opportunistic preventive maintenance model is constructed, the preventive maintenance threshold and opportunistic preventive maintenance</p>  |

threshold as the decision variables, which aims to consider from the costs. Finally, by the means of a numerical example, find the optimal threshold value combinations by using the Monte Carlo simulation method, the model is proved to be reasonable and effective, and a new approach is proposed for opportunistic preventive maintenance strategy.



**Presenter:** Rika Rokhana

**From:** Institut Teknologi Sepuluh Nopember, Indonesia

**Title:** Estimation Of Wire Phantom's Position in Ultrasound Probe Calibration Base on Polynomial Equation

**Authors:** Rika Rokhana, Eko M. Yuniarno, Ketut E. Purnama and Mauridhi H. Purnomo

**Abstract:** This paper presents a method of estimating wire phantom's position in the ultrasound probe calibration system. The accurated phantom position is very important in the process of calibrating ultrasound probe. In this research, we used a wire phantom to calibrate ultrasound probe. In the scanning process, probe have some positions and orientations to wire phantom, according to position and orientation probe to wire phantom. Thus, it produced some types of images of the same phantom.

In a system calibration, phantom reflects ultrasound echoes stronger than other media around. Phantom will generate maximum intensity in the B mode ultrasound images. Maximum intensity often causes saturation images and usually includes some saturated pixels area, so it must be done a certain method to determine the exact position of the phantom.

To find the position of phantom in the B mode images, it has to model the distribution of data images. Data distribution in the ultrasound image was approximated using 5st degree polynomial equation. Curve of ultrasound image fit to the polynomial's curva to compute the maximum value of this image. Using polynomial fitting to estimate position of phantom, root mean square error between program counting and manually counting is 0.1453 pixels in row and 0.1211 pixels in column.

ISMSI2017-239  
04:40 p.m.-04:55 p.m.



**Presenter:** Thanadat Kerdsiri

**From:** King Mongkut's Institute of Technology Ladkrabang, Thailand

**Title:** Early Fault Detection based on Ball Bearing Vibration Analysis using Multinomial Logistic Regression

**Authors:** Thanadat Kerdsiri and Rutchanee Gullayanon

**Abstract:** Rotating machines plays an importance role in several applications such as transportation, industrial and military. Maintaining continuous operations of these machines are vital to these applications. The reliability of these rotating machines depends on ball bearing health. Bearing can fail from many factors, e.g., impurity of lubricant, improper installation, etc. All of these defects can be detected by vibration

ISMSI2017-361  
04:55 p.m.-05:10 p.m.



analysis. Therefore, vibration signals are utilized to develop early fault detection of ball bearing to warn operators of any anomalies in the system. This paper presents a fault detection algorithm using logistic regression method to assess health state of the system. This regression utilizes the node energy of wavelet packet decomposition, kurtosis and crest factor as key features. The resulting signals are processed by Savitzky-Golay smoothing algorithm before determining the time location where the defects occur with a confidence interval of 99%. The proposed method was tested with actual vibration data of bearing which provide by FEMTO-ST institute and showed that it is capable of accurately predicting defect time only 10 seconds after the actual defect occurred. The worst-case prediction of 970 seconds after defect occurs also observed during experiment. Although the system did not set off alarm for fault detection after 970 seconds, one can observe increase in the fault probability trends in early state. Therefore, the proposed algorithm can be utilized for early fault detection in ball bearing application.

ISMSI2017-355  
05:10 p.m.-05:25 p.m.

**Presenter:** Manoj Kumar M V  
**From:** National Institute of Technology Karnataka, India  
**Title:** Distilling Lasagna from Spaghetti Processes

**Authors:** Manoj Kumar M V, Likewin Thomas , Annappa B

**Abstract:** If the operational process is flexible, control flow discovery methods in process mining tend to produce Spaghetti (unstructured) models. Spaghetti models generally consist of large number of activities and paths. These models are unstructured, incomprehensible, difficult to analyse, impossible to use during operational support and enhancement. Due The structural complexity of Spaghetti processes majority of techniques in process mining can not be applied on them. There is a at most necessity to design and develop methods for simplifying the structure of Spaghetti process to make them easily understandable and reusable. The methods proposed in this paper concentrates on o  
ering the tools and techniques for analysing the Spaghetti process. The problems addressed in this paper are 1) converting the unstructured Spaghetti to structured and simplified Lasagna process, 2) identifying the list of possible, significant, and impossible paths of execution in Lasagna process. The proposed technique is veried and validated on real-life road traffic ne management event log taken from standard repository.

ISMSI2017-123  
05:25 p.m.-05:40 p.m.



**Presenter:** Thomas Hanne  
**From:** University of Applied Sciences and Arts Northwestern Switzerland  
**Title:** Emotion Influenced Robotic Path Planning

**Authors:** M. Sidler, C. Rudolf Von Rohr, R. Dornberger and T. Hanne

**Abstract:** We introduce an emotion influenced robotic path planning solution, which offers the possibility of enabling emotions into the robot. The robot can change the speed of the path or learn where it should be and where it should not be. Most existing solutions for robotic path planning have no emotional influences. The most successful emotions were taken and included into the solution of this paper. The results were analyzed with regards to the time and speed it takes for a normal robotic path planning without emotions and with emotions of happiness, fear and

novelty.



**Presenter:** En-Chih Chang  
**From:** I-Shou University, Taiwan

**Title:** Application of Non-singular Finite-Time Convergent Sliding Mode Control Based on Fuzzy Probabilistic Neural Network for Renewable Energy Systems

**Authors:** En-Chih Chang

**Abstract:** Modern high performance renewable energy systems utilize feedback techniques with sophisticated control algorithms, but such complicated algorithms cause heavy computational requests. With application to renewable energy systems, a mathematically easy and algorithmically speedy non-singular finite-time convergent sliding mode control (NFTCSMC) based on fuzzy probabilistic neural network (FPNN) is proposed in this paper. The NFTCSMC creates finite system-state convergence time and is without singularity problem. But, when the system uncertainty bounds are overestimated or underestimated, chatter or steady-state error problems still exist in NFTCSMC. A FPNN with quick calculation and suitable for digital implementation, is thus used to overcome chattering and steady-state error problems. The proposed methodology improves classic finite-Time convergent sliding mode control loop with the goals of lessened control algorithm complicacy and enhanced computational speed. Experimental results from the one kilowatt prototype are shown to confirm the mathematic analyses. Because the proposed renewable energy system yields remarkable benefits over classic finite-time convergent sliding mode renewable energy system in terms of calculational simplicity and implemented easiness, this paper will be an applicable reference to related artificial intelligence designers.

ISMSI2017-242  
05:40 p.m.-05:55 p.m.



**Session Group Photo**



**Dinner Time: 06:30 p.m.-08:00 p.m.**

**Venue: Caf éNeo**

## Poster Session (2 Papers)

Venue: Conference Room I-III, First Floor, Regal Oriental Hotel

Time: 09:00 a.m.-06:00 p.m., March 26, 2017

|               |  |
|---------------|--|
| ISMSI2017-105 | <p><b>Title:</b> Method of Task Assignment for UAV Based on Particle Swarm Optimization in logistics</p> <p><b>Authors:</b> Xiaowei Jiang, Qiang Zhou, Ying Ye</p> <p><b>Abstract:</b> In recent years, there are many research achievements in the fields of logistics and Unmanned Aerial Vehicle (UAV). But the research achievement of the combination of the two fields is few. Researching on the combination of the UAV filed and the logistics filed has theoretical significance. Effective logistics system and task assignment strategy play an important role in reducing the operation cost of logistics enterprise as well as improving transport efficiency. In this paper, according to the Vehicle Routing Problems with Time Windows (VRPTW), we establish the model of task assignment for UAV in logistics. This model takes multi-constraints (such as weight coefficients, time-windows constraints, the constraints of the UAV and so on ) into account. And then the task assignment problem with multiple constraints is solved by improved Particle Swarm Optimization (PSO) algorithm which is suitable for solving complex combinatorial optimization problems. Meanwhile, we make some modification for the PSO to suit for the acquirement of mutually exclusive. Finally, the basic principle and simulation steps of the improved PSO algorithm is discribed in detail. And a practical example is given to the simulation. The simulation results show that this algorithm is efficient to solve the problem of task assgiment for UAV.</p> |
| ISMSI2017-348 | <p><b>Title:</b> Optimization of Locators Placement for Minimum Workpiece Positioning Error</p> <p><b>Authors:</b> Mamoona Arshad</p> <p><b>Abstract:</b> Product quality greatly depends upon the fixture quality. Proper fixture design plays a critical role in attaining the required quality of the product. Among many other factors, locator's placement is one of the significant factors in fixture design. In this article, locator's placement of 3-2-1 fixture configuration system is optimized by using genetic algorithm to reduce part positioning error. Analytical method is used to calculate the displacement of workpiece placed on the locators. Langrangian formulation is used to calculate the rigid body displacement and locator deformation by considering small displacements. The result reduced the positioning error of the workpiece by optimization of the placement of loactors.</p>  |

# Author Index

| paper ID          | Presenter               | Session | page |
|-------------------|-------------------------|---------|------|
| ISMSI2017-106     | Ajay Koul               | 1       | 18   |
| ISMSI2017-357     | Anant Kumar             | 2       | 24   |
| ISMSI2017-229A    | Ansuya Pratap Singh     | 4       | 31   |
| ISMSI2017-352     | Debasis Maharana        | 2       | 24   |
| ISMSI2017-242     | En-Chih Chang           | 4       | 34   |
| ISMSI2017-108     | Erion Çano              | 1       | 18   |
| ISMSI2017-107     | Frederick Kin Hing Phoa | 2       | 22   |
| ISMSI2017-350     | Hiroaki Inoue           | 3       | 29   |
| ISMSI2017-113     | Hiroki Nakajima         | 1       | 17   |
| ISMSI2017-347     | Iztok Jr. Fister        | 1       | 20   |
| ISMSI2017-356     | Jagadeesh Dondeti       | 2       | 24   |
| ISMSI2017-231     | Junyi Chen              | 3       | 27   |
| ISMSI2017-112     | Keiko Ono               | 1       | 18   |
| ISMSI2017-354     | Likewin Thomas          | 1       | 21   |
| ISMSI2017-235     | Lu Yuxin                | 1       | 19   |
| ISMSI2017-355     | Manoj Kumar M V         | 4       | 33   |
| ISMSI2017-240     | Naveen Kumar Gondhi     | 3       | 28   |
| ISMSI2017-345     | Nicholas Jit Yang Tan   | 1       | 20   |
| ISMSI2017-118     | Punitha V               | 3       | 27   |
| ISMSI2017-241     | Rajat Chugh             | 3       | 28   |
| ISMSI2017-358&359 | Renico Koen             | 2       | 25   |
| ISMSI2017-239     | Rika Rokhana            | 4       | 32   |
| ISMSI2017-241     | Rishab Girdhar          | 3       | 28   |
| ISMSI2017-120A    | Ruediger Berlich        | 2       | 23   |
| ISMSI2017-122     | S. Manipriya            | 1       | 19   |
| ISMSI2017-237     | Seiya Yabuuchi          | 3       | 27   |
| ISMSI2017-241     | Simran Aggarwal         | 3       | 28   |
| ISMSI2017-234A    | Soyeong Jeong           | 1       | 17   |
| ISMSI2017-361     | Thanadat Kerdsiri       | 4       | 32   |
| ISMSI2017-123     | Thomas Hanne            | 4       | 33   |
| ISMSI2017-349     | Wenbo Zhang             | 2       | 23   |
| ISMSI2017-115     | Yukiko Orito            | 2       | 22   |
| ISMSI2017-230     | Zehai Ren               | 4       | 31   |



