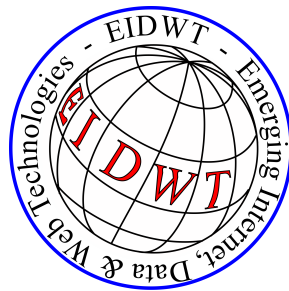


# PROGRAM GUIDE

## EIDWT-2022

The 10-th International Conference on  
Emerging Internet, Data & Web Technologies



Technically Supported by:



Fukuoka Institute of Technology

Virtual Conference (Online Presentation)

March 2-4, 2022

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## **EIDWT-2022 Organizing Committee**

### **Honorary Chair**

Makoto Takizawa, Hosei University, Japan

### **General Co-Chairs**

Kengo Katayama, Okayama Univ. of Science, Japan

Juggapong Natwichai, Chiang Mai University, Thailand

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Elis Kulla, Okayama University of Science, Japan

Omar Hussain, Univ. of New South Wales, Australia

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Santi Caballé, Open University of Catalonia, Spain

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Tetsuya Oda, Okayama University of Science, Japan

Masaharu Hirota, Okayama University of Science, Japan

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Kevin Bylykbashi, Fukuoka Institute of Technology, Japan

Ermioni Qafzezi, Fukuoka Institute of Technology, Japan

Phudit Ampirit, Fukuoka Institute of Technology, Japan

### **Finance Chair**

Makoto Ikeda, Fukuoka Institute of Technology, Japan

### **Steering Committee Chair**

Leonard Barolli, Fukuoka Institute of Technology, Japan

## **Welcome Message of EIDWT International Conference Organizers**

Welcome to the 10-th International Conference on Emerging Internet, Data and Web Technologies (EIDWT-2022), which will be held from March 2 to March 4, 2022 at Okayama University of Science, Okayama, Japan.

The EIDWT is dedicated to the dissemination of original contributions that are related to the theories, practices and concepts of emerging Internet and data technologies yet most importantly of their applicability in business and academia towards a collective intelligence approach.

In EIDWT-2022 will be discussed topics related to Information Networking, Data Centres, Data Grids, Clouds, Crowds, Mashups, Social Networks, Security Issues and other Web 2.0 implementations towards a collaborative and collective intelligence approach leading to advancements of virtual organizations and their user communities. This is because, current and future Web and Web 2.0 implementations will store and continuously produce a vast amount of data, which if combined and analyzed through a collective intelligence manner will make a difference in the organizational settings and their user communities. Thus, the scope of EIDWT-2022 includes methods and practices which bring various emerging Internet and data technologies together to capture, integrate, analyze, mine, annotate and visualize data in a meaningful and collaborative manner. Finally, EIDWT-2022 aims to provide a forum for original discussion and prompt future directions in the area.

An international conference requires the support and help of many people. A lot of people have helped and worked hard for a successful EIDWT-2022 technical program and conference proceedings. First, we would like to thank all authors for submitting their papers. We are indebted to Program Area chairs, Program Committee members and reviewers who carried out the most difficult work of carefully evaluating the submitted papers. We would like to give our special thanks to Honorary Chair of EIDWT-2022 Prof. Makoto Takizawa, Hosei University, Japan for his guidance and support. We would like to express our appreciation to our keynote speakers for accepting our invitation and delivering very interesting keynotes at the conference.

### **EIDWT-2022 International Conference Organizers**

#### **EIDWT-2022 Steering Committee Chair**

Leonard Barolli, Fukuoka Institute of Technology (FIT), Japan

#### **EIDWT-2022 General Co-Chairs**

Kengo Katayama, Okayama Univ. of Science, Japan

Juggapong Natwichai, Chiang Mai University, Thailand

#### **EIDWT-2022 Program Committee Co-Chairs**

Elis Kulla, Okayama University of Science, Japan

Omar Hussain, Univ. of New South Wales, Australia

**EIDWT 2022 Keynote Talk I**

**Prof. Alex Thomo, University of Victoria, British Columbia, Canada**

**Title: Mining of Cohesive Groups in Massive Social and Web Graphs**

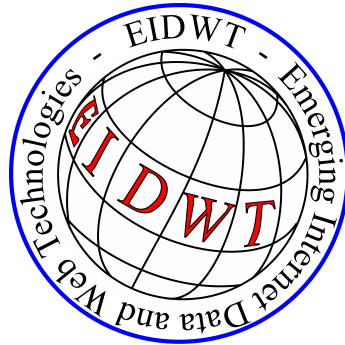
**Abstract:** Mining dense subgraphs and discovering hierarchical relations between them is a fundamental problem in graph analysis tasks. For instance, it can be used in visualizing complex networks, finding correlated genes and motifs in biological networks, detecting communities in social and web graphs, summarizing text, and revealing new research subjects in citation networks. Core, truss, and nucleus decompositions are popular tools for finding dense subgraphs. A  $k$ -core is a maximal subgraph in which each vertex has at least  $k$ -neighbors, and a  $k$ -truss is a maximal subgraph whose edges are contained in at least  $k$ -triangles. Core and truss decompositions have been extensively studied in both deterministic as well as probabilistic graphs. A more recent notion of dense subgraphs is nucleus decomposition which is a generalization of core and truss decompositions that uses higher-order structures to detect dense regions in the graph. In this talk, I will first motivate and illustrate core, truss, and nucleus decompositions for mining dense hierarchical regions in large graphs. Next, I will describe algorithms for computing these decompositions and outline avenues for further research.

**EIDWT 2022 Keynote Talk II**

**Prof. Lidia Dominika Ogiela, AGH University of Science and Technology, Krakow, Poland**

**Title: Human centered approaches in transformative computing applications**

**Abstract:** Human centered systems are now recognized as one of the most important solutions in artificial intelligence. Their advantage over other results from the fact that they still adapt their operation to changing and unpredictable tasks and functions. The variability of the human analysis process, which is the basis for the operation of such systems, means that the developed IT solutions are constantly evolving, and their development is a determinant of various external factors – independent of humans and those that depend on them. Human centered systems allow for the implementation of tasks of deep, meaningful analysis and interpretation of various data sets. Their special advantage is the possibility of incorporating features characteristic of the human perception processes of automatic data prediction. In human centered systems, transformative computing processes are also carried out, giving the possibility of implementing analysis steps at various levels of inference. The differentiation of the levels, at which the interpretation and inference processes are carried out is characteristic of complex data management structures.



# EIDWT-2022

## Main Conference Program

**Wednesday, March 2, 2022**

### **EIDWT-2022 Keynote I**

**13:00-14:00 (Japan time zone: UTC+9)**

**06:00-07:00 (Europe time zone:UTC+2)**

### **EIDWT-2022 Keynote Talk I**

**Prof. Alex Thomo:** Mining of Cohesive Groups in Massive Social and Web Graphs

### **Parallel Sessions**

**15:30-17:00 (Japan time zone: UTC+9)**

**08:30-10:00 (Europe time zone:UTC+2)**

### **EIDWT-S1: Wireless and Mobile Networking**

**Chair: Elis Kulla, Okayama University of Science, Japan**

1. A Comparison Study of RIWM with RDVM and CM Router Replacement Methods for WMNs Considering Boulevard Distribution of Mesh Clients  
*Admir Barolli, Phudit Ampririt, Shinji Sakamoto, Elis Kulla and Leonard Barolli*
2. Mobility-Aware Narrow Routing Protocol for Underwater Wireless Sensor Networks  
*Elis Kulla, Kuya Shintani and Keita Matsuo*
3. Design and Implementation of a Testbed for Delay Tolerant Networks: Work in Progress  
*Kuya Shintani, Elis Kulla, Makoto Ikeda, Leonard Barolli, and Evjola Spaho*

4. Evaluation of Focused Beam Routing Protocol on Delay Tolerant Network for Underwater Optical Wireless Communication  
*Keita Matsuo, Elis Kulla and Leonard Barolli*
5. Social Experiment of Realtime Road State Sensing and Analysis for Autonomous EV Driving in Snow Country  
*Yositaka Shibata, Akira Sakuraba, Yoshikazu Arai, Yoshiya Saito and Noriki Uchida*
6. A Fuzzy-based System for Slice Service Level Agreement in 5G Wireless Networks: Effect of Traffic Load Parameter  
*Phudit Ampririt, Ermioni Qafzezi, Kevin Bylykbashi, Makoto Ikeda, Keita Matsuo, Leonard Barolli*

### **EIDWT-S2: Data Management and Visualization**

**Chair: Juggapong Natwichai, Chiang Mai University, Thailand**

1. Service Platform for Social and Community to Drive the Royal Project Foundation  
*Suphatchaya Autarrom, Kittayaporn Chantaranimi, Anchan Chompupoung, Pichan Jinapook, Waranya Mahanan, Pathathai NaLumpoon, Juggapong Natwichai, Prompong Sugunsil, Sumalee Sangamuang, Titipat Sukhvibul, Pree Thiengburanathum*
2. Implementation of a Local-community Issues Visualization System using Open Data and Future Population Projection  
*Tomoyuki Ishida and Mutsuki Kojima*
3. Identifying Vehicle Exterior Color by Image Processing and Deep Learning  
*Somayeh Abniki, Kin Fun Li, Tom Avant*
4. Practical Survey on MapReduce Subgraph Enumeration Algorithms  
*Xiaozhou Liu, Yudi Santoso, Venkatesh Srinivasan, Alex Thomo*
5. A River Monitoring and Predicting System Considering a Wireless Sensor Fusion Network and LSTM  
*Yuki Nagai, Tetsuya Oda, Tomoya Yasunaga, Chihiro Yukawa, Aoto Hirata, Nobuki Saito, Leonard Barolli*

### **Parallel Sessions**

**17:30-19:00 (Japan time zone: UTC+9)**

**10:30-12:00 (Europe time zone:UTC+2)**

### **EIDWT-S3: Data Security and Privacy**

**Chair: Hiroyoshi Miwa, Kwansai Gakuin University, Japan**

1. SAE+Bi-GRU Based Security Situation Prediction for Smart Grid  
*Lei Chen, Mengyao Zheng, Zhaohua Liu, Fadong Chen, Kui Zhou and Bin Liu*
2. Design of identity authentication scheme for dynamic service command system based on SM2 algorithm and blockchain technology  
*Jie Deng, Lili Jiao, Lili Zhang, Yongjin Ren and Wengang Yin*



3. Visual Authentication Codes Generated Using Predictive Intelligence  
*Urszula Ogiela, Makoto Takizawa and Marek R. Ogiela*
4. Reliable Network Design Problem by Improving Node Reliability  
*Hiroki Yano, Sumihiro Yoneyama, and Hiroyoshi Miwa*
5. Toward Secure K-means Clustering Based on Homomorphic Encryption in Cloud  
*Zheng Tu, Xu An Wang, Yunxuan Su, Ying Li, Jiasen Liu*
6. On the Insecurity of a Certificateless Public Verification Protocol for the Outsourced Data Integrity in Cloud Storage  
*Xu An Wang, Xiaozhong Pan, Lixian Wei and Yize Zhao*

**EIDWT-S4: Nature Inspired Computing for Collective Intelligence****Chair: Shinji Sakamoto, Kanazawa Institute of Technology, Japan**

1. A Soldering Motion Analysis System for Danger Detection Considering Object Detection and Attitude Estimation  
*Tomoya Yasunaga, Tetsuya Oda, Nobuki Saito, Aoto Hirata, Chihiro Yukawa, Yuki Nagai, Masaharu Hirota*
2. Performance Evaluation of a Soldering Training System Based on Haptics  
*Kyohei Toyoshima, Tetsuya Oda, Chihiro Yukawa, Tomoya Yasunaga, Aoto Hirata, Nobuki Saito, Leonard Barolli*
3. Performance Evaluation of WMNs by WMN-PSOHC Hybrid Simulation System Considering Two Instances and Normal Distribution of Mesh Clients  
*Shinji Sakamoto and Leonard Barolli*
4. Improved Butterfly Optimization Algorithm Fused with Beetle Antennae Search  
*Jianghao Yin, Na Deng*
5. Design of a Robot Vision System for Microconvex Recognition  
*Chihiro Yukawa, Tetsuya Oda, Nobuki Saito, Aoto Hirata, Tomoya Yasunaga, Kyohei Toyoshima, Kengo Katayama*
6. Path Control Algorithm for Weeding AI Robot  
*Misato Shiba and Hiroyoshi Miwa*

**Thursday, March 3, 2022****Parallel Sessions****13:00-14:30 (Japan time zone: UTC+9)****06:00-07:30 (Europe time zone:UTC+2)****EIDWT-S5: Green Computing and IoT Applications****Chair: Evjola Spaho, Polytechnic University of Tirana, Albania**

1. An Energy-Efficient Algorithm to Make Virtual Machines Migrate in a Server Cluster  
*Dilawaer Duolikun, Tomoya Enokido, Leonard Barolli and Makoto Takizawa*
2. Energy Consumption Model of a Device Supporting Information Flow Control in the IoT  
*Shigenari Nakamura, Tomoya Enokido, and Makoto Takizawa*
3. A Fuzzy-based System for Assessment of QoS of V2V Communication Links in SDN-VANETs  
*Ermioni Qafzezi, Kevin Bylykbashi, Phudit Ampririt, Makoto Ikeda, Keita Matsuo, Leonard Barolli*
4. Reliable and low-cost digital transformation technology using Progressive Web Apps in Fog Computing architecture for Small and Medium Industries in Indonesia  
*Zulkifli Tahir, Amil Ahmad Ilham, Ais Prayogi Alimuddin, Muhammad Zulfadly A. Suyuti and Charina*
5. A Low-Cost Solution for Smart-city Based on Public Bus Transportation System Using Opportunistic IoT  
*Evjola Spaho, Andrea Koroveshi*

**EIDWT-S6: Network Protocols and Algorithms****Chair: Tomoya Enokido, Rissho University, Japan**

1. Performance Analysis of RIWM and RDVM Router Replacement Methods for WMNs by WMN-PSOSA-DGA Hybrid Simulation System Considering Stadium Distribution of Mesh Clients  
*Admir Barolli, Shinji Sakamoto, Leonard Barolli*
2. An Energy-Efficient Process Replication to Reduce the Execution of Meaningless Replicas  
*Tomoya Enokido, Dilawaer Duolikun and Makoto Takizawa*
3. A Byzantine Fault Tolerant Protocol for Realizing the Blockchain  
*Akihito Asakura, Shigenari Nakamura, Dilawaer Duolikun, Tomoya Enokido, Kuninao Nashimoto and Makoto Takizawa*
4. Performance Evaluation of a DQN-Based Autonomous Aerial Vehicle Mobility Control Method in an Indoor Single-path Environment With a Staircase  
*Nobuki Saito, Tetsuya Oda, Aoto Hirata, Chihiro Yukawa, Masaharu Hirota, Leonard Barolli*
5. A Delaunay Edge and CCM-based SA Approach for Mesh Router Placement Optimization in WMN: A Case Study for Evacuation Area in Okayama City  
*Aoto Hirata, Tetsuya Oda, Nobuki Saito, Tomoya Yasunaga, Kengo Katayama, Leonard Barolli*

6. A Fuzzy-Based System for Safe Driving in VANETs Considering Impact of Driver Impatience on Stress Feeling Level  
*Kevin Bylykbashi, Ermioni Qafzezi, Phudit Ampririt, Makoto Ikeda, Keita Matsuo, Leonard Barolli*

### Parallel Sessions

**15:00-16:30 (Japan time zone: UTC+9)**

**08:00-09:30 (Europe time zone:UTC+2)**

#### **EIDWT-S7: Intelligent Algorithms and Machine Learning**

**Chair: Makoto Ikeda, Fukuoka Institute of Technology, Japan**

1. A ML-based System for Predicting Flight Coordinates Considering ADS-B GPS Data: Problems and System Improvement  
*Kazuma Matsuo, Makoto Ikeda, Leonard Barolli*
2. Fault Detection from Bend Test Images of Welding Using Faster R-CNN  
*Shigeru Kato, Takanori Hino, Hironori Kumeno, Shunsuke Kume, Tomomichi Kagawa, Hajime Nobuhara*
3. An Efficient Local Search for the Maximum Clique Problem on Massive Graphs  
*Kazuho Kanahara, Tetsuya Oda, Elis Kulla, Akira Uejima and Kengo Katayama*
4. A Method for Reducing Number of Parameters of Octave Convolution in Convolutional Neural Networks  
*Yusuke Gotoh, Yu Inoue*
5. The Principal Dimensions Optimization of Large Ships Based on Improved Firefly Algorithm  
*Jianghao Yin, Na Deng*
6. FPGA Implementation of a Interval Type-2 Fuzzy Inference for Quadrotor Attitude Control  
*Tomoaki Matusi, Tetsuya Oda, Chihiro Yukawa, Tomoya Yasunaga, Nobuki Saito, Aoto Hirata, Leonard Barolli*

#### **EIDWT-S8: Database, Knowledge Discovery, Semantics and Mining**

**Chair: Olivia Fachrunnisa, UNISSULA, Indonesia**

1. An Improved Density Peaks-based Graph Clustering Algorithm  
*Lei Chen, Heding Zheng, Zhaohua Liu, Qing Li, Lian Guo and Guangsheng Liang*
2. Community Division Algorithm Based on Node Similarity and Multi-Attribute Fusion  
*Du Tiansi, Deng Na and Chen Weijie*
3. Research on TCM Patent Annotation to Support Medicine R&D and Patent Acquisition Decision-Making  
*Du Tiansi, Deng Na, Chen Weijie*
4. An Algorithm for GPS Trajectory Compression Preserving Stay Points  
*Shota Iiyama, Tetsuya Oda and Masaharu Hirota*
5. Blockchain for Islamic HRM: Potentials and Challenges on Psychological Work Contract  
*Olivia Fachrunnisa, Fannisa Assyilah*

6. Human-Value Orientation as Center For Business Transformation Model In Digital Era  
*Ardian Adhiatma, Nurhidayati*

**EIDWT-2022 Keynote II**  
**17:30-18:30 (Japan time zone: UTC+9)**  
**10:30-11:30 (Europe time zone:UTC+2)**

**EIDWT-2022 Keynote Talk II**

**Prof. Lidia Dominika Ogiela:** Human centered approaches in transformative computing applications

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**Friday, March 4, 2022**

**EIDWT-2022 Steering Committee Meeting and Discussion**

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Online Meeting Schedule for EIDWT-2022  
2 March to 4 March, 2022

1 <sup>st</sup> day: Wednesday, 2 March, 2022	Room #1 Meeting ID: 873 5759 1981		Room #2 Meeting ID: 864 7839 8178	
	Session title	Session Chair	Session title	Session Chair
<b>Slot 1</b> 13:00-14:00 (UTC+9:00) 06:00-7:00 (UTC+2:00)	<b>EIDWT-2022 Keynote #1: Prof. Alex Thomo</b> Meeting ID: 873 5759 1981			
<b>Slot 2</b> 15:30-17:00(UTC+9:00) 8:30-10:00(UTC+2:00)	EIDWT-S1	Elis Kulla, JP	EIDWT-S2	Juggapong Natwichai, TH
<b>Slot 3</b> 17:30-19:00(UTC+9:00) 10:30-12:00(UTC+2:00)	EIDWT-S3	Hiroyoshi Miwa, JP	EIDWT-S4	Shinji Sakamoto, JP
2 <sup>nd</sup> day: Thursday, 3 March, 2022	Room #1 Meeting ID: 873 5759 1981		Room #2 Meeting ID: 864 7839 8178	
	Session title	Session Chair	Session title	Session Chair
<b>Slot 1</b> 13:00-14:30 (UTC+9:00) 6:00-7:30(UTC+2:00)	EIDWT-S5	Evjola Spaho, Albania	EIDWT-S6	Tomoya Enokido, JP
<b>Slot 3</b> 15:00-16:30(UTC+9:00) 8:00-9:30(UTC+2:00)	EIDWT-S7	Makoto Ikeda, JP	EIDWT-S8	Olivia Fachrunnisa, Indonesia
<b>Slot 1</b> 17:30-18:30(UTC+9:00) 10:30-11:30 (UTC+2:00)	<b>EIDWT-2022 Keynote #2: Prof. Lidia Dominika Ogiela</b> Meeting ID: 873 5759 1981			
3rd day: Friday, 4 March, 2022	Room #1		Room #2	
	Session title	Session Chair	Session title	Session Chair
	<b>EIDWT-2022 Steering Committee Meeting and Discussion</b>			

### Additional information

The session schedules indicated in the program are based on the UTC+9:00 time zone.