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| **IUKM 2023** | **The 10th International Symposium onIntegrated Uncertainty in Knowledge Modelling and Decision Making****Ishikawa, Japan, November 2 – 4, 2023****JAIST – ISHIKAWA HIGH-TECH CENTER** **1-1 Asahidai, Nomi, Ishikawa 923-1211** |

**THU, 2nd NOVEMBER [Japan Advanced Institute of Science and Technology]**

**8:00 – 9:00** **Registration**

**The Fourth International Symposium on
Integrated Uncertainty in Knowledge Modelling and Decision Making**

**9:00 – 9:30** **Opening** [KS Lecture Hall, 2nd floor, KS Building]

* **Greetings by JAIST Vice-President Youji Kohda**
* **Opening Remarks by General Chair Masahiro Inuiguchi**
* **IUKM 2023 Brief Summary: Katsuhiro Honda, Bac Le, Van-Nam Huynh**

**9:30 – 10:30** Plenary 1 [KS Lecture Hall]

####  **On Uncertainty in Partially Identified Models**

**Hung T. NGUYEN**,New Mexico State University, USA; Chiang Mai University, Thailand

**Chair: Vladik KREINOVICH**

**10:30 – 11:00** Coffee break [Entrance Door, ground floor of KS Building]

**11:00 – 12:00** Plenary 2 [KS Lecture Hall]

####  **Two Classes of Fuzzy Clustering: Their Theoretical Contributions**

**Sadaaki MIYAMOTO**,University of Tsukuba, Japan

**Chair:** **Masahiro INUIGUCHI**

**12:00 – 13:30** Lunch [Lunch boxes will be served]

**13:30 – 15:30** Parallel Session 1: **Uncertainty Management and Decision Support I [**KS Lecture Hall**]**

 **Chair: Churn-Jung Liau**

 Many-valued Judgment Aggregation – Some New Possibility Results

 *Sebastian Uhl,* *Christian G. Fermuller*

 Free Quantification in Four-Valued and Fuzzy Bilattice-Valued Logics

 *Libor Behounek, Martina Daňková, Antonin Dvorak*

Weighted Fuzzy Rules Based on Implicational Quantifiers

 *Martina Daňková*

Differentially Private Probabilistic Social Choice in the Shuffle Model

*Ding Qingyuan, Keke Sun, Lixin Jiang, HB Zhou, Chunlai Zhou*

Exploring the Impact of Randomness in Roguelike Deck-Building Games: A Case Study of Slay the Spire

*SangGyu Nam, Pavinee Rerkjirattikal*

**13:30 – 15:30** Parallel Session 2: **Pattern Classification and Data Analysis I [**Collaboration Room 3**]**

 **Chair: Yuchi Kanzawa**

Rockfall Isolation Technique Based on DC-DBSCAN with *k*-Means Clustering and *k*-Nearest Neighborhood

*Patthranit Kaewcharuay, Pannathorn Sathirasattayanon, Thanapat Khemniwat, Thanakon Augsondit, Kasorn Galajit, Jessada Karnjana, Sasiporn Usanavasin*

A Novel Noise Clustering based on Local Outlier Factor

 *Yukihiro Hamasuna, Yoshitomo Mori*

On Some Fuzzy Clustering Algorithms Based on Series Models

*Tomoki Nomura, Yuchi Kanzawa*

On Some Fuzzy Clustering for Series Data

*Yuto Suzuki, Yuchi Kanzawa*

Collaborative Filtering Based on Rough C-Means Clustering with Missing Value Processing

*Seiki Ubukata, Kazushi Futakuchi*

**13:30 – 15:30** Parallel Session 3: **Economic Applications I [**Collaboration Room 1**]**

 **Chair: Roengchai Tansuchat**

Variable Selection Methods-based Analysis of Macroeconomic Factors for an Enhanced GDP Forecasting: A Case Study of Thailand

 *Roengchai Tansuchat, Pichayakone Rakpho, Chaiwat Klinlampu*

Revolutionizing SET50 Stock Portfolio Management with Deep Reinforcement Learning

 *Sukrit Thongkairat, Donlapark Ponnoprat, Phimphaka Taninpong, Woraphon Yamaka*

Analysis of Exchange Rate Fluctuations in Japan and Thailand by Using Copula-based Seemingly Unrelated Regression Model

*Kongliang Zhu, Xuefeng Zhang, Pensri Jaroenwanit*

The Perspective for the Economy in Cambodia, Laos, Myanmar, Vietnam and Thailand: Economic Growth, Inequality, and Environmental Considerations

*Chanamart Intapan, Chukiat Chaiboonsri, Banjaponn Thongkaw*

Economic Condition, Multidimensional Poverty and NEETs in Thailand [Online]

*Supanika Leurcharusmee, Piyaluk Buddhawongsa*

**15:30 – 16:00** Coffee break [Entrance Door, ground floor of KS Building]

**16:00 – 17:40** Parallel Session 4: **Machine Learning I [**KS Lecture Hall**]**

 **Chair: Canh-Hao Nguyen**

Inference Problem in Probabilistic Multi-Label Classification

 *Vu-Linh Nguyen, Xuan-Truong Hoang, Van-Nam Huynh*

A Federated Learning Model for Linear Fuzzy Clustering with Least Square Criterion

 *Katsuhiro Honda, Ryosuke Amejima*

Joint Multiple Efficient Neighbors and Graph Learning Method for Multi-view Clustering

 *Vicenç Torra, Fatemeh Sadjadi*

Maximum-Margin Nearest Prototype Classifiers with the Sum-over-others Loss Function and a Performance Evaluation

*Yoshifumi Kusunoki*

**16:00 – 17:40** Parallel Session 5: **Optimization and** **Statistical Methods I [**Collaboration Room 1**]**

 **Chair: Bao Q. Ta**

The a Priori Procedure for Estimating the Cohen's Effect Size under Independent Skew Normal Settings

*Cong Wang, Tonghui Wang, Xiangfei Chen, David Trafimow, Tingting Tong, Liqun Hu, S. T. Boris Choy*

Fast - Asymptotically Optimal - Methods for Determining the Optimal Number of Features

 *Saeid Tizpaz-Niari, Luc Longpre, Olga Kosheleva, Vladik Kreinovich*

Immune-Based Algorithm for the Multi-Server Home Care Service Problem with Various Frequencies: An Example of Taiwan

*Yi-Chih Hsieh, Peng-Sheng You, Ta-Cheng Chen*

0-1 Combinatorial Optimization Problems with Qualitative and Uncertain Profits [Online]

*Tuan Anh VU, Sohaib AFIFI, Eric Lefèvre, Frédéric Pichon*

**16:00 – 17:40** Parallel Session 6: **Security and Privacy in Machine Learning [**Collaboration Room 3**]**

 **Chair: Vicenç Torra**

A Novel Privacy-preserving Federated Learning Model based on Secure Multi-party Computation

*Sang Pham Xuan, Tu Anh Tran, The Dung Luong*

An Elliptic Curve-based Privacy-Preserving Recommender System

 *Van Vu-Thi, The Dung Luong*

A Method against Adversarial Attacks to Enhance the Robustness of Deep Learning Models

*Phi Ho Truong, Duy Trung Pham*

Orand - A Fast, Publicly Verifiable, Scalable Decentralized Random Number Generator based on Distributed Verifiable Random Functions [Online]

*Minh Nhat Pham, Dung Anh Tran, Khuong Nguyen-An*

**18:00 – 19:00** Move to Kanazawa International Hotel

**19:00 – 21:00** **Welcome Reception** [**Kanazawa International Hotel**]

(After the reception, buses will transport participants to Kanazawa station, Komatsu station, and High-Tech Center/JAIST)

**FRI, 3rd NOVEMBER [Ishikawa High-Tech Center]**

 **9:00 – 10:00** Plenary 3 [Conference Hall]

**The Fourth International Symposium on
Integrated Uncertainty in Knowledge Modelling and Decision Making**

 **Contrastive Discovery of Hierarchical Achievements in Reinforcement Learning**

**Hyun Oh SONG**, Seoul National University, Korea

**Chair:** **Katsuhiro HONDA**

**10:00 – 10:30** Coffee break

**10:30 – 12:30** Parallel Session 7: **Uncertainty Management and Decision Support II**

 **Chair:** **Hung-Son Nguyen**

 Application of Interval Valued Fuzzy Sets in Attribute Ranking

 *Bich Khue Vo, Hung-Son Nguyen*

 Utilization of Data Envelopment Analysis for Grid Traffic Accident Data

 *Daisuke Maruyama, Masahiro Inuiguchi, Naoki Hayashi, Hirosato Seki*

Different Types of Decision Criteria in a Decision Problem

 *Tomoe Entani*

Reasoning about Games with Possibilistic Uncertainty

*Churn-Jung Liau*

Extending Kryszkiewicz's Formula of Missing Values in Terms of Lipski's Approach

*Michinori Nakata, Norio Saito, Hiroshi Sakai, Takeshi Fujiwara*

**10:30 – 12:30** Parallel Session 8: **Machine Learning II**

 **Chair: Anand Nayyar**

 Predicting Stock Price Fluctuations Considering the Sunny Effect

 *Tomoya Matsuki, Kenta Nakaniwa, Makishi Iguchi, Notsu Akira, Katsuhiro Honda*

 Proposal of New Classification Method Using Rule Table and Its Consideration

 *Yuichi Kato, Tetsuro Saeki*

TouriER: Temporal Knowledge Graph Completion by Leveraging Fourier Transforms [Online]

 *Thanh Vu, Huy Ngo, Ngoc-Trung Nguyen, Thanh N Le*

Controlling LIME Kernel Width to Achieve Comprehensible Explanations on Tabular Data [Online]

  *Hai Duong, Lam Hoang, Bac Le*

Machine Learned KPI Goal Preferences for Explainable AI-based Production Sequencing [Online]

*Rudolf Felix*

**10:30 – 12:30** Parallel Session 9: **Pattern Classification and Data Analysis II**

 **Chair: Yoshifumi Kusunoki**

 Identifying Topics on Social Impact from S&P1500 CSR/ESG Reports

 *Farukh Hamza, Ping-Yu Hsu, Wan-Yu Yang, Ming Shien Cheng, Yu-Chun Chen*

Descriptor-based Information Systems and Rule Learning from Different Types of Data Sets with Uncertainty

 *Hiroshi Sakai, Michinori Nakata*

MFG-HUI: An Efficient Algorithm for Mining Frequent Generators of High Utility Itemsets [Online]

*Hai Duong, Thong Tran, Tin Truong, Bac Le*

Negative Sentiments Make Review Sentences Longer: Evidence from Japanese Hotel Review Sites

*Takumi Kato*

Collaborative Filtering Based on Probabilistic Rough Set C-Means Clustering

*Seiki Ubukata, Kazuma Ehara*

**12:30 – 13:30** Lunch [Lunch boxes will be served]

**13:30 – 14:30** Plenary 4 [Conference Hall]

 **Random Fuzzy Sets and Belief Functions: Application to Machine Learning**

**Thierry DENOEUX,** University of Technology of Compiegne, France

**Chair: Van-Nam HUYNH**

**14:30 – 15:00** Coffee break

**15:00 – 17:00** Parallel Session 10: **Optimization and** **Statistical Methods II**

 **Chair: Tonghui Wang**

Forecasting Precious Metals Prices Volatility with the Global Economic Policy Uncertainty Index: the GARCH-MIDAS Technique for Different Frequency Data

 *Rungrapee Phadkantha, Roengchai Tansuchat, Payap Tarkhamtham, Wiranya Puntoon*

Lasso and Ridge for GARCH-X Models

 *Woraphon Yamaka, Paravee Maneejuk, Sukrit Thongkairat*

Mean-Variance Portfolio Allocation using ARMA-GARCH-Stable and Artificial Neural Network Models

*Nguyen T. Anh, Mai D. Lam, and Bao Q. Ta*

Predicting Maize Yields with Satellite Information [Online]

*Singh Ratna, Ping-Yu Hsu, You-Sheng Shih, Ming-Shien Cheng, Yu-Chun Chen*

Why Inverse Layers in Pavement? Why Zipper Fracking? Why Interleaving in Education? A General Explanation

*Edgar Daniel Rodriguez Velasquez, Aaron Velasco, Olga Kosheleva, Vladik Kreinovich*

**15:00 – 17:00** Parallel Session 11: **Machine Learning III**

 **Chair: Hiroshi Sakai**

Unearthing Undiscovered Interests: Knowledge-enhanced Representation Aggregation for Long-tail Recommendation

 *Zhipeng Zhang, Yuhang Zhang, Tianyang Hao, Zuoqing Li, Yao Zhang, Masahiro Inuiguchi*

 A Novel Methodology for Real-time Face Mask Detection using PSO Optimized CNN Technique

 *Anand Nayyar, Nhu Gia Nguyen, Sakshi Natani, Ashish Sharma, Sandeep Vyas*

A Computer Vision-Based Framework for Behavior Monitoring and Estrus Detection through Dynamic Behavioral Analysis

*Panisara Kanjanarut, Warut Pannakkong, Sun Olapiriyakul, Nuttapong Sanglerdsinlapachai, Shoichi Hasegawa*

Information Fusion for Enhancing Presentation Attack Detection in Iris Recognition [Online]

*Kharidtha Ruangsariyanont, Jittarin Chaivong, Suradej Duangpummet, Waree Kongprawechnon*

Score-level Fusion Based on Classification Tree for Improving Iris Verification Systems

*Oranus Kotsuwan, Puntika Leepagorn, Suradej Duangpummet, Jessada Karnjana*

**15:00 – 17:00** Parallel Session 12: **Economic Applications II**

 **Chair: Woraphon Yamaka**

Dynamics of Investor Behavior and Market Interactions in the Thai Stock Market: A Regime-switching Analysis

  *Panisara Phochanachan, Supanika Leurcharusmee, Nootchanat Pirabun*

Does Cryptocurrency Improve Forecasting Performance of Exchange Rate Returns?

 *Somsak Chanaim, Chatchai Khiewngamdee*

The perspective of the creative economy Stimulus on the Thai Economy: Explication by BSTS mixed with the CGE model

*Kanchana Chokethaworn, Paponsun Eakkapun, Chukiat Chaiboonsri, Banjaponn Thongkaw*

Spatial Spillover Effect of Provincial Institutional Quality in Vietnam

*Viet Quoc Nguyen and Chon Van Le*

Examining the Risk Contribution of Major Stock Markets to the Global Equity Market during the COVID-19 Pandemic

*Namchok Chimprang, Nattakit Intawong, Woraphon Yamaka*

### 17:00 – 18:00 Move to Kanazawa International Hotel (bus service is provided)

**18:00 – 20:00** **Gala Dinner**

**Chairs**: **Masahiro Inuiguchi, Youji Kohda, Vladik Kreinovich, Katsuhiro Honda, Van-Nam Huynh**

* **Welcoming Speech by JAIST President TERANO Minoru**
* **Banquet with a Special Event to honor Prof. Hung T. Nguyen and Prof. Sadaaki Miyamoto**

(After the gala dinner, buses will transport participants to Kanazawa station, Komatsu station, and High-Tech Center/JAIST)

**SAT, 4th NOVEMBER [Japan Advanced Institute of Science and Technology]**

**9:00 – 10:40** Parallel Session 13: **Pattern Classification and Data Analysis III [**Collaboration Room 1**]**

**The Fourth International Symposium on
Integrated Uncertainty in Knowledge Modelling and Decision Making**

**Chair: Seiki Ubukata**

 On Parameter Extension of *q*-Divergence-based Fuzzy *c*-Means Clustering

*Yuchi Kanzawa*

On Some Fuzzy Clustering based on the Multivariate Power Exponential Distribution

*Yuta Suzuki, Yuchi Kanzawa*

Sustainable Perishable Food Distribution: Fresh Consumption and Waste Justice

 *Sun Olapiriyakul, Warut Pannakkong*

Leveraging Artificial Neural Networks to Improve Profitability of Technical Trading Rules in Thailand SET 100 Index [Online]

*Jantakarn Wannasuk, Rujira Chaysiri*

**9:00 – 10:40** Parallel Session 14: **Uncertainty Management and Decision Support III [**Collaboration Room 3**]**

**The Fourth International Symposium on
Integrated Uncertainty in Knowledge Modelling and Decision Making**

**Chair: Tomoe Entani**

 Application of Game Theory: Agricultural Land Fragmentation in Thailand [Online]

*Natthawan Sriphong, Nantapath Trakultraipruk*

Team Orienteering Problem: An Arc-Based Formulation [Online]

*Nguyen Thuy Trang, Pham Duc Tai, Jirachai Buddhakulsomsiri, Parthana Parthanadee*

A Measure of Similarity for Reference Class Forecasting in Projects

*Seyed Ashkan Zarghami*

An Evidential Reasoning Approach to Evaluating Health-care Waste Treatment Methods

*Trong-Hiep Hoang, Vu Ngoc Thanh Le, Van-Nam Huynh*

**9:00 – 11:00** Parallel Session 15: **Economic Applications III [**Collaboration Room 2**]**

**The Fourth International Symposium on
Integrated Uncertainty in Knowledge Modelling and Decision Making**

**Chair: Chon Van Le**

Efficiency of the ASEAN-5 Stock Markets: A Markov-Switching Model Estimation using Adjusted Market Inefficiency Magnitude

*Wilawan Srichaikul, Somsak Chanaim, Woraphon Yamaka*

Spatial Regression Analysis of FDI and Economic Development: The World Perspective

*Rungrapee Phadkantha, Rossarin Osathanunkul, Jirapa Inthisang Trochim, Woraphon Yamaka*

Predicting Chinese Stock Prices Using Convertible Bond: An Evidence-Based on Neural Network Approach

*Namchok Chimprang,* *Paravee Maneejuk, Binxiong Zou*

An Analysis of the Influence of the Ukraine-Russia Conflict on Renewable and Fossil Energy Price Cycles

*Wiranya Puntoon,* *Nuttaphong Kaewtathip , Woraphon Yamaka, Paravee Maneejuk*

Can Monetary Policy Uncertainty Predict Exchange Rate Volatility? New Evidence from Hybrid Neural Network-GARCH Model

*Paravee Maneejuk, Terdthiti Chitksame, Pichayakone Rakpho*

**11:00 – 12:30 Closing and Farewell Lunch**