



## CONFERENCE ROOMS

### Friday 7th

Sessions will be held at Enrique D'Etigny Auditorium, located at the new building of the Faculty, located in Beauchef 851, Santiago.

### Saturday 8th - Tuesday 11th

Sessions will be held at the old building of the Industrial Engineering Department, located in Domeyko 2338, Santiago.

#### Keynote Talks

IRSS Fellow Plenary Talks  
Memorial  
Parallel Sessions Track A

Parallel Sessions Track B



Join us for a visit to Chile's finest producer of organic and biodynamic wines; Odfjell Vineyards. This unique experience starts with a visit to the Odfjell estate where the beautiful Norwegian Fjord horses are bred, followed by a walk through the vineyards and the plant, and finishing with a tasting of three exceptional wines.

## OPTIONAL TRIP

**Odfjell Vineyards Visit**  
Tuesday 11th, 14:00 – 18:00 hrs.



ODFJELL

## CONFERENCE SCHEDULE

UNIVERSIDAD DE CHILE  
SANTIAGO, CHILE

## TIMETABLE

FRIDAY 7		SATURDAY 8		SUNDAY 9		MONDAY 10		TUESDAY 11	
08:00 - 09:00	REGISTRATION	08:00 - 09:00	REGISTRATION						
09:00 - 10:20	Rough Set Tutorial - Part 1 Davide Ciucci, Dominik Szlak, Yiyu Yao	09:00 - 10:20	SA - A1	09:00 - 10:20	SA - B1	09:00 - 10:20	SU - A1	09:00 - 10:20	SU - B1
10:20 - 10:35	COFFEE BREAK	10:20 - 10:35	COFFEE BREAK	10:20 - 10:35	COFFEE BREAK	10:20 - 10:35	COFFEE BREAK	10:20 - 10:35	COFFEE BREAK
10:35 - 11:35	Rough Set Tutorial - Part 2 Davide Ciucci, Dominik Szlak, Yiyu Yao	10:35 - 11:35	KN 3: Qinghua Hu	10:35 - 11:35	KN 4: Ernestina Menasalvas	10:35 - 11:35	KN 5: Xiaohua Hu	10:35 - 11:35	KN 6: Pawan Lingras
11:35 - 11:50	COFFEE BREAK	11:35 - 11:50	COFFEE BREAK	11:35 - 11:50	COFFEE BREAK	11:35 - 11:50	COFFEE BREAK	11:35 - 11:50	COFFEE BREAK
11:50 - 12:30	OPENING CEREMONY	11:50 - 12:30	SA - A2	11:50 - 12:30	SA - B2	11:50 - 12:30	SU - A2	11:50 - 12:30	SU - B2
12:30 - 13:30	IRSS Fellow Plenary Talk 1 Roman Slowinski	12:30 - 13:30	SA - A2	12:30 - 13:30	SA - B2	12:30 - 13:30	SU - A2	12:30 - 13:30	SU - B2
13:30 - 14:30	LUNCH	13:30 - 14:30	LUNCH	13:30 - 14:30	LUNCH	13:30 - 14:30	LUNCH	13:30 - 14:30	LUNCH
14:30 - 15:30	KN 1: Pablo A. Estevez	14:30 - 15:30	IRSS Fellow Plenary Talk 2 Sanhar K. Pal	14:30 - 15:30	Memorial Session - Part 1	14:30 - 15:30	IRSS Fellow Plenary Talk 4 Lech T. Polkowski	14:30 - 15:30	IRSS Fellow Plenary Talk 6 Masahiro Inui
15:30 - 15:45	COFFEE BREAK	15:30 - 15:45	COFFEE BREAK	15:30 - 15:45	COFFEE BREAK	15:30 - 15:45	COFFEE BREAK	15:30 - 15:45	COFFEE BREAK
15:45 - 16:45	KN 2: Marco Orellana	15:45 - 16:45	IRSS Fellow Plenary Talk 3 Davide Ciucci	15:45 - 16:45	Memorial Session - Part 2	15:45 - 16:45	IRSS Fellow Plenary Talk 5 Shusaku Tsumoto	15:45 - 16:45	Optional Conference Trip
16:45 - 17:00	COFFEE BREAK	16:45 - 17:00	COFFEE BREAK	16:45 - 17:00	COFFEE BREAK	16:45 - 17:00	COFFEE BREAK	16:45 - 17:00	Optional Conference Trip
17:00 - 18:00	Mining Tutorial Wojciech Moczulski	17:00 - 18:00	IRSS Business Meeting	17:00 - 18:00	Memorial Session - Part 3	17:00 - 18:00	IRSS Fellow Plenary Talk 6 Masahiro Inui	17:00 - 18:00	Optional Conference Trip
	WELCOME RECEPTION		CONFERENCE BANQUET		FREE		FAREWELL GATHERING		Optional Conference Trip

Tutorial  
Parallel Sessions  
Keynote Talk  
IRSS Fellow Plenary Talk  
Memorial Session

ORGANIZERS:



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# PROGRAM

## FRIDAY 7th

Rough Set Tutorial	
Part 1	09:00 - 10:20
Part 2	10:35 - 11:35

### Rough Sets: Decision Making, Data Mining, Knowledge Representation

SPEAKERS: *Davide Ciucci, Dominik Slezak, Yiyu Yao*  
CO-AUTHORS: *Salvatore Greco, Jouni Jarvinen, Tianrui Li, Hung Son Nguyen, Andrzej Skowron*

### IRSS Fellow Plenary Talk 1

SESSION CHAIR: *Yiyu Yao*  
**Robust Group Decision under Uncertainty and Rule Preference Model**  
SPEAKER: *Roman Slowinski*

### Keynote Talk 1

SESSION CHAIR: *Richard Weber*  
**Big Data Era Challenges and Opportunities in Astronomy: How Computational Intelligence / Machine Learning Can Contribute?**  
SPEAKER: *Pablo A. Estevez*

### Keynote Talk 2

SESSION CHAIR: *Claudio Meneses*  
**"Digital CODELCO": Towards Future Mining**  
SPEAKER: *Marco Orellana Silva*

### Mining Tutorial

**Modern ICT and Mechatronic Systems in Contemporary Mining Industry**  
SPEAKER: *Wojciech Moczulski*  
CO-AUTHORS: *Piotr Przystalka, Marek Sikora, Radoslaw Zimroz*

## SATURDAY 8th

Parallel Session	SA - A1
Rough Sets, Non-Determinism and Incompleteness 1	09:00 - 10:20

SESSION CHAIR: *Mohamed Quafafou*

**Infobright's Approach for Approximate Querying**  
*Rick Glick, Dominik Slezak*

**Definability in Incomplete Information Tables**  
*Mengjun Hu, Yiyu Yao*

**Rough Sets by Indiscernibility Relations in Data Sets Containing Possibilistic Information**  
*Michinori Nakata, Hiroshi Sakai*

**Matrix-based Rough Set Approach for Dynamic Probabilistic Set-valued Information Systems**  
*Yanyong Huang, Tianrui Li, Chuan Luo, Shi-jinn Horng*

Parallel Session	SA - B1
Ranking and Clustering 1	09:00 - 10:20

SESSION CHAIR: *Lukasz Sosnowski*

**Exploiting Group Pairwise Preference Influences for Recommendations**  
*Kunlei Zhu, Jiajin Huang, Ning Zhong*

**Discrete Group Search Optimizer for Community Detection in Social Networks**  
*Moustafa Mahmoud Ahmed, Mohamed M. Elwakil, Aboul Ella Hassanien, Ehab Hassanien*

**Learning Latent Features for Multi-view clustering based on NMF**  
*Mengjiao He, Yan Yang, Hongjun Wang*

**A Semantic Overlapping Clustering Algorithm for analyzing short-texts**  
*Lipika Dey, Kunal Ranjan, Ishan Verma, Abir Naskar*

### Keynote Talk 3

SESSION CHAIR: *Andrzej Janusz*  
**When Rough Sets Meet Kernels: Kernelized Rough Sets and Some Extensions**  
SPEAKER: *Qinghua Hu*

Parallel Session	SA - A2
Fuzziness, Similarity and Aggregation 1	11:50 - 13:30

SESSION CHAIR: *Murat Diker*

**Multigranulation Rough Sets in Hesitant Fuzzy Linguistic Information Systems**  
*Chao Zhang, De-Yu Li, Yan-Hui Zhai*

**Multi-Granularity Similarity Measure of Cloud Concept**  
*Jie Yang, Guoyin Wang, Xukun Li*

**Uncertainty of A Multigranulation Fuzzy Information System**  
*Tao Feng, Jusheng Mi*

**Multi-adjoint Concept Lattices, Preferences and Bousi Prolog**  
*M. Eugenia Cornejo, Jesus Medina, Eloisa Ramirez-Poussa, Clemente Rubio-Manzano*

**Modified Generalized Weighted Fuzzy Petri Net in Intuitionistic Fuzzy Environment**  
*Sibasis Bandyopadhyay, Zbigniew Suraj, Piotr Grochowalski*

Parallel Session	SA - B2
Data Mining and Decision Making 1	11:50 - 13:30

SESSION CHAIR: *Masahiro Inuiguchi*

**Feature Selection in Decision Systems with Constraints**  
*Sinh Hoa Nguyen, Marcin Szczuka*

**Governance of the Redundancy in the Feature Selection based on Rough Sets' reducts**  
*Marek Grzegorowski*

**Automatic generation of explanations from a Rule-based Expert System and Ontology**  
*Yahima Hadfeg, Victor Flores, Juan Bekios, Claudio Meneses*

**Attribute Reduction in Multi-source Decision Systems**  
*Yanting Guo, Weihua Xu*

**Matrix Algorithm for Distribution Reduction in Inconsistent Ordered Information Systems**  
*Xiaoyan Zhang, Ling Wei*

### IRSS Fellow Plenary Talk 2

SESSION CHAIR: *Jose Merigo*  
**50+ Years of Fuzzy Sets: Data to Knowledge**  
SPEAKER: *Sankar K. Pal*

### IRSS Fellow Plenary Talk 3

SESSION CHAIR: *Hiroshi Sakai*  
**Back to the Beginnings: Pawlak's Definitions of the Terms Information System and Rough Set**  
SPEAKER: *Davide Ciucci*

## SUNDAY 9th

Parallel Session	SU - A1
Rough Sets, Approximation and Granulation 1	09:00 - 10:20

SESSION CHAIR: *John Stell*

**Rough Sets are  $\epsilon$ -Accessible**  
*Mohamed Quafafou*

**Textural Unit Operations in Rough Set Theory**  
*Murat Diker, Aysegul Altay Ugur, Sadik Bayhan*

**Refinements of Orthopairs and IUML-algebras**  
*Stefano Aguzzoli, Stefania Boffa, Davide Ciucci, Brunella Gerla*

**Rough Approximations Induced by Orthocomplementations in Formal Contexts**  
*Tong-Jun Li, Wei-Zhi Wu, Shen-Ming Gu*

Parallel Session	SU - B1
Rough Sets and Three-way Decisions 1	09:00 - 10:20

SESSION CHAIR: *Bing Zhou*

**Variance based Determination of Three-way Decisions Using Probabilistic Rough Sets**  
*Nouman Azam, Jingtao Yao*

**Determining Thresholds in Three-Way Decisions with Chi-Square Statistic**  
*Cong Gao, Yiyu Yao*

**A Three-way Decision Clustering Approach for High-dimensional Data**  
*Hong Yu, Haibo Zhang*

**Three-way Decisions based Multi-label Learning Algorithm with Label Dependency**  
*Feng Li, Duoqian Miao, Wei Zhang*

### Keynote Talk 4

SESSION CHAIR: *Victor Flores*  
**Clinical Narrative Analytics Challenges**  
SPEAKER: *Ernestina Menasalvas*  
CO-AUTHORS: *Alejandro Rodriguez-Gonzalez, Roberto Costumero, Hector Ambit, Consuelo Gonzalo*

Parallel Session	SU - A2
Data Mining and Decision Making 2	11:50 - 13:30

SESSION CHAIR: *Qinghua Hu*

**Construction of Clinical Care Schedule**  
*Haruko Iwata, Shusaku Tsumoto*

**An Intelligent System Prototype to support and sharing diagnoses of maligned tumors: a proposal**  
*Victor Flores, Aldo Quelopana*

**Performance Comparison to a Classification Problem by the Second Method of Quantification and STRIM**  
*Yuya Kitazaki, Tetsuro Saeki, Yuichi Kato*

**Outlier Detection and Elimination in Stream Data – an Experimental Approach**  
*Mateusz Kalisch, Marcin Michalak, Piotr Przystalka, Marek Sikora, Lukasz Wrabel*

**Formal Analysis of HTM Spatial Pooler Performance under Predefined Operation Conditions**  
*Marcin Pietron, Maciej Wielgosz, Kazimierz Wiatr*

### Parallel Session

Parallel Session	SU - B2
Rough Sets and Three-way Decisions 2	11:50 - 13:30

SESSION CHAIR: *JingTao Yao*

**A Decision-Theoretic Rough Set Approach to Multi-Class Cost-Sensitive Classification**  
*Guojian Deng, Xiuyi Jia*

**Research on cost-sensitive method for boundary region in three-way decision model**  
*Yanping Zhang, Gang Wang, Jie Chen, Liandi Fang, Shu Zhao, Ling Zhang, Xiangyang Wang*

**Utilizing DTRS for Imbalanced Text Classification**  
*Bing Zhou, Yiyu Yao, Qingzhong Liu*

**Optimistic Decision-theoretic Rough Sets in Multi-covering Space**  
*Caihui Liu, Meizhi Wang*

**Cost-Sensitive Sequential Three-Way Decisions Based on Deep Neural Networks**  
*Libo Zhang, Huaxiong Li, Xian-Zhong Zhou, Bing Huang*

### Memorial Session - Part 1

SESSION CHAIR: *Dominik Slezak*  
**Zdzislaw Pawlak - A Renaissance Man**  
*Ryszard Janicki*

**Prof. Zdzislaw Pawlak, Father of Rough Sets: Some Sweet Memories**  
*Sankar K. Pal*

**The Born and Growing of Chinese Rough Set Community with Help of Professor Zdzislaw Pawlak**  
*Guoyin Wang*

### Memorial Session - Part 2

SESSION CHAIR: *Guoyin Wang*  
**Recent Development of Rough Computing: A Scientometrics View**  
*JingTao Yao, Adeniyi Onasanya*

**A bibliometric overview of rough sets theory**  
*Jose Merigo, Richard Weber, Dominik Slezak*

**A bibliometric overview of research in Information Sciences**  
*Jose Merigo, Witold Pedrycz, Richard Weber*

### Memorial Session - Part 3

SESSION CHAIR: *Sankar K. Pal*  
**Professor Pawlak the Boost of our research**  
*Ernestina Menasalvas*

**Rough Definability in Classification of Diseases**  
*Shusaku Tsumoto*

**Various Interpretations of Definability in Pawlak Rough Set Theory**  
*Yiyu Yao*

## MONDAY 10th

Parallel Session	MO - A1
Rules, Trees and Ensembles 1	09:00 - 10:20

SESSION CHAIR: *Marcin Szelag*

**On Behavior of Statistical Indices in Incremental Context**  
*Shusaku Tsumoto, Shoji Hirano*

**Data Anonymization with Imprecise Rules**  
*Masahiro Inuiguchi, Keisuke Washimi, Hiroki Ichida*

**Classification for Inconsistent Decision Tables**  
*Mohammad Azad, Mikhail Moshkov*

**On NIS-Apriori based Data Mining in SQL**  
*Hiroshi Sakai, Chenxi Liu, Xiaoxin Zhu, Michinori Nakata*

### Parallel Session

Parallel Session	MO - B1
Rough Sets, Non-Determinism and Incompleteness 2	09:00 - 10:20

SESSION CHAIR: *Ernestina Menasalvas*

**A Rough Perspective on Information in Extensive Form Games**  
*Georg Peters*

**Towards Coordination Game Formulation in Game-theoretic Rough Sets**  
*Yan Zhang, JingTao Yao*

**Probabilistic Estimation for Generalized Rough Modus Ponens and Rough Modus Tollens**  
*Ning Yao, Duoqian Miao, Zhifei Zhang, Guangming Lang*

**Application of Probabilistic Rough Sets to Email Segmentation**  
*Chien-Chung Chan, Arvind Srinivasan, Gaurav Baone*

### Keynote Talk 5

SESSION CHAIR: *Chien-Chung Chan*  
**Big Data Analysis in Social Media Applications**  
SPEAKER: *Xiaohua Hu*

Parallel Session	MO - A2
Ranking and Clustering 2	11:50 - 13:30

SESSION CHAIR: *Xiaohua Hu*

**Discriminating Customer Segments Using Rough Sets**  
*Andrzej Janusz*

**Fuzzy Temporal Meta-clustering of Financial Trading Volatility Patterns**  
*Pawan Lingras, Farhana Haider, Matt Triff*

**White-box Library for Implementing Networks of Comparators**  
*Lukasz Sosnowski, Dominik Slezak*

**Supervised and Rough Semi-Supervised Identification of Users and Activities from Wearable Device Brain Signal Recordings**  
*Glavin Wiechert, Matt Triff, Pawan Lingras*

**Social Web Videos Clustering Based on Ensemble Technique**  
*Vinath Mekthanavanh, Tianrui Li*

### Parallel Session

Parallel Session	MO - B2
Fuzziness, Similarity and Aggregation 2	11:50 - 13:30

SESSION CHAIR: *Clemente Rubio-Manzano*

**The induced ordered weighted average multiplication**  
*Jose Merigo, Sigifredo Laengle*

**Induced heavy ordered weighted moving averages**  
*Ernesto Leon Castro, Luis Perez Arellano, Ezequiel Aviles Ochoa, Jose Merigo*

**Rough-Fuzzy Support Vector Clustering with OWA Operators**  
*Ramiro Saltos, Jose Merigo, Richard Weber*

**Fuzzy Multi-Label Classification of Customer Complaint Logs under Noisy Environment**  
*Tirthankar Dasgupta, Lipika Dey, Ishan Verma*

**Some Weighted Ranking Operators with Interval Valued Intuitionistic Fuzzy Information Applied to Outsourced Software Project Risk Assessment**  
*Zhen-hua Zhang, Yong Hu, Zhao Chen, Shenguo Yuan, Kui-xi Xiao*

### IRSS Fellow Plenary Talk 4

SESSION CHAIR: *Marcin Szczuka*  
**Rough Sets of Zdzislaw Pawlak Give New Life to Old Concepts. A Personal View**  
SPEAKER: *Lech T. Polkowski*

### IRSS Fellow Plenary Talk 5

SESSION CHAIR: *Duoqian Miao*  
**Decision Support based on Analysis of Big Data**  
SPEAKER: *Shusaku Tsumoto*

### IRSS Fellow Plenary Talk 6

SESSION CHAIR: *Jerzy Blaszczynski*  
**Rough Set Approaches to Imprecise Modeling**  
SPEAKER: *Masahiro Inuiguchi*

## TUESDAY 11th

Parallel Session	TU - A1
Data Mining and Decision Making 3	09:00 - 10:20

SESSION CHAIR: *Yoshifumi Kusunoki*

**Similarity-based Classification with Dominance-based Decision Rules**  
*Marcin Szelag, Salvatore Greco, Roman Slowinski*

**Rough Set Based Image Estimation System for the Importance of the Region of Interest in Mammograms**  
*Wei Peng, Rene Mayorga, Esam Hussein*

**On Bringing Together Big Data and Data Science**  
*Andrzej Janusz, Sirshendu Ghosh*

**Representative-based Active Learning with Max-Min Distance**  
*Fu-Lun Liu, Fan Min, Liu-Ying Wen, Hong-Jie Wang*

Parallel Session	TU - B1
Fuzziness, Similarity and Aggregation 3	09:00 - 10:20

SESSION CHAIR: *Ryszard Janicki*

**Towards preferences on fuzzy rough sets from discrete t-norms**  
*M. Eugenia Cornejo, Jesus Medina, Eloisa Ramirez-Poussa, Clemente Rubio-Manzano*

**Textures and Fuzzy Unit Operations in Rough Set Theory**  
*Murat Diker*

**Interpretations of Lower Approximations in Inclusion Degrees**  
*Wei-Zhi Wu, Chao-Jun Chen, Xia Wang*

**An Order-Preserving Intuitionistic Fuzzy Distance and Its Evaluation System Based on Quadrangular Axiom**  
*Zhen-hua Zhang, Chao Ma, Jinhui Xu, Yong Hu, Shenguo Yuan*

### Keynote Talk 6

SESSION CHAIR: *Georg Peters*  
**Advances in Rough and Soft Clustering: Meta-Clustering, Dynamic Clustering, Data-Stream Clustering**  
SPEAKER: *Pawan Lingras*  
CO-AUTHOR: *Matt Triff*

Parallel Session	TU - A2
Rules, Trees and Ensembles 2	11:50 - 13:30

SESSION CHAIR: *Sebastian Maldonado*

**Linguistic Variables Construction in Information Table**  
*Shusaku Tsumoto, Shoji Hirano*

**A Kernel Method for Rule-based Classifiers**  
*Yoshifumi Kusunoki*

**Multi-Objective Search for Comprehensible Rule Ensembles**  
*Jerzy Blaszczynski, Bartosz Prusak, Roman Slowinski*

**The Boosting and Bootstrap Ensembles for the Pair Classifier Based on the Dual Indiscernibility Matrix**  
*Przemyslaw Gorecki, Piotr Artiemjew, Lech Polkowski, Bartosz Nowak*

**Consistency Driven Feature Subspace Aggregating for Ordinal Classification**  
*Jerzy Blaszczynski, Jerzy Stefanowski, Roman Slowinski*

Parallel Session	TU - B2
Rough Sets, Approximation and Granulation 2	11:50 - 13:30

SESSION CHAIR: *Pawan Lingras*

**On Optimal Approximations of Arbitrary Relations by Partial Orders**  
*Ryszard Janicki*

**On Approximation of Relations by Generalized Closures and Generalized Kernels**  
*Agnieszka D. Bogobowicz, Ryszard Janicki*

**Ordered Information Systems and Graph Granulation**  
*John Stell*

**Some Pawlakian Aspects of Multiset Approximation Spaces**  
*Zoltan Csajbok, Jozsef Kodmon*

**A Broad Outline of Software Implementation of Multiset Approximation Spaces**  
*Zoltan Csajbok, Jozsef Kodmon, Peter Takacs*

KEY: 