

Curriculum Vitality

Takashi Washio, Ph.D.
Associate Professor
Institute for Scientific and Industrial Research
Osaka University

Summary

Takashi Washio is an associate professor in the division of Intelligent Systems Science at the Institute of Scientific and Industrial Research of Osaka University since 1996. Before joining the university, he had been a visiting researcher of Nuclear reactor laboratory of Massachusetts Institute of Technology (MIT) from 1988 to 1990 and a researcher in Mitsubishi Research Institute from 1990 to 1996. In Nuclear reactor laboratory of MIT, he studied the principles of diagnosis and control of nuclear power reactor based on the artificial intelligence and the system identification theory, and developed a prototype system of automated diagnosis and control of space nuclear reactor engine. In the meantime, he studied an approach of causal ordering in complex systems based on the generic physical knowledge. In Mitsubishi Research Institute, he studied the theories and the algorithms of qualitative reasoning and causal reasoning while developing the techniques for safety analysis, human reliability analysis, and decision support for the operation of the large scale systems such as power plants and communication networks. He also developed some new sensing techniques for plant diagnosis. His current main interest is the development of the theories and the algorithms for the automated discovery of first principle equations from numerical data and the development of the theories and the algorithms for complete search to extract frequent patterns from graph structured data. He received his Bs, Ms, and PhD degree in nuclear engineering from Tohoku University, and he has been a research affiliate of MIT since he left MIT. He is now on the editorial board of *New Generation Computing*. He is a member of AAAI, JSAI, IPSJ, JSFSTS, and SICE. He received the JSAI best paper awards from Japanese Society for Artificial Intelligence (2001) and the Best Paper Awards of AESJ from Atomic Energy Society of Japan (1996).

1. Personal Data

Name: Takashi Washio
Title: Associate Professor
Affiliation: Department of Advanced Reasoning,
Division of Intelligent Systems Science,
Institute for Scientific and Industrial Research (I.S.I.R.),
Osaka University
Address: 8-1, Mihogaoka, Ibarakishi, Osaka, 567-0047, Japan
Phone: +81-6-6879-8541
Fax: +81-6-6879-8544
E-mail: washio@ar.sanken.osaka-u.ac.jp
Date of Birth: October, 30th, 1960
Age: 42

2. Biography:

Education

- April, 1979 Entered to Nuclear Engineering Department, Faculty of Engineering, Tohoku University
- March, 1983 Graduated Nuclear Engineering Department, Faculty of Engineering, Tohoku University
- April, 1983 Entered to Master Course of Nuclear Engineering, Upper Graduated School of Engineering, Tohoku University
- March, 1985 Took Ms.E. in Nuclear Engineering, Upper Graduated School of Engineering, Tohoku University
- April, 1985 Entered to Ph.D. Course of Nuclear Engineering, Upper Graduated School of Engineering, Tohoku University
- March, 1988 Took Ph.D. in Nuclear Engineering, Upper Graduated School of Engineering, Tohoku University
- April, 1987 - March, 1988 JSPS Research Fellow for Young Scientists

Job

- April, 1988 - January, 1990 Visiting Researcher in Nuclear Reactor Laboratory, Massachusetts Institute of Technology (MIT)
- February, 1990 - Present Research Affiliate of Nuclear Reactor Laboratory, Massachusetts Institute of Technology (MIT)
- February, 1990 Junior Researcher, Safety Engineering Division, Mitsubishi Research Institute Inc.
- April, 1991 Researcher, Safety Engineering Division, Mitsubishi Research Institute Inc.
- April, 1994 Senior Researcher, Safety Engineering Division, Mitsubishi Research Institute Inc.
- April, 1995 - March, 1997 Visiting Researcher of Monju Construction Office, Power Reactor and Nuclear Fuel Development Corporation
- July, 1995 - Present Collaborative Researcher of The Institute of Statistical Mathematics
- June, 1996 - Present Associate Professor, Department of Advanced Reasoning, Division of Intelligent Systems Science, Institute for Scientific and Industrial Research (I.S.I.R.), Osaka University

3. Degree Theses

PhD from Nuclear Engineering, Upper Graduated School of Engineering, Tohoku University (March, 1988)

- Development of a Failure Symptom Derivation System and a Failure Diagnosis System for Nuclear Power Plants

Ms from Nuclear Engineering, Upper Graduated School of Engineering, Tohoku University (March, 1985)

- Development of an Anomaly Symptom Diagnosis System for Nuclear Power Plants based on Knowledge Engineering Approaches

Bs from Nuclear Engineering Department, Faculty of Engineering, Tohoku University (March, 1983)

- Research on an Intelligent System for Radio Active Rays Measurement

4. Awards

May, 2001 JSAI Best Paper Awards

- Scientific Law Discovery based on Scale Type Constraint

November, 1999 Best Paper Awards for the Annual Conference of Japanese Society for Artificial Intelligence

- Scientific Law Discovery from Observed Data and its Application to Socio-psychology

October, 1998 Best Paper Awards for Annual Conference of Japanese Society for Artificial Intelligence

- The Extended SDS: A Model of Scientific Discovery for Simultaneous Equation Systems

December, 1997 Encouragement Awards of Japanese Society for Artificial Intelligence

- A Method of Discovering the First Principles Based on Scale-based Reasoning and its Implementation

June, 1997 Best Paper Awards for Annual Conference of Japanese Society for Artificial Intelligence

- A Data-driven Method to Discover the First Principle of Complex Systems

December, 1996 Encouragement Awards of Japanese Society for Artificial Intelligence

- Abduction-based Evaluation among Multiple Axiomatic Systems and its Application

March, 1996 The Best Paper Award of Atomic Energy Society of Japan

- Criteria of Diversity Evaluation for Intelligent Diagnosis of Nuclear Power Plants

August, 1995 Best Paper Awards for Annual Conference of Japanese Society for Artificial Intelligence

- A Method of History-Oriented Envisioning by Introducing Temporal Logic

February, 1988 Premium Paper Awards of the Society of Instrument and Control Engineers

- An Attempt of Fuzzy Qualitative Reasoning

5. Membership of Academic Society

Human Interface Society since 2002

Information Processing Society of Japan since 1999

Japan Ergonomics Society from 1995 to 1998

Japan Society for Fuzzy Theory and Systems since 1991

Japanese Society for Artificial Intelligence since 1989

American Association for Artificial Intelligence since 1988

Atomic Energy Society of Japan from 1988 to 1999

American Nuclear Society from 1987 to 1996

The Society of Instrument and Control Engineers since 1985

6. Research Experience

June, 1996 Associate Professor, Department of Advanced Reasoning,

- Present Division of Intelligent Systems Science,
Institute for Scientific and Industrial Research (I.S.I.R.),
Osaka University

- Discovery of a first principle equation from experimental and numerical data
- Discovery of a first principle equation from observed and numerical data
- Discovery of first principle simultaneous equations from experimental and numerical data
- Discovery of first principle simultaneous equations from observed and numerical data
- Complete search for extracting frequent patterns from graph structured data by Apriori-based graph mining (AGM)
- Extension of Apriori-based graph mining (AGM) toward the application to wider areas
- Discretization of numeric data by Akaike's information criterion (AIC) and minimum description length (MDL)
- Reduction of association rules by maximal inference sets and Apriori algorithm
- Feature generation method based on association rules
- Fast classification method by using sub-sampling and Bagging
- Identification and analysis of non-equilibrium thermodynamics from time series data analysis
- Efficient approximate method of extracting typical patterns from graph structured

data by graph based induction (GBI)

- Integration of incremental knowledge acquisition from human expert and incremental machine learning from data in unstable environment within the framework of Ripple Down Rule method
- Models of synthesis, its language and algorithm

April, 1994 Senior Researcher, Safety Engineering Division,

- May, 1996 Mitsubishi Research Institute Inc

- Diagnosis for multiple faults of components and sensor by using model based diagnosis
- History-oriented envisioning to predict behaviors of process systems in qualitative reasoning
- Abduction-based reasoning among multiple axiomatic systems
- Worm-type agents for intelligent operation of large-scale man-machine systems
- Organization learning in multi-agent systems
- Autonomous recovery execution in nuclear power plant by agent
- Diversity criteria for control and sensing instruments of nuclear power plants
- Adaptive microphone array technique for remote monitoring of components in nuclear power plants

February, 1990 Junior Researcher, Researcher, Safety Engineering Division,

- March, 1994 Mitsubishi Research Institute Inc.

- Causal reasoning based on inherent causal structure of physical law formulae
- Human reliability analysis based on fuzzy integral modeling
- Decision support for operability improvement and maintenance planning by analytic hierarchy process (AHP) methodology

April, 1988 Visiting Researcher in Nuclear Reactor Laboratory,

- January, 1990 Massachusetts Institute of Technology (MIT)

- Development of a quantitative and symbolic causal reasoning method for spacecraft nuclear reactors
- Derivation of exogenously-driven causality based on assumptive structural equations
- Stability considerations concerning the implementation of the MIT-SNL period-generated minimum time control laws

7. Academic Activities

Editorial Board

07/1997 – Present	Editorial board of New Generation Computing
10/1995 – 09/1995	Editorial board of Journal of Atomic Energy Society of Japan

Program Chairs and Organizers

10/2001- Present	Tutorial Chair of ICDM02: The 2002 IEEE International Conference on Data Mining
05/2001	Program Chair of KDD Challenge 2001 International Workshop (JKDD01) of Japanese Society for Artificial Intelligence
04/2000	Local Arrangement Chair of PAKDD2000: The Forth Pacific-Asia Conference on Knowledge Discovery and Data Mining

Program Committee

10/2001 - Present	Program Committee of ICML02: The Nineteenth International Conference on Machine Learning
10/2001 - Present	Program Committee of ICDM02: The 2002 IEEE International Conference on Data Mining
10//2001- Present	Program Committee of DX'02: Thirteenth International Workshop on Principles of Diagnosis
09/2001-08/2002	Program Committee of DaWaK 2002: Fourth International Conference on Data Warehousing and Knowledge Discovery
04/2001-10/2001	Program Committee of WI-2001: The First Asia-Pacific Conference on Web Intelligence
10//2000 – 09/2001	Program Committee of DX'01: Twelfth International Workshop on Principles of Diagnosis
09/2000 - 08/2001	Program Committee of DaWaK 2001: Third International Conference on Data Warehousing and Knowledge Discovery
10//1999 – 09/2000	Program Committee of DX'00: Eleventh International Workshop on Principles of Diagnosis
07/1999 – 06/2000	Program Committee of ICML-2000: Seventeenth International Conference on Machine Learning
05/1999 - 04/2000	Program Committee of PAKDD2000: Fourth Pacific-Asia

12/1998 – 11/1999	Conference on Knowledge Discovery and Data Mining Program Committee of RSFDGrC'99: Seventh International Workshop on Rough Sets, Data Mining, and Granular-Soft Computing
10/1998 – 09/1999	Program Committee of AAAI99: Annual Conference of Japanese Society for Artificial Intelligence
10/1998 – 09/1999	Program Committee of DX99: Tenth International Workshop on Principles of Diagnosis
05/1998 - 04/1999	Program Committee of PAKDD99: Third Pacific-Asia Conference on Knowledge Discovery and Data Mining
10/1997 – 09/1998	Program Committee of AAAI98: Annual Conference of Japanese Society for Artificial Intelligence
04/1994 – 03/1995	Program Committee of IEEE/IFES'95: The International Joint Conference of the Fourth International Conference on Fuzzy Systems and the Second International Fuzzy Engineering Symposium
10/1996 – 09/1997	Program Committee of DX'97: Eighth International Workshop on Principles of Diagnosis
10/1995 – 09/1996	Program Committee of DX'96: Seventh International Workshop on Principles of Diagnosis

SIGs and Working Groups

01/2002 – 08/2002	MYCOM2002 of Japanese Society for Artificial Intelligence, Member of Arrangement Committee
01/2001 – 08/2001	MYCOM2001 of Japanese Society for Artificial Intelligence, Member of Arrangement Committee
04/1998 – Present	SIG-ICS (Intelligence and Complex Systems) Information Processing Society of Japan, Affiliate Member from 04/1998 – Present
08/1997 - Present	Member of Activity Planning Committee of Japanese Society for Artificial Intelligence
11/1996 – Present	SIG-IS (Intelligent Systems) of The Society of Instrument and Control Engineers, Board Member from 11/1996.
04/1996 – Present	SIG-FAI (Foundation of Artificial Intelligence) of Japanese Society for Artificial Intelligence, Board Member from 04/1998 to 03/2000

04/1995 – 06/1996	Member of Kanto District Activity Planning Committee of Japan Society for Fuzzy Theory and Systems, Board Member from 04/1995 to 06/1996
04/1995 – 03/1997	SIG-FEP (Fuzzy Evaluation Problem) of Japan Society for Fuzzy Theory and Systems, Board Member from 04/1995 to 03/1997
04/1995 – Present	SIG-MMS (Man-Machine Systems) of Atomic Energy Society of Japan, Board Member from 04/1995.
04/1994 – Present	SIG-KBS (Knowledge-Based Systems) of Japanese Society for Artificial Intelligence, Affiliation Member from 04/1994.
04/1993 – 03/1995	SIG-MMS (Man-Machine Systems) of Atomic Energy Society of Japan, Affiliation Member from 04/1993 to 03/1995

Invited Talks

“Conditions of Law Equations and the Approach of their Discovery,” International Conference on Advances in Infrastructure for Electronic Business, Education, Science and Medicine on the Internet (SSGRR 2002w), L'Aquila, Italy, January, 26, 2002

8. Publication Lists

Journal Papers

Masahiro Terabe, Takashi Washio, Hiroshi Motoda: Fast Classification by S3Bagging, Journal of Information Processing Society of Japan, Vol.42, No.SIG 14 (TOM 5) (2001)

Akihiro Inokuchi, Takashi Washio, Takashi Okada and Hiroshi Motoda: Applying the Apriori-based Graph Mining Method to Mutagenesis Data Analysis, Journal of Computer Aided Chemistry, Vol.2, pp.87-92 (2001)

Satoshi Hori⁹, Yoshikazu Taki, Takashi Washio, Hiroshi Motoda: Watchdog System of Market Quality by Using Data Mining, Journal of the Institute of Electrical Engineering of Japan, C (Division of Electronics, Information and System), Vol.121-C, No.8 ,pp. 1289-1295 (2001)

Takashi Matsuda, Hiroshi Motoda and Takashi Washio: Graph-Based Induction for General Graph Structure and Its Application, Journal of Japanese Society for Artificial Intelligence, Vol.16, No.4, pp.363-374 (2001)

Takashi Washio and Hiroshi Motoda: Discovering Scientific Simultaneous Equation Models for Large Scale Systems, Journal of Japanese Society for Artificial Intelligence, Vol. 15, No. 6, pp.1107-1116 (2000)

Akihiro Inokuchi, Takashi Washio, Hiroshi Motoda, Kouhei Kumasawa and Naohide Arai: Complete and Fast Mining Method of Frequent Graph Patterns, Journal of Japanese Society for Artificial Intelligence, Vol. 15, No. 6, pp.1052-1063 (2000)

Takashi Washio and Hiroshi Motoda: Discovering Scientific Law Equations Based on Scale-Type Constraints, Journal of Japanese Society for Artificial Intelligence, Vol.15, No.4, pp.681-692 (2000)

Toshihiro Kayama, Tadashi Horiuchi, Hiroshi Motoda and Takashi Washio: Learning Classification Rules from Tree Structured Data Based on Iterative Pair Chunking, Journal of Japanese Society for Artificial Intelligence, Vol.15, No.3 (2000) (to appear)

Masahiro Terabe, Osamu Katai, Tetsuo Sawaragi, Takashi Washio and Hiroshi

Motoda: Feature Generation Method Based on Association Rules, *Journal of Japanese Society for Artificial Intelligence*, Vol.15, No.1, pp.187-197 (2000)

Takuya Wada, Tadashi Horiuchi, Hiroshi Motoda, Takashi Washio: Determination Criteria of Default Knowledge Based on Character Evaluation of Knowledge Acquisition in Ripple Down Rules Method, *Journal of Japanese Society for Artificial Intelligence*, Vol.15, No.1, pp.177-186 (2000)

H. Motoda and T. Washio : Discovery of Laws, *IEICE Transactions of Information and Systems*, Vol.E83-D, No.1, pp.44-51 (2000)

Y. Niwa, M. Terabe and T. Washio: Autonomous Recovery Execution in Nuclear Power Plant by the Agent, *Cognition, Technology & Work*, 1: pp.197-210, Springer-Verlag London Limited (1999)

Takashi Washio, Hiroshi Motoda: Constructive Law Equation Discovery Based on Scale-Type Identification of Feature Quantity, *Journal of Japanese Cognitive Science Society*, Vol.5, No.2, pp.80-94 (1998)

T. Washio and H. Motoda: Discovery of First-Principle Equations Based on Scale-Type-Based and Data-Driven Reasoning, Special Issue, *KDD: Techniques & Applications, Knowledge-Based Systems*, Vol.10, No.7, pp.403-411, Elsevier (1998)

T. Washio, M. Sakuma and M. Kitamura: A New Approach to Quantitative and Credible Diagnosis for Multiple Faults of Components and Sensors, *Artificial Intelligence*, Vol.91, No.1, pp.103-130, Special Issue: Artificial Intelligence Research in Japan, Elsevier (1997)

Takashi Washio, Masatake Sakuma, Hiroshi Furukawa and Masaharu Kitamura: Diversity Criteria for Intelligent Diagnosis of Nuclear Power Plants, *J. Nucl. Sci. Technol*, Vol.37, No.12, pp.1128-1136 (1995)

Hiroshi Furukawa, Keiji Kuchimura, Takashi Washio and Masaharu Kitamura: Information Diversity for Intelligent Diagnosis of Nuclear Power Plant, *J. Nucl. Sci. Technol*, Vol.37, No.8, pp.729-739 (1995)

Takashi Washio, Masatake Sakuma, Masaharu Kitamura: Quantitative and Reliable Diagnosis Method for Multiple Failures of Components and Sensors, J. Nucl. Sci. Technol, Vol.9, No.5 pp.719-729 (1994)

T. Washio and M. Kitamura: Adaptive Microphone Array Technique for Remote Monitoring of Components in Nuclear Power Plants, J. Nucl. Sci. Technol., Vol.31, No.2, pp.91-101 (1994)

Takashi Washio, Yutaka Kitamura and Hideaki Takahashi: Human Reliability Analysis of Plant Manipulation Task Based on Fuzzy Integral, J. Nucl. Sci. Technol, Vol.33, No.10, pp.983-993 (1991)

Takashi Washio: Derivation of Exogenously Driven Causality Based on Physical Laws, Journal of Japanese Society for Artificial Intelligence, Vol.5, No.4, pp.482-491 (1990)

M. Kitamura, M. Takahashi, T. Washio and K. Sugiyama: Synthesis of Heuristic Knowledge Base for Supporting Development of Goal-Oriented Reactor Noise Analysis Programs, Progress in Nuclear Energy., Vol.21, pp.213-221 (1988)

T. Washio, M. Kitamura and K. Sugiyama: Development of Failure Diagnosis Method Based on Transient Information of Nuclear Power Plant, J. Nucl. Sci. Technol., Vol.24, No.6, pp.452-461 (1987)

T. Washio, M. Kitamura and K. Sugiyama: Qualitative Simulation of Power Plant Dynamics Based on Design knowledge, Control-Theory and Advanced Technology., Vol.2, No.3, pp.433-449 (1986)

T. Washio, M. Kitamura, K. Kotajima and K. Sugiyama: Automated Derivation of Failure Symptoms for Diagnosis of a Nuclear Power Plant, Ann. Nucl. Energy., Vol.13, No.8, pp.459-465 (1986)

M. Kitamura, T. Washio, K. Kotajima and K. Sugiyama: Small-Sample Modeling Method for Nonstationary Reactor Noise Analysis, Ann. Nucl. Energy., Vol.12, No.8, pp.399-407 (1985)

M. Kitamura, T. Washio, K. Kotajima and K. Sugiyama: Development of Methods for

Analyzing Time-Varying Characteristics of Power Reactor Noise, Progress in Nuclear Energy., Vol.15, pp.57-65 (1985)

International Conference Papers

Takashi Washio: Conditions of Law Equations and the Approach of their Discovery, Proc. Of International Conference on Advances in Infrastructure for Electronic Business, Education, Science and Medicine on the Internet: SSGRR 2002w, No.83 (2002)

Takashi Washio and Hiroshi Motoda: A Method to Discover Admissible Model Equations from Observed Data, Working Notes of 4th International Workshop on Similarity Methods, pp.231-246 (2001)

Makoto Tsukada, Takashi Washio and Hiroshi Motoda: Automatic Web-Page Classification by Using Machine Learning Methods, Web Intelligence Research and Development (Proc. Of First Asia Pacific Conf., WI2001), LNAI2198, Springer, pp.303-313 (2001)

Takashi Washio, Hiroshi Motoda and Yuji Niwa: Discovering Admissible Simultaneous Equation Models from Observed Data, Proc. Of 12th European Conference on Machine Learning:ECML2001, pp.539-551 (2001)

Masahiro Terabe, Takashi Washio and Hiroshi Motoda: The Effect of Subsampling Rate on S3 Bagging Performance, Working Notes on Active Learning, Database Sampling, Experimental Design: Views on Instance Selection, ECML/PKDD-2001 (2001)

Takashi Washio and Hiroshi Motoda: Discovery of Law Equations Governing Human Affinity Under Trade-Off Between Cost and Risk, Proc. Of IMPS-2001: International Meeting of the Psychometric Society, pp.74 (2001)

Takayuki Ikeda, Takashi Washio and Hiroshi Motoda: Basket Analysis on Meningitis Data, New Frontiers in Artificial Intelligence, Joint JSAI 2001 Workshop Post-Proceedings, LNAI 2253, pp.516-524 (Working Notes of JSAI KDD Challenge 2001, JKDD01, pp.33-40) (2001)

Ken Ping Hew, Tetsuo Tomiyama, Takashi Washio and Yasushi Umeda: Language and

Algorithm for Synthesis, Proc. of 2000 International Symposium on Modeling of Synthesis, pp.189-205 (2000)

Hiroshi Hasegawa, Takashi Washio, Yukari Ishimiya and Takeshi Saito: Nonequilibrium Thermodynamics from Time Series Data Analysis, Proc. of Discovery Science 2000 (DS2000), Lecture Notes in Artificial Intelligence 1967, Setsuo Arikawa and Shinichi Morishita (Eds.), pp.304-305 (2000)

Takashi Matsuda, Tadashi Horiuchi, Hiroshi Motoda and Takashi Washio: Graph-Based Induction for General Graph Structured Data and Its Application to Chemical Compound Data, Proc. of Discovery Science 2000 (DS2000), Lecture Notes in Artificial Intelligence 1967, Setsuo Arikawa and Shinichi Morishita (Eds.), pp.99-111 (2000)

Takashi Washio and Hiroshi Motoda: Modeling Admissible Simultaneous Equation Systems Based on Complete Subsets and Scale-Type Constraints, Working note of Similarity Methods: 3rd International Workshop, pp.73-84 (2000)

A. Inokuchi, T. Washio, T. Okada and H. Motoda: Applying Algebraic Mining Method of Graph Substructures to Mutagenesis Data Analysis, Working notes of International Workshop of KDD Challenge on Real-world Data, KDD Challenge 2000, The Fourth Pacific-Asia Conference on Knowledge Discovery and Data Mining, pp.41-46 (2000)

A. Inokuchi, T. Washio and H. Motoda: An Apriori-based Algorithm for Mining Frequent Substructures from Graph Data, Proc. of PKDD2000: The Fourth European Conference on Principles and Practice of Knowledge Discovery in Databases, pp.13-23 (2000)

Takashi Washio, Hiroshi Motoda and Yuji Niwa: Enhancing the Plausibility of Law Equation Discovery, Proceedings of the Seventeenth International Conference on Machine Learning, ICML2000, pp.1127-1134 (2000)

A. Inokuchi, T. Washio, T. Okada and H. Motoda: Applying Algebraic Mining Method of Graph Substructures to Mutagenesis Data Analysis, Working notes of International Workshop of KDD Challenge on Real-world Data, KDD Challenge 2000, The Fourth Pacific-Asia Conference on Knowledge Discovery and Data Mining, pp.41-46 (2000)

T. Matsuda, T. Horiuchi, H. Motoda and T. Washio: Consistency Based Feature Selection, Proc. of the Fourth Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD-2000), pp.420-431 (2000)

H. Hasegawa, T. Washio and Y. Ishimiya: "Thermodynamics" from Time Series Data Analysis, Proc. of Second International Conference, Discovery Science1999 (DS'99), pp.326-327, (Lecture Notes in Artificial Intelligence 1721, Springer) (1999)

T. Matsuda, T. Horiuchi, H. Motoda, T. Washio, K. Kumazawa and N. Arai: Graph-Based Induction for General Graph Structured Data, Proc. of the Second International Conference on Discovery Science (DS'99), pp.340-342 (1999)

A. Inokuchi, T. Washio and H. Motoda: Derivation of the Topology Structure from the Massive Graph Data, Proc. of the Second International Conference on Discovery Science (DS'99), pp.330-332 (1999)

T. Washio and H. Motoda: Extension of Dimensional Analysis for Scale-types and its Application to Discovery of Admissible Models of Complex Processes, Working Notes of 2nd International Workshop on Similarity Method, pp.129-147 (1999)

T. Washio, H. Motoda and Y. Niwa: Discovering Admissible Model Equations from Observed Data Based on Scale-Types and Identity Constrains, Proc. of IJCAI'99: Sixteenth International Joint Conference on Artificial Intelligence, Vol.2, pp.772-779 (1999)

T. Washio and H. Motoda: Automated Scientific Modeling from Observed Data and its Application to Socio-Psychology, Workingnotes of QR'99: the Thirteenth International Workshop on Qualitative Reasoning, pp.240-249 (1999)

M. Terabe, O. Katai, T. Sawaragi, T. Washio and H. Motoda: A Data Pre-processing Method Using Association Rules of Attributes for Improving Decision Tree, Proc. of the Third Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD'99), pp.143-147 (1999)

Inokuchi, T. Washio and H. Motoda: Basket Analysis for Graph Structured Data, Proc. of the Third Pacific-Asia Conference on Knowledge Discovery and Data Mining

(PAKDD'99), pp.420-431 (1999)

T. Wada, T. Horiuchi, H. Motoda and T. Washio: Characterization of Default Knowledge in Ripple Down Rules Method, Proc. of the Third Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD'99), pp.284-295 (1999)

H. Motoda: Computer Assisted Discovery of First Principle Equations from Numeric Data, Invited Talk, Proc. of the Third Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD'99), pp.2-2 (1999)

K. P. Hew, T. Washio, T. Tomiyama and Y. Umeda: A Mathematical theory of Synthesis Design: Foundation, Framework, Logic and Application, Proc. of International Symposium on Modeling of Synthesis, pp.19-31 (1998)

T. Washio and H. Motoda: Development of SDS2: Smart Discovery System for Simultaneous Equation Systems, Discovery Science, Lecture Notes in Artificial Intelligence 1532 pp.352-363 (1998)

T. Wada, T. Horiuchi, H. Motoda and T. Washio: A New Look at Default Knowledge in Ripple Down Rules Method, Proc. of the 1998 Pacific Rim Knowledge Acquisition Workshop (PKAW'98), pp.171-186 (1998)

Y. Niwa, M. Terabe and T. Washio: Collaborative Emergency Operation Man-Machine System, Proc. of 7th IFAC/IFIP/IFORS/IEA Symposium on Analysis, Design and Evaluation of Man-Machine Systems, pp.461-466 (1998)

T. Washio and H. Motoda: Discovering Admissible Simultaneous Equations of Large Scale Systems, Proc. of the Fifteenth National Conference on Artificial Intelligence (AAAI-98) pp.189-196 (1998)

S. Hori, Y. Kawashima, T. Yukimatsu, H. Taki, T. Washio and H. Motoda: A Watchdog System for Field Quality - A Basket Analysis Approach -, Proc. of US-Japan FA Symposium, Vo.2, pp.741-748 (1998)

T. Washio, H. Matsuura and H. Motoda: Mining Association Rules for Estimation and Prediction, Proc. of the Second Pacific-Asia Conference on Knowledge Discovery and

Data Mining (PAKDD'98), pp.417-419 (1998)

T. Washio and H. Motoda: Structured Evaluation Based on Axiomatic Measurement, Working notes of PRESTO "Information and Human Activity" Workshop, pp.14-17 (1998)

T. Washio, H. Motoda, T. Kayama and H. Matsuura: Role of KDD in Autonomous Operation of Large Scale Systems, Proc. of the International Symposium on Artificial Intelligence, Robotics and Intellectual Human Activity Support for Nuclear Applications, pp.201-210 (1997)

T. Washio and H. Motoda: Discovering Admissible Models of Complex Systems Based on Scale-Types and Identity Constraints, Proc. of IJCAI'97: Fifteenth International Joint Conference on Artificial Intelligence, Vol.2, pp.810-817 (1997)

T. Tomiyama, T. Murakami, T. Washio, A. Kubota, H. Takeda, T. Kiriyama, Y. Umeda, and M. Yoshioka: The Modeling of Synthesis - From the Viewpoint of Design Knowledge - Proc. of International Conference on Engineering Design (ICED'97), Vol.3, pp.97-100 (1997)

H. Motoda, T. Washio, T. Kayama and K. Yoshida: Extracting Behavioral Patterns from Relational History Data, Proc. of the Workshop on Machine Learning for User Modeling to be held in conjunction with Sixth International Conference on User Modeling, (1997)

M. Takahashi, K. Fukui, T. Washio and M. Kitamura: Information Provision System for Maintenance Support Based on Augmented Reality and Network Computing, Proc. of the MARCON 97: International Conference on Maintenance and Reliability, pp.64.01-64.10 (1997)

T. Washio and H. Motoda: Discovery of First Principle Based on Data-Driven Reasoning, Proc. of the First Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD'97), pp.169-182 (1997)

T. Washio and M. Kitamura: Identification of Hidden Factors in Subjective Evaluation of Man-Machine Interface, Proc. of CSEPC'96: Cognitive Systems Engineering in Process Control, pp.172-175 (1996)

Y. Niwa, T. Washio and M. Terabe: An Agent-Based Emergency Operating Procedure in Nuclear Power Plant, Proc. of CSEPC'96: Cognitive Systems Engineering in Process Control, pp.107-113 (1996)

T. Washio and H. Motoda: Discovery of Possible Law Formulae Based on Measurement Scale, Proc. of the Fourth International Workshop on Rough Sets, Fuzzy Sets and Machine Discovery, pp.209-216 (1996)

T. Washio and H. Motoda: Discovery of Possible Law Equations by Combined Use of Scale-Based and Data-Driven Reasoning, Working Note of PKAW'96: The Pacific Knowledge Acquisition Workshop, pp.130-149 (1996)

T. Washio, J. Okusa and A. Endou: Intelligent virtual measurements in a process plant based on model-based diagnosis, DX-96: Seventh International Workshop on Principles of Diagnosis, pp.249-257 (1996)

T. Washio, H. Motoda and M. Kitamura: Decision Process Modeling Based on Consensus Among Fuzzy Integral and AHP, Proc. of the 4th International Conference on Soft Computing, Vol.1, pp.308-311 (1996)

T. Washio and H. Motoda: A History-oriented Envisioning Method, Proc. of PRICAI'96 (4th Pacific Rim International Conference on Artificial Intelligence), pp. 312-323 (1996)

M. Terabe, T. Washio, O. Katai and T. Sawaragi: A Study of Organization Learning in Multiagent Systems, Proc. of ECAI'96 Workshop on Learning in Distributed Artificial Intelligence Systems: Working Notes, pp.110-119 (1996)

T. Washio and H. Motoda: Scale-Based Reasoning on Possible Law Equations, AAAI Technical Report: Qualitative Reasoning, The Tenth International Workshop, pp.255-264 (1996)

T. Washio and M. Kitamura: Worm-Type Agents for Intelligent Operation of Large-Scale Man-Machine Systems, Symbiosis of Human and Artifact (Proc. of HCI International '95: 6th International Conference on HUMAN-COMPUTER INTERACTION), Y. Anzai, K. Ogawa and H. Mori Eds., Elsevier Science B.V., pp.925-930 (1995)

M. Kitamura, H. Furukawa, R. Koza and T. Washio: Guiding Rules for Development of Intelligent Monitoring System of Nuclear Power Plants, Proc. of SMORN VII: A Symposium on Nuclear Reactor Surveillance and Diagnostics., pp.14.5.1-14.5.9 (1995)

T. Washio and M. Kitamura: A Fast History-oriented Envisioning Method Introducing Temporal Logic, Working Papers of QR'95: The Ninth International Workshop on Qualitative Reasoning about Physical Systems pp.279-288 (1995)

T. Washio and M. Kitamura: Towards a Theory of Diversity-based Diagnosis, Working Papers of DX-94: The Fifth International Workshop on Principles of Diagnosis., pp.352-356 (1994)

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