

# Curriculum Vitae

## Tatsuo UNEMI

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### Personality

**Birth date:** January 26th, 1956, **Birth place:** Kanazawa, Ishikawa pref., Japan, **Sex:** Male.

**Nationality:** Japan, **Religion:** Buddhism.

### Employment

#### Department of Information Systems Science, Soka University

*Dean of Faculty of Science and Engineering*, 2015–Present

*Professor*, 2012–Present

*Associate Professor (Jokyōju/Junkyōju)*, 1995–2012

*Assistant Professor (Kōshi)*, 1992–1995

Teach students on Cognitive Science, Artificial Intelligence, Data Structure, Graphical User Interface Programming, and Programming Languages including Lisp, Prolog, Java, Processing and Objective-C; and work with students on Artificial Life by software approaches including combinations among evolution, development, learning and collective behavior.

#### Tokyo Institute of Technology

*Part-Time Lecturer*, 1996–1999

Make two hours lecture for undergraduate students twice per year on Artificial Life as a part of the course “Human and Society in Multi-media age” arranged by Prof. Kyōichi Kijima.

#### Laboratory for International Fuzzy Engineering Research

*Visiting Scholar and Project Leader of ROB Group*, 1992–1995

Lead a group of four researchers from private companies in ROB (Robotics) Group to build a prototype of autonomous distributed robot system that works cooperatively with human.

#### Shinanogawa Techno-Academy

*Part-Time Lecturer*, 1989–1991

Teach students on Introduction to Computer Software and Data Structure.

#### Department of Planning and Management Science, Nagaoka University of Technology

*Assistant Professor (Kōshi)*, 1987–1992

Teach students on Statistics, Programming in OPS5 and Prolog, and Cognitive Science, and work with students and faculty on Reinforcement Learning Method, Applications of Genetic Algorithms, and Design of Graphical User Interface.

## **Department of System Sciences, Tokyo Institute of Technology**

*Research Associate (Joshu)*, 1981–1987

Work with students and faculty on Knowledge Engineering, Machine Learning, Human Interface, and Programming Tools for Artificial Intelligence.

## **Education**

### **Doctor of Engineering** 1994, Tokyo Institute of Technology

Dissertation: An Instance-based Reinforcement Learning Method and Its Applications to Control and Artificial Life Researches. (*in Japanese*)

Advisor: Prof. Shigenobu Kobayashi

### **Master of Engineering** 1980, Department of System Sciences, Tokyo Institute of Technology

Master Thesis: Extension of Extended-LINGOL to N-ary Tree. (*in Japanese*)

Advisor: Prof. Atsunobu Ichikawa and Dr. Hozumi Tanaka

### **Bachelor of Engineering** 1978, Department of Control Engineering, Tokyo Institute of Technology

Undergraduate Thesis: A Model of Roamer with Self-learning Function. (*in Japanese*)

Advisor: Prof. Atsunobu Ichikawa

## **Professional Activities**

**Committee member of Information Network Center of Soka University** Chairman 2014–2015.

### **Committee member of Information Center of Soka University**

Chairman 2004–2013.

Vice-chairman 2002–2004.

### **Chief of Industrial Application Council** Society for Instrument and Control Engineers, 2003.

The Council includes four divisions, Fluid Instrument and Control, Instrumentation Technologies, Industrial Systems, and Network Technologies for Instrument and Control.

**Steering committee member of Society for Instrument and Control Engineers** Chairman of the councils' conference. 2001–2002.

**Visiting Professor** AI Laboratory, Institute for Informatics, University of Zurich, April – September, 2000.

### **Administrator of Computers and Network**

Computer Center of Faculty of Engineering, Soka University 1994–2002

Information Processing Centre, Nagaoka University of Technology, 1987–1992

**Programming Consultant** Information Processing Center at Nagatsuda Campus, Tokyo Institute of Technology, 1990–1992

### **Chief of System and Information Council** Society for Instrument and Control Engineers, 1997–2000

The Society includes five councils and the Council includes seven divisions, System Engineering, Human Interface, Intelligent Engineering, Neural Networks, Bio-Engineering, Decentralized Autonomous Systems, and Discrete Events Systems.

**Chief of Intelligent Engineering Division** Society for Instrument and Control Engineers, 1995–1997

### **Working Group Member of Institute for New Generation Computer Technology**

Distributed and Cooperative Problem Solving WG, 1987–1988

Foundations of Artificial Intelligence WG, 1986–1990

Application System WG1-2, 1986–1987

Consultation System WG, 1982–1986

**Research Committee Member of Japanese Society for Mechanical Engineers**

RC-223 Co-Creative Industrial Processes in Knowledge Economical Society, 2005-2007  
RC-211 Highly Skilled System Technologies for Manufacturing utilizing Human Aspects, 2003-2005  
RC-194 Application of Information Technologies for Intelligent Industrial Processes in the Globalized Society, 2001-2003  
RC-175 Intelligent System Technologies for Human/Society Environmental Symbiosis in Distributed Artifacts System, 1999-2001  
RC-155 Intelligent System Technologies for Human-Machine Cooperative Plant in Uncertain Environment, 1997-1999  
RC-139 Intelligent Human-Machine Systems, 1995-1997  
RC-123 Development of Human Friendly Systems by Amalgamation of Intelligent Technologies, 1993-1995  
RC-106 Intelligent System Integration Technology for Plant Engineering, 1991-1993

**Editorial Board Member Of:**

GASATHJ, Generative Art, Science and Technology Hard Journal, 2012-  
Keisoku to Seigyo (Communications for Society of Instrument and Control), 2004-2005  
Journal of Information Processing Society in Japan, 1999-2001  
Journal of Advanced Computational Intelligence, 1996-Present  
Journal of Japanese Society for Artificial Intelligence, 1997-1998

**Program Committee Member Of:**

The 2018 Conference On Artificial Life (ALIFE 2018)  
14th European Conference of Artificial Life (ECAL 2017)  
8th International Conference on Computational Creativity (ICCC 2017)  
7th International Conference on Computational Creativity (ICCC 2016)  
15th International Conference on the Synthesis and Simulation of Living System (A-Life XV, 2016)  
13th European Conference of Artificial Life (ECAL 2015)  
6th International Conference on Computational Creativity (ICCC 2015)  
Virtual World 2012  
IEEE Symposium on Artificial Life (IEEE ALIFE 2011)  
7th European Evolutionary Computing Workshops (EvoMUSART, 2004)  
6th European Evolutionary Computing Workshops, (EvoMUSART, 2003)  
International Conference on Intelligent Robots and Systems (IROS, 1996)  
International Workshop on the Synthesis and Simulation of Living System (A-Life V, 1996)

**Reviewed Journal Submissions For:**

Artificial Life and Robotics  
Computer Software (published by Japanese Society of Software Sciences)  
IEEE Transactions on Evolutionary Computation  
IEEE Transactions on Knowledge and Data Engineering  
IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences  
Journal of Information Processing Society in Japan  
Journal of Japanese Society for Artificial Intelligence  
Journal of Japanese Society for Mechanical Engineers  
Journal of Society for Instrument and Control Engineers  
Journal of Advanced Computational Intelligence  
Machine Learning

**Reviewed Conference Submissions For:**

International Workshop on the Synthesis and Simulation of Living System (A-Life XIV, 2014)  
IEEE Symposium on Artificial Life (IEEE ALIFE 2011)  
International Conference on Knowledge-based Intelligent Information Engineering Systems (KES, 1999)  
International Conference on Intelligent Robots and Systems (IROS, 1996)  
International Workshop on the Synthesis and Simulation of Living System (A-Life V, 1996)  
Pacific Rim International Conference on Artificial Intelligence (PRICAI, 1990)  
International Conference on Fifth Generation Computer Systems (FGCS, 1988)

## Public Domain Software Development

**ZugVoegel** 2009-Present, Soka University and University of Zurich. Flocking birds simulator originally developed for a theater effect for contemporary ballet *Zugvögel*, that runs on MacOS X.

**DT4 Identity SA** 2007-Present, Soka University and University of Zurich. Generative and interactive artwork running on MacOS X with live camera.

**DT1 Flocking Orchestra** 2004-Present, Soka University and University of Zurich. Generative and interactive artwork running on MacOS X with live camera.

**VideoSummary** 2002-Present, Cubit Co., (shareware). Video utility that summarize a movie file into a collection of extracted frame images running on MacOS X.

A revised version *Video Summary 2* was released in 2014, available from App Store.

**SBEAT** 2001–2003, Soka University

A composition support tool to create short musical phrases and rhythms based on artificial selection. This is an application of Simulated Breeding, a type of Interactive Evolutionary Computing Technique. This software runs on MacOS 9 and X, and has been widely distributed through the world wide web.

**Sample Programs for Complex Systems and Artificial Life** 1998, Soka University

Collection of sample programs written in C language that work on Unix with X Window System. The collection includes Logistic map, Langton's self replicator, TSP solver by Genetic Algorithm, a simplified version of BOID and Tierra, and so on.

**SBART** 1994–Present, Soka University

A support tool to draw 2D CG images and movies using Simulated Breeding method. The first version works on Unix with X Window System including Linux, FreeBSD, SunOS, Solaris, HP-UX and IRIX. The version 2 runs on MacOS 7.6, 8, and 9. The third version runs on MacOS X PowerPC. The fourth version runs on MacOS X Intel CPU. The source code of all of versions are written in C language and Motif for Unix, Toolbox for MacOS 9, and Objective-C on Cocoa framework for MacOS X. This software has been widely distributed through the world wide web.

**TEW on PC-9801** 1983, Tokyo Institute of Technology

A terminal emulation software with window system working on the MS-DOS-based personal computer, NEC PC-9801 series, which was written in the assembly language.

**Co-PS** 1982, Tokyo Institute of Technology

An interpreter of concurrent production system designed for building expert systems written in LISP 1.9.

**LISP 1.9 on MELCOM COSMO** 1981, Tokyo Institute of Technology

An interpreter and compiler of a type of LISP programming language, written in the assembly language for Mitsubishi MELCOM-COSMO series super-mini computer system. This system was installed more than ten machines in universities and laboratories including Educational Computer Center in Tokyo University, Computer Center of Kyushu Institute of Design, and KDD Research Laboratory.

**N-ary Extended LINGOL** 1980, Electrotechnical Laboratory, MITI

A parser for Japanese language text written in LISP 2.0 on Toshiba TOSBAC-5600.

## Awards

- [1] Unemi, T. and Bisig, D. (2018) Rapid Biography in a Society of Evolutionary Lovers, *Excellence Award in Art Division, 21st Japan Media Arts Festival*, Agency for Cultural Affairs, Japan.
- [2] Unemi, T. and Matsumoto, H. (2018) LoversFlow v2 : an individual-based evo-eco simulator on sexual dimorphism – a challenge toward evolutionary aesthetics, *Best Paper Award*, the 23rd International Symposium on Artificial Life and Robotics, Beppu, Japan.
- [3] Unemi, T. and Bisig, D. (2016) Visual Liquidizer or Virtual Merge, *Best Artwork Award*, Arts Program in the 15th International Conference on the Synthesis and Simulation of Living Systems (ALIFE XV), Cancun, Mexico.

- [4] Bisig, D. and Unemi, T. (2011) Cycles, *Audience Prize*, Media Art Biennale WRO 2011 Alternative Now, WRO Center, Wrocław, Poland.
- [5] Bisig, D. and Unemi, T. (2007) MediaFlies, *Excellence Award in Art Division*, 10th Japan Media Arts Festival, Agency for Cultural Affairs, Japan.
- [6] Unemi, T. and Bisig, D. (2006) Flocking Messengers, *Honorary Mention*, VIDA 9.0 Concurso Internacional sobre Arte y Vida Artificial, Fundación Telefónica, Spain.
- [7] Unemi, T. (2001) For the First Graduation in 21st Century. (CG poster), *The Winner of the Competition on Evolutionary Art and Design*, in IEEE Congress on Evolutionary Computation, Seoul, Korea.

## Invited talks

- [8] Unemi, T (2015) Creativity in Evolutionary Arts, *Plenary Lecture in IEEE Congress on Evolutionary Computation 2015*, Sendai, Japan, May 28.
- [9] Unemi, T (2012) A Fully Automated Evolutionary Art, *Special Lecture in SCIS-ISIS 2012*, Kobe, Japan, November 22.

## Exhibitions

- [10] Unemi, T. and Bisig, D. (2018) 2D Generative Faces for Evolutionary Social Simulation, *the 21st Generative Art Conference*, Museo di Storia Naturale, Verona, Italy, December 18–20.
- [11] Unemi, T. and Bisig, D. (2018) Biografía rápida en una sociedad de amantes evolutivos, *Lenguaje, objetos y bestias*, Japan media arts festival en el Salón del Manga de Barcelona 2018, Fira de Barcelona, Spain, November 1–4.
- [12] Unemi, T. and Bisig, D. (2018) Browsing the Biographies in an Evolutionary Artificial Society, *the 6th Conference on Computation, Communication, Aesthetics & X*, C Arte C Museo Del Traje, Madrid, Spain, July 11–13.
- [13] Unemi, T. and Bisig, D. (2018) Rapid biography in a society of evolutionary lovers, *the 21st Japan Media Art Festival*, National Art Center, Tokyo, Japan, June 13–24.
- [14] Unemi, T. and Bisig, D. (2017) —, *the 20th Generative Art Conference*, Biblioteca Classense, Ravenna, Italy, December 13–15.
- [15] Unemi, T. (2017–18) Selections #1 by the computer from the collection of computer-created evolutionary abstract movies, *Artificial Intelligence Art and Aesthetics Exhibition*, Okinawa Institute of Science and Technology Graduate University (OIST), On’na-son, Okinawa, Japan, November 3– January 8.
- [16] Unemi, T. (2016) Selections by the computer from the five years’ stock of Daily Evolved Animations, *the 19th Generative Art Conference*, Auditorium of CRF Foundation, Florence, Italy, December 15–17.
- [17] — (2016) —, *NICOGRAPH 2016*, Toyama University, Toyama, Japan, November 4.
- [18] Unemi, T. (2016) Daily Evolved Animations, Arts Program in the 15th International Conference on the Synthesis and Simulation of the Living Systems (ALIFE XV), Cancun International Convention Center, Mexico, July 4-8.
- [19] Unemi, T. and Bisig, D. (2016) Visual Liquidizer or Virtual Merge, New Media Art Installation, —.
- [20] — (2015) *Demo session in ISEA 2015*, Simon Fraser University, Vancouver, BC, Canada, August 16.
- [21] — *Interactivity Exhibition*, in *ACM CHI 2015*, COEX, Seoul, Korea, April 20–23.
- [22] Unemi, T. (2015) Non-Stop Evolutionary Art You are Embedded in, New Media Art Installation, *Techfest 2015*, Indian Institute of Technology, Bombay, Mumbai, India, January 2–4.
- [23] Unemi, T. and Bisig, D. (2014) Visual Liquidizer or Virtual Merge #1, New Media Art Installation, *the 17th Generative Art Conference*, Biblioteca Angelica Gallery, Rome, Italy, December 17–19.
- [24] Unemi, T. (2013) Non-Stop Evolutionary Art You are Embedded in, New Media Art Installation, *the 16th Generative Art Conference*, La Triennale di Milano, Milan, Italy, December 9–12.

- [25] Bisig, D. and Unemi, T. (2011) *Cycles*, *Media Art Biennale WRO 2011 Alternative Now*, Pasaż Pokochof, Wrocław, Poland, May 10 – June 19.
- [26] — (2010) —, *lab 30 Augsburger Kunstlabor*, Kulturhaus Abraxas, Augsburg, Germany, November 4–6.
- [27] — (2010) —, *ISEA Ruhr 2010 Exhibition*, Museum für Kunst und Kulturgeschichte Dortmund, Germany, August 20 – September 5.
- [28] Unemi, T. and Bisig, D. (2007) *Identity SA*, *The Tenth Generative Art Conference*, Politecnico di Milano University, Milan, Italy, December 12–14.
- [29] Unemi, T. and Bisig, D. (2007) *Flocking Orchestra*, *Velocity Festival of Digital Culture*, Lanternhouse, Ulverston, UK, October 11 – November 3.
- [30] Bisig, D. and Unemi, T. (2007) *MediaFlies*, *ArtEscapes*, Universidad Politécnica de Valencia, Valencia, Spain, April 11 – May 18.
- [31] Unemi, T. and Bisig, D. (2007) *Flocking Messengers*, —.
- [32] Unemi, T. and Bisig, D. (2007) *Flocking Messengers*, *Telefónica booth in ARCO 2007*, IFEMA, Madrid, Spain, February 14–19.
- [33] Bisig, D. and Unemi, T. (2007) *MediaFlies*, *Japan Media Art Festival*, Tokyo Metropolitan Museum of Photography, Tokyo, Japan, February 24 – March 4.
- [34] Unemi, T. and Bisig, D. (2006) *Flocking Messengers*, *The Ninth Generative Art Conference*, Politecnico di Milano University, Milan, Italy, December 13–15.
- [35] Bisig, D. and Unemi, T. (2006) *MediaFlies*, —.
- [36] Unemi, T. and Bisig, D. (2006) *Flocking Orchestra*, *Leonardo II Art Show*, in International Conference on Advances in Computer Entertainment, Bel Age Hotel, West Hollywood, CA, USA, June 14–16.
- [37] Bisig, D. and Unemi, T. (2006) *MediaFlies*, —.
- [38] Unemi, T. and Bisig, D. (2005) *Flocking Orchestra*, *The Eighth Generative Art Conference*, Politecnico di Milano University, Milan, Italy, December 15–17.
- [39] Unemi, T. (2000) *Works at Gerhardstrasse 5 in a rainy day of May* (Computer-generated film), *Pitture Digitali*, Museo Civico di piazza del Santo, Padua, Italy, July 7 – August 27.
- [40] Unemi, T. (1993) *Evolution of a Simple Growth System in 2-D Euclidean Space*, *A-Life World*, Tokyo International Art Museum, T-Brain Club, June 23 – August 30.

## Live performances and demonstrations

- [41] Unemi, T. (2016) *SBArt4 breeding on site as VJ*, *Algorave – Algorithmic Horizon*, Org. R. Bell, Forestlimit, Tokyo, May 27, Spazio Rita, Nagoya, May 28.
- [42] Unemi, T. (2013) *A Fully Automatic Evolutionary Art*, *4th International Conference on Computational Creativity*, the University of Sydney, Sydney, NSW, Australia, June 14.
- [43] Unemi, T. (2011) *SBArt4 breeding on site*, *14th Generative Art Conference*, Instituto Cervantes di Roma, Piazza Navona, Rome, Italy, December 7.
- [44] Unemi, T. and Bisig, D. (2009) *Identity SA*, *SIGGRAPH 2009 Computer Animation Festival*, *Real-Time Rendering Live demonstration*, Ernest N. Morial Convention Center, New Orleans, LA, USA, August 3–6.
- [45] Unemi, T. (2008) *Project 7<sup>2</sup> – a swarm-based interactive art*, Demo Party in NTT-ICC, Tokyo, January 20.

## Collaborations

- [46] Unemi, T. and Bisig, D. (2009) Computer-based projection for a stage effect, *Mémoires d'Oubliettes*, Contemporary Ballet, Choreographed by Jiří Kylián, Netherlands Dance Theatre I, World-premiered in Lucent Dance Theatre, The Hague, Netherlands.
- [47] Unemi, T. and Bisig, D. (2009) Computer-based projection for a theater effect, *Zugvögel*, Contemporary Ballet, Choreographed by Jiří Kylián, Bavarian State Ballet, World-premiered in Bavarian State Opera, Munich, Germany.
- [48] Unemi, T. and Bisig, D. (2008) Computer-based projection for a stage effect, *Gods and Dogs*, Contemporary Ballet, Choreographed by Jiří Kylián, Netherlands Dance Theatre II, World-premiered in Lucent Dance Theatre, The Hague, Netherlands.
- [49] Unemi, T. and Bisig, D. (2008) Computer-based projection for a stage effect, *Vanishing Twin – Unfinished Works*, Contemporary Ballet, Choreographed by Jiří Kylián, Netherlands Dance Theatre I, —.

## Publications

### Doctor's Thesis

- [50] Unemi, T. (1994) An Instance-based Reinforcement Learning Method and Its Applications to Control and Artificial Life Researches (in Japanese). Tokyo Institute of Technology.

### Journal Publications

- [51] Sasaki, T., Unemi, T. (2011) Replicator dynamics in public goods games with reward funds, *Journal of Theoretical Biology*, Vol. 287, pp. 109–114.
- [52] Minoya, K., Unemi, T., Suzuki, R., Arita, T. (2011) A Constructive Approach to the Evolution of the Planning Ability, *International Journal of Artificial Life Research*, Vol. 2, No. 3, pp. 22–35.
- [53] Sasaki, T., Okada, I., Unemi, T. (2007) Probabilistic participation in public goods games, *Proceedings of the Royal Society – Biological Sciences*, Vol. 274, No. 1625, pp. 2639–2642.
- [54] Unemi, T. (2003) Simulated Breeding – a Framework of Breeding Artifacts on the Computer, *Kybernetes*, Vol. 32, No. 1/2, pp. 203–220.
- [55] Unemi, T. (2002) SBART 2.4: an IEC Tool for Creating 2D Images, Movies, and Collage, *Leonardo*, Vol. 35, No. 2, pp. 171, 189–191, MIT Press.
- [56] Unemi, T. (1999) A Simple Evolvable Development System in Euclidean Space, *Lectures on Mathematics in the Life Science*, American Mathematical Society, Vol. 26, pp. 103–110.
- [57] Unemi, T. (1992) An Instance-based Reinforcement Learning Method for Control not to Fail, *Journal of Japanese Society for Artificial Intelligence*, Vol. 7, No. 6, pp. 1001–1008 (in Japanese)
- [58] Unemi, T. (1992) An Instance-based Reinforcement Learning Method, *Journal of Japanese Society for Artificial Intelligence*, Vol. 7, No. 4, pp. 697–707 (in Japanese)

### Co-authoring Books

- [59] Ueda, K. *et al* (1995) *Methods in Artificial Life*, Kougyou-chousa-kai (in Japanese)
- [60] Kobayashi, S. *et al* (1990) *Intelligent Systems Handbook*, Ohm-sha (in Japanese)

### Book Chapters

- [61] Simulated Breeding — a Framework of Breeding Artifacts on the Computer, in A. Adamazky and M. Komosinski eds. (2005) *Artificial Life Models In Software*, and 2nd edition (2009), Springer.
- [62] Artificial Life, in K. Hirota *et al* (1996) *Introduction to Intelligent Engineering*, Shōkōdō (in Japanese)

- [63] Phenomena of Life in the Computer – Artificial Life, in H. Takagi, *et al* (1995) *Human and Society in the Multi-media Age*, Nikka-giren Shuppan (in Japanese)
- [64] Development and Ecological Systems on Two Dimensional Euclidean Space, in I. Aizu, O. Sakura, K. Wada, T. Ikegami, T. Hoshino, H. de Garis, H. Kitano, Y. Kawaguchi, T. Unemi, and H. Iwata (1994) *Artificial Life – Crossing among Information, Life and CG*, Kyouritsu Shuppan (in Japanese)
- [65] The World of Art that A-Life Creates, in T. Shibata, *et al* (1994) *Near Future of Artificial Life – The Technology to Create a New Life*, Jiji-tsūshin-sha (in Japanese)
- [66] Design of User Interface (1) Multi-window systems, in F. Mizoguchi, *et al* (1987) *Science of Interface*, Kyouritsu Shuppan, pp. 111–130 (in Japanese)
- [67] Introduction to Prolog, in H. Yoshino (ed) (1986) *Foundation of Law Expert Systems*, Gyousei, pp. 228–251 (in Japanese)
- [68] Applications to Natural Language Processing, in F. Mizoguchi, M. Takeda, T. Unemi, and R. Mizoguchi (1985) *Prolog and the applications 2*, Souken Shuppan, pp. 185–246 (in Japanese)

### Handbook/Encyclopedia Items

- [69] Search and Problem Solving, in R. Suzuki *et al* (1994) *Fuzzy, Neuro, and AI Systems Handbook*, Ohm-sha (in Japanese)
- [70] AI Programming, in K. Hirose *et al* (1990) *Encyclopedia of Computer Software*, Maruzen (in Japanese)
- [71] Learning System, in S. Ura *et al* (1989) *Information Systems Handbook*, Baifu-kan (in Japanese)

### Translations

- [72] Modification of Rules, in Ichikawa, S. *et al* (1991) *Induction – Toward an Integrated Theory of Inference, Learning, and Discovery*, Shin-yō-sha, pp. 81–118. (Holland, J. H. *et al* (1986) *Induction*.)
- [73] Shift of Bias for Inductive Concept Learning, in Asoh, H. *et al* (1988) *Learning Concepts and Rules*, Kyouritsu Shuppan, pp. 71–117. (Michalski, R. S. *et al* eds. (1986) *Machine Learning: An Artificial Intelligence Approach, Vol. II*.)

### Refereed Conference Papers

- [74] Unemi, T. and Bisig, D. (2018) 2D Generative Faces for Evolutionary Social Simulation, *the 21st Generative Art Conference*, December 18–20, Verona, Italy, pp. 415–422.
- [75] Unemi, T. and Matsumoto, H. (2018) LoversFlow v2 : an individual-based evo-eco simulator on sexual dimorphism – a challenge toward evolutionary aesthetics, *the 23rd International Symposium on Artificial Life and Robotics*, January 18–20, Beppu, Japan, pp. 295–300.
- [76] Broni-Bedaiko, C., Apietu Katsriku, F., Unemi, T., Shinomiya, N., Abdulai, J.-D., and Atsumi, M. (2018) El niño-southern oscillation forecasting using complex networks analysis of LSTM neural networks, —, pp. 100–105.
- [77] Unemi, T. and Bisig, D. (2017) Rapid biography in a society of evolutionary lovers, *the 20th Generative Art Conference*, December 13–15, Ravenna, Italy, pp. 432–441.
- [78] Unemi, T. (2016) Selections by the computer from the five years' stock of Daily Evolved Animations, *the 19th Generative Art Conference*, December 15–17, Florence, Italy, pp. 469–475.
- [79] Tagawa, S. and Unemi, T. (2016) System Development toward Human-Computer Co-Drawing Study on Computer Behavior, November 4–6, Toyama, Japan, pp. 196–203. (in Japanese).
- [80] Unemi, T. (2016) Automated Evolutionary Production of Audio-Visual Pieces – Can we call it Art? *Proc. of the 21st International Symposium on Artificial Life and Robotics*, p. 308, January 20–22, in Beppu, Japan.



- [81] Unemi, T. and Bisig, D. (2015) Visual Liquidizer or Virtual Merge, *Art.CHI, a workshop in ACM CHI 2015*, April 18–19, in Seoul, Korea.
- [82] Unemi, T. (2014) Automated Daily Production of Evolutionary Audio Visual Art – An Experimental Practice, *Proceedings of the Fifth International Conference on Computational Creativity*, June 9–13, Ljubljana, Slovenia, Session 2-2.
- [83] Unemi, T. and Bisig, D. (2014) Visual Deformation by Swarm – a Technique for Virtual Liquidizer of Objects, *Proceedings of the 17th Generative Art Conference*, December 17–19, Rome, Italy, pp. 347–356.
- [84] Unemi, T. and Bisig, D. (2014) Visual Liquidizer or Virtual Merge #1. —, pp. 376–381.
- [85] Tagawa, S. and Unemi, T. (2014) On Effects of Cooperation with the Machine in Human- Computer Co-Drawing, —, pp. 306–315.
- [86] Unemi, T. (2013) Non-stop Evolutionary Art You are Embedded in, *Proceedings of the 16th Generative Art Conference*, December 10-12, Milan, Italy, pp. 247–253.
- [87] Unemi, T. (2012) Synthesis of sound effects for generative animation, *Proceedings of the 15th Generative Art Conference*, Lucca, Italy, pp. 364–376.
- [88] Unemi, T. (2012) SBArt4 for an Automatic Evolutionary Art, *Proceedings of the IEEE World Congress on Computational Intelligence (WCCI 2012 – IEEE CEC 2012)*, June 10–15, Brisbane, QLD, Australia, pp. 2014–2021.
- [89] Unemi, T. (2011) SBArt4 as Automatic Art and Live Performance Tool, *Proceedings of the 14th Generative Art Conference*, Rome, Italy, pp. 436–447.
- [90] Bisig, D. and Unemi, T. (2011) From Shared Presence to Hybrid Identity, in Ascott, R. and Girão, L. M. eds. *Consciousness Reframed 12*, Lisbon, Portugal, pp. 48–53.
- [91] Unemi, T. (2010) A Breeding Tool for Abstract Animations and Its Applications, *Proceedings of the 13th Generative Art Conference*, Milan, Italy, pp. 452–458.
- [92] Bisig, D. and Unemi, T. (2010) Cycles – Blending Natural and Artificial Properties in a Generative Artwork, *Proceedings of the 13th Generative Art Conference*, Milan, Italy, pp. 140–154.
- [93] Unemi, T. (2010) SBArt4 – Breeding Abstract Animations in Realtime, *Proceedings of the IEEE World Congress on Computational Intelligence (WCCI 2010 – IEEE CEC 2010)*, July 18–23, Barcelona, Spain, pp. 4004–4009.
- [94] Bisig, D. and Unemi, T. (2009) Swarms on Stage – Swarm Simulations for Dance Performance, *Proceedings of the 12th Generative Art Conference*, Milan, Italy, pp. 105–114.
- [95] Minoya, K., Unemi, T., Suzuki, R. and Arita, T. (2009) A Constructive Approach to the Evolution of the Planning Ability, *Proceedings of 13th Asia Pacific Symposium on Intelligent and Evolutionary Systems*, Fukuoka, Japan.
- [96] Unemi, T. and Bisig, D. (2008) A generative remixing of music tracks based on an interactive swarm, *Proceedings of the 11th Generative Art Conference*, Milan, Italy, pp. 388–392.
- [97] Unemi, T., Matsui, Y. and Bisig, D. (2008) Identity SA 1.6 – An artistic software that produces a deformed audio-visual reflection based on a visually interactive swarm, *Proceedings of the ACE 2008 International Conference on Advances in Computer Entertainment Technology*, Yokohama, Japan, pp. 297–300.
- [98] Unemi, T. and Bisig, D. (2007) Identity SA – an Interactive Swarm-based Animation with a Deformed Reflection, *Proceedings of the Tenth Generative Art Conference*, Milan, Italy, pp. 269–279.
- [99] Bisig, D. and Unemi, T. (2006) MediaFlies – An Interactive Flocking Based Tool for the Remixing of Media, *Proceedings of the 19th International FLAIRS Conference*, Melbourne, FL, USA.
- [100] Bisig, D. and Unemi, T. (2006) MediaFlies – A Video and Audio Remixing Multi Agent System, *Proceedings of the Ninth Generative Art Conference*, Milan, Italy, pp. 63–74.
- [101] Unemi, T. and Bisig, D. (2006) Flocking Messengers, —, pp. 272–280.

- [102] Unemi, T. and Bisig, D. (2005) Music by Interaction among Two Flocking Species and Human. *Proceedings of the Third International Conference on Generative Systems in Electronic Arts*, Melbourne, Australia, CEMA, Monash Univ., pp. 171–179.
- [103] Unemi, T. and Bisig, D. (2005) Flocking Orchestra – to play a type of generative music by interaction between human and flocking agents, *Proceedings of the Eighth Generative Art Conference*, Milan, Italy, pp. 19–21.
- [104] Unemi, T. and Bisig, D. (2004) Playing Music by Conducting BOID Agents - A Style of Interaction in the Life with A-Life, *Proceedings of the Ninth International Conference on the Simulation and Synthesis of Living Systems (ALIFE9)*, Boston, MA, USA, MIT Press., pp. 546–550.
- [105] Unemi, T. (2004) Embedding Movie into SBART – Breeding deformed movies, *Proceedings of the IEEE International Conference on Systems, Man and Cybernetics*, Den Haag, Netherlands, pp. 5760–5764.
- [106] Unemi, T. and Soda, M. (2003) An IEC-based Support System for Font Design, *Proceedings of the 2003 IEEE International Conference on Systems Man and Cybernetics*, Arlington, VA, USA, pp. 968–973.
- [107] Unemi, T., Kaneko, Y., and Takahashi, I. (2003) War and Peace among Artificial Nations - a model and simulation based on a two-layered multi-agent system, *Advances in Artificial Life - 7th European Conference (ECAL 2003)*, Dortmund, Germany, Springer Verlag, pp. 146–153.
- [108] Unemi, T. (2002) A tool for multi-part music composition by simulated breeding, *Proceedings of the Eighth International Conference on Artificial Life (A-Life VIII)*, Sydney, Australia, pp. 410–413.
- [109] Unemi, T. (2002) Partial breeding — a method of IEC for well-structured large scale target domains, *Proceedings of the 2002 IEEE International Conference on Systems Man and Cybernetics*, Hammamet, Tunisia, CD-ROM, TP1D4.
- [110] Unemi, T. and Senda, M. (2001) A New Musical Tool for Composition and Play Based on Simulated Breeding, *The Second International Conference on Generative Systems in the Electronic Arts*, pp. 100–109, Melbourne, Australia.
- [111] Unemi, T. and Nakada, E. (2001) A Tool for Composing Short Music Pieces by Means of Breeding, *Proceedings of the 2001 IEEE International Conference on Systems, Man and Cybernetics*, Tucson, AZ, USA, pp. 3458–3463.
- [112] Unemi, T. (2000) Scaling up reinforcement learning with human Knowledge as an intrinsic behavior, *Proceedings of the Sixth International Conference on Intelligent Autonomous Systems (IAS-6)*, pp. 511–518, Venice, Italy, IOS Press.
- [113] Unemi, T. (2000) Should seeds fly or not? *Proceedings of the Seventh International Conference on Artificial Life (A-Life VII)*, pp. 253–259, Portland, OR, USA, MIT Press.
- [114] Unemi, T. and Saitoh, H. (1999) Episode-based Reinforcement Learning – an instance-based approach for perceptual aliasing, *Proceedings of the 1999 IEEE International Conference on Systems, Man and Cybernetics*, pp. V-435–440, Tokyo, Japan.
- [115] Unemi, T. (1999) SBART 2.4: Breeding 2D CG Images and Movies and Creating a Type of Collage, *Proceedings of the Third International Conference on Knowledge-based Intelligent Information Engineering Systems*, pp. 288–291, Adelaide, SA, Australia.
- [116] Unemi, T. and Koike, T. (1998) Evolution of a Botanical Development System in 3D Euclidean Space, *Proceedings of A-Life VI*, MIT Press. pp. 467–471, Los Angeles, CA, USA.
- [117] Unemi, T. (1998) A Design of Multi-Field User Interface for Simulated Breeding, *Proceedings of the third Asian Fuzzy Systems Symposium*, Korean Fuzzy Logic and Intelligent Systems Society, pp. 489–494, Masan, Korea.
- [118] Inagaki, Y. and Unemi, T. (1995) The Human-robot Cooperating System Using Behavior-based Intention Inference, *Proceedings of the International Joint Conference of CFSA/IFIS/SOFT'95 on Fuzzy Theory and Applications*, pp. 549–554, Taipei, China.
- [119] Sugie, H., Inagaki, Y., Ono, S., Aisu, H., and Unemi, T. (1995) Placing Objects with Multiple Mobile Robots – Mutual Help Using Intention Inference, *Proceedings of the IEEE International Conference on Robotics and Automation*, pp. 2181–2186, Nagoya, Japan.

- [120] Unemi, T., Inagaki, Y., Ono, S., Aisu, H., and Sugie, H. (1995) On the Relation between Human and Robots in the future – a perspective from Fuzzy Engineering and Artificial Life, *Proceedings of the International Joint Conference of the Fourth International Conference on Fuzzy Systems and the Second International Fuzzy Engineering Symposium*, pp. 1689–1694, Yokohama, Japan.
- [121] Inagaki, Y., Ono, S., Aisu, H., Sugie, H., and Unemi, T. (1995) Behavior-based Intention Inference for Intelligent Robots Cooperating with Human, —, pp. 1695–1700.
- [122] Aisu, H., Inagaki, Y., Ono, S., Sugie, H., and Unemi, T. (1995) A Robust Planning and Control System Handling Fuzziness, —, pp. 1701–1704.
- [123] Sugie, H., Inagaki, Y., Ono, S., Aisu, H., and Unemi, T. (1995) Cooperation among Multiple Mobile Robots Using Intention Inference, —, pp. 1707–1712.
- [124] Ono, S., Inagaki, Y., Aisu, H., Sugie, H., and Unemi, T. (1995) Fast and Feasible Reinforcement Learning Algorithm, —, pp. 1713–1718.
- [125] Unemi, T., Nagayoshi, M., Hirayama, N., Nade, T., Yano, K., and Masujima, Y. (1994) Evolutionary Differentiation of Learning Abilities – a case study on optimizing parameter values in Q-learning by a genetic algorithm, *Proceedings of the Forth International Workshop on the Synthesis and Simulation of Living Systems*, pp. 331–336, Cambridge, MA, USA.
- [126] Sugie, H., Inagaki, Y., Ono, S., Y., Aisu, and Unemi, T. (1994) Pushing an Object by Cooperative Mobile Robots, *Proceedings of the Third International Workshop on Advanced Motion Control*, Berkeley, CA, USA.
- [127] Inagaki, Y., Aisu, H., Sugie, H., and Unemi, T. (1993) A Study of a Method for Intention Inference from Human’s Behavior, *Proceedings of the IEEE International Workshop on Robot and Human Communication*, Tokyo, Japan.
- [128] Aisu, H., Sugie, H., Inagaki, Y., and Unemi, T. (1993) A Planning Architecture for Intelligent Robot: Fuzzy Memory-Based Reasoning for Real-time Planning/Control, *Proceedings of the International Conference on Industrial Electronics, Control and Instrumentation*, Lahaina, HI, USA.
- [129] Unemi, T. (1993) Collective Behavior of Reinforcement Learning Agents, *Proceedings of the 1993 IEEE/Nagoya University World Wise men/women Workshop on Learning and Adaptive System*, pp. 92–97, Nagoya, Japan.
- [130] Unemi, T. (1990) On Inductive Learning of Three Kinds of Data Structures, *Proceedings of the First International Workshop on Algorithmic Learning Theory*, pp. 120–133, Tokyo, Japan.

### Journal Articles

- [131] Unemi, T. (2018) A Challenge on Automated Generation of Abstract Images by Computational Aesthetics Measures, *Journal of Japanese Society for Artificial Intelligence*, Vol. 33, No. 6, pp. 727–734 (in Japanese).
- [132] Unemi, T. (2010) Interactive Media using Artificial Life, *Science Forum*, Tokyo Science University, pp. 15–20 (in Japanese)
- [133] Unemi, T. (2005) Applications of Simulated Breeding to CG and Music, and their User Interface Design, *Journal of the Society of Instrument and Control Engineers*, Vol. 44, No. 1, pp. 58–63 (in Japanese)
- [134] Unemi, T., Inagaki, Y., Ono, S., Aisu, H., and Sugie, H. (1999) A Design of Autonomous Mobile Robot Team That Works Together with Human – The Case at Laboratory for International Fuzzy Engineering Research, *Journal of the Society of Instrument and Control Engineers*, Vol. 38, No. 6, pp. 385–389 (in Japanese).
- [135] Takagi, H., Unemi, T., and Terano, T. (1998) Perspective on Interactive Evolutionary Computing, *Journal of Japanese Society for Artificial Intelligence*, Vol. 13, No. 5, pp. 692–703 (in Japanese).
- [136] Unemi, T. (1997) Researches on Artificial Life from a View Point of Polyagent, *Operations Research*, Vol. 42, No. 9, pp. 604–609 (in Japanese).
- [137] Unemi, T. (1995) A Distributed Robot System That Works Cooperatively with Human, *Journal of Japanese Society for Fuzzy Theory and Systems*, Vol. 7, No. 4, pp. 747–752 (in Japanese).

- [138] Unemi, T. (1995) Reinforcement Learning Method and Its Applications to Robot, *Journal of the Robotics Society of Japan*, Vol. 13, No. 1, pp. 51–56 (in Japanese).
- [139] Unemi, T. (1994) Simulating Evolution of a Simple Development System, *Journal of the Japan Society for Simulation Technology*, Vol. 13, No. 4, pp. 311–316 (in Japanese).
- [140] Unemi, T. (1994) Simulated Breeding to Create CG Images, *Computer Today*, No. 64, pp. 76–82 (in Japanese).
- [141] Unemi, T. (1994) Reinforcement Learning Method, *Journal of Japanese Society for Artificial Intelligence*, Vol. 9, No. 6, pp. 830–836 (in Japanese).
- [142] Unemi, T. (1994) Genetic Algorithms and Computer Graphics Art, *Journal of Japanese Society for Artificial Intelligence*, Vol. 9, No. 4, pp. 518–523 (in Japanese)
- [143] Unemi, T. (1993) Applications of Genetic Algorithms for Control, *Journal of the Society of Instrument and Control Engineers*, Vol. 32, No. 1, pp. 58–62 (in Japanese)
- [144] Unemi, T. (1987) Where AI and Programming Meet, *Journal of Japanese Society for Artificial Intelligence* (in Japanese)
- [145] Unemi, T. (1985) Foundations and Applications of Intelligent Engineering 3 – Implementation of Knowledge-based System by Prolog, *Journal of the Society of Instrument and Control Engineers*, Vol. 24, No. 5, pp. 439–448 (in Japanese)
- [146] Unemi, T. (1982) Development of LISP1.9 on MELCOM-COSMO, *IPJS Magazine “Jouho Shori”* (in Japanese)

#### **Workshop & Technical Reports**

- [147] Unemi, T. and Bisig, D. (2018) Browsing the Biographies in an Evolutionary Artificial Society, *Proceedings of the 6th Conference on Computation, Communication, Aesthetics & X*, pp. 212–214, July 11–13, Madrid, Spain.
- [148] Unemi, T. (2018) On the Evolutionary Effects of Social Suppression of Sexual Orientation – by an Agent-based Simulation for Human Life As-It-Could-Be, *Late Breaking Abstract, ALIFE 2018*, July 23–27, Tokyo, Japan.
- [149] Unemi, T. (2017) Aesthetics, creativity, and the arts, for the computer by the computer — toward the evolutionary art theory, *the 1st Symposium in Artificial Intelligence, Art and Aesthetics Exhibition*, November 12, in On’na-son, Okinawa, Japan.
- [150] Nawata, S. and Unemi, T. (2017) Toward a design of human-computer co-drawing system: preliminary experiments on effects of imitation and interference, *New Generation Human-Agent Interaction Workshop, in the 5th International Conference on Human-Agent Interaction*, October 17, in Bielefeld, Germany.
- [151] Matsumoto, H. and Unemi, T. (2017) A study on evolutionary dynamics of mating: appearance and distance, *Late-Breaking Abstracts Booklet of the 14th European Conference on Artificial Life*, pp. 11–12, September 7, in Lyon, France.
- [152] Unemi, T. and Bisig, D. (2017) Toward the Evolutionary Robotics to seek the origin of love and beauty, *Symposium on Building Bodies for Brains & Brains for Bodies*, the Human Brain Project at Campus Biotech, June 16, in Geneva, Switzerland.
- [153] Sakae, Y. and Unemi, T. (2017) A study of a font creation support system for brush style square letters, *44th SICE Symposium on Intelligent Systems*, A1-4, March 13–14, Tokyo, (in Japanese).
- [154] Unemi, T. (2016) Evolutionary Arts and Computational Creativity for Arts, *Japanese Cognitive Science Society, SIG DCC*, June 25, Kanazawa, (in Japanese).
- [155] Kume, M. and Unemi, T. (2015) Coloring Support System by Impression Words and Interactive Evolutionary Computation, *42nd SICE Symposium on Intelligent Systems*, E-03, March 17–18, in Kobe, (in Japanese).
- [156] Oda, K. and Unemi, T. (2015) Support of Movie Editing by Automated Splitting of the Scenes with Optical Flow, —, H-02, (in Japanese).
- [157] Tagawa, S. and Unemi, T. (2014) Proposal of Human-Computer Co-Drawing System to Inspect the Interaction, *Human-Agent Interaction Symposium 2014*, P-14, pp. 104–109, December 13–14, in Gifu, (in Japanese).

- [158] Takahashi, H. and Unemi, T. (2014) Extraction and Evaluation of Featuring Factors on Difficulty of Piano Play, *SICE Symposium on Systems and Information 2014*, GS2-1, pp. 42–45, November 21–23, Okayama, (in Japanese).
- [159] Unemi, T. (2014) An experiment on fully automated production of abstract animations by evolutionary computing and computational aesthetic measures, *the 28th Annual Conference of the Japanese Society for Artificial Intelligence*, May 12–15, Matsuyama, Japan, 2D1-4in (in Japanese).
- [160] Unemi, T. (2014) A Daily Automated Evolutionary Production of Abstract Animations, *the 8th International Workshop on Natural Computing*, one page abstract, March 18–19, Hiroshima, Japan, p. 57.
- [161] Shutsu, S. and Unemi, T. (2013) A Design of User Interface for Web Search Using a Dynamic 3D Visualization, *NICOGRAPH 2013*, November 8–9, Koshu-shi, Yamanashi, Japan, pp. 195–196 (in Japanese).
- [162] Tagawa, S. and Unemi, T. (2013) Toward a Collaborative Work between Human and Computer on Drawing, —, pp. 169–170 (in Japanese).
- [163] Unemi, T. (2013) Breeding on Site, one page abstract for demonstration, *Proceedings of the 4th International Conference on Computational Creativity*, June 12–14, Sydney, Australia, p. 227.
- [164] Unemi, T. (2013) A Fully Automatic Evolutionary Art, —, p. 228.
- [165] Shibuya, J. and Unemi, T. (2013) A fast algorithm for simulation of flocking behaviour in 3D space, *Art and Science Forum 2013*, Yokohama, Japan. (in Japanese).
- [166] Oku, M. and Unemi, T. (2013) A Design of timber synthesis support system based on Kansei information, – (in Japanese).
- [167] Unemi, T. (2012) An automatic evolutionary art, Artist talk in *International Symposium on Electronic Arts*, September 22, Albuquerque, NM, USA.
- [168] Hara, T. and Unemi, T. (2012) A high-speed drawing method of the flock for video editing, *Art and Science Forum 2012*, Program Number 22, Nakano, Tokyo, Japan, (in Japanese).
- [169] Unemi, T. (2011) SBArt4 as Automatic Art and Live Performance Tool, *Evolutionary Computation Symposium*, pp. 44–47, Iwanuma, Miyagi, Japan, (in Japanese).
- [170] Unemi, T. (2011) Never Ending Evolutionary Movie – real-time production of abstract animations by an evolutionary computation based on a computational aesthetic measures, *27th NICOGRAPH Autumn*, pp. 49–56, Tokyo, (in Japanese).
- [171] Unemi, T. (2011) SBArt4 – Breeding and Evolving Abstract Images and Animations, Poster presentation in *International Symposium on Computational Aesthetics in Graphics, Visualization, and Imaging*, August 5-7, Vancouver, Canada.
- [172] Katoh, K. and Unemi, T. (2011) A study of efficient calculation by the optimal task allocation to computing devices, *The 38th Intelligent System Symposium*, Kobe, pp. 197–200 (in Japanese).
- [173] Abe, M. and Unemi, T. (2011) A study of seed dispersal on the simulation of environmental change by time, —, pp. 41–46 (in Japanese).
- [174] Unemi, T. (2011) Combining a simulated breeding for abstract animations and an evolutionary computing based on computational aesthetic measures, *The Sixth Workshop on Frontiers of Evolutionary Computation*, Japanese Society of Artificial Intelligence, Nagoya (in Japanese).
- [175] Tomimatsu, T. and Unemi, T. (2010) A Realtime Filter to Modify Real Images into a Style of Ink Painting, *26th NICOGRAPH Autumn*, Morioka, (in Japanese).
- [176] Unemi, T. (2010) SBArt4 – Real-time Breeding of Abstract Animations, *The Fourth Workshop on Frontiers of Evolutionary Computation*, Japanese Society of Artificial Intelligence, Okayama (in Japanese).
- [177] Koyama, S. and Unemi, T. (2009) A Model and Simulation on Territorial Conflicts with Landscape, *The 36th Intelligent System Symposium*, Kyoto, pp. 149–154 (in Japanese).
- [178] Minoya, K. and Unemi, T. (2009) A Fundamental Study on the Evolutionary Acquisition of Planning Abilities, —, pp. 79–84 (in Japanese).

- [179] Minoya, K. and Unemi, T. (2008) On the Origin of Planning, *The 14th Emergent System Symposium*, Toyama (in Japanese).
- [180] Sasaki, T., Okada, I., and Unemi, T. (2007) Evolution of Collaboration in Public Goods Games with Probabilistic Participation, *The Ninth Symposium of Human Behavior and Evolution Society Japan*.
- [181] Sasaki, T., Okada, I., and Unemi, T. (2007) Evolution of Cooperation in Public Goods Games with Probabilistic Participation, *The Fourth Symposium on Theory of Mathematical Biology and Its Applications*, Research Institute for Mathematical Sciences, Kyoto University (in Japanese).
- [182] Sasaki, T., Okada, I., and Unemi, T. (2007) Public Goods Games with Probabilistic Participation: Evolutionary Dynamics and Spatial Effects, *4th International Conference on Mathematical Biology*, Wuyishan, Fujian, China, Abstract: p. 123.
- [183] Unemi, T. and Bisig, D. (2007) Flocking Messengers – an online chat system via flocking agents, *the 34th Intelligent System Symposium*, Kyoto, pp. 291–296 (in Japanese).
- [184] Sasaki, T., Okada, I., and Unemi, T. (2007) An Analysis of Replicator Dynamics on Public Goods Games with Probabilistic Participation, —, pp. 143–148 (in Japanese).
- [185] Uemura, K. and Unemi, T. (2007) A Study of International Conflict by Multi-Agent Simulation, —, pp. 249–254 (in Japanese).
- [186] Tohyama, T. and Unemi, T. (2007) A Study to Use CG Techniques of Fluid Phenomena for Interactive Art, —, pp. 337–340 (in Japanese).
- [187] Yamamoto, K. and Unemi, T. (2006) Structure Evaluation of Demand Network using a Multi-Agent System, *The 18th Autonomous Distributed Systems Symposium*, Society of Instrument and Control Engineers, pp. 1–4 (in Japanese).
- [188] Kawakita, M. and Unemi, T. (2006) Interaction between Artificial Life and Real Life in Visual Level – Flocking Agents that Express Their Emotion, —, pp. 223–226 (in Japanese).
- [189] Unemi, T. and Bisig, D. (2005) Flocking Orchestra – a challenge toward music by interaction between flocking agents and viewers, *The Eleventh Emergent Systems Symposium*, Society of Instrument and Control Engineers, pp. 94–95 (in Japanese).
- [190] Sasaki, T. and Unemi, T. (2005) Stability of International System and Domestic Conflict, —, pp. 155–158 (in Japanese).
- [191] Ono, R. and Unemi, T. (2005) Escaping from Premature Convergence in Genetic Programming – Introduction of Sharing Function that Measures Distances between Tree-structured Genes, *The 32nd Intelligent Systems Symposium*, Society of Instrument and Control Engineers, pp. 211–216 (in Japanese).
- [192] Sasaki, T. and Unemi, T. (2005) Dynamics of International Borders Based on a Two-Layered Multi-Agent System, —, pp. 367–372 (in Japanese).
- [193] Takeda, F. and Unemi, T. (2004) A Study on Adaptive Traffic Signal Scheduling by Reinforcement Learning, *Annual Conference of System Integration Council*, Society of Instrument and Control Engineers, CD-ROM, 3G4-5 (in Japanese).
- [194] Unemi, T. and Bisig, D. (2004) Playing Music by Conducting Flocking Agents – a study on a connection between Artificial Life and Real Life, *NICOGRAPH Spring Symposium*, Tokyo (in Japanese).
- [195] Ono, R. and Unemi, T. (2003) Prediction of Horse Race by a Fuzzy Genetic Programming, *Annual Conference of System and Information Council*, Society of Instrument and Control Engineers, pp. 161–166 (in Japanese).
- [196] Unemi, T. and Mizuno, K. (2003) A Color Arrangement Support System utilizing Simulated Breeding, —, pp. 167–160 (in Japanese).
- [197] Unemi, T. and Mizuno, K. (2003) Exploring multiple colour spaces by an IEC technique, *Workshop on Interactive Evolutionary Search and Exploration Systems in GECCO-2003*, Chicago, IL, USA.

- [198] Kaneko, Y., Unemi, T., and Takahashi, I. (2003) A Study on Inter-organization Conflict based on a Poly-Agent System, *The 28th System Engineering Symposium*, Society of Instrument and Control Engineers, pp. 7–12 (in Japanese).
- [199] Unemi, T. (2002) A design of genetic encoding for breeding short musical pieces, *Workshop on Artificial Life Models for Musical Applications II*, Sydney, Australia, pp. 25–29.
- [200] Kaneko, Y., Unemi, T., Takahashi, I. (2002) Dynamics of Two-Layered Organization in Poly-Agent System, *Annual Conference of System and Information Council*, Society of Instrument and Control Engineers, Yokohama, pp. 213–218 (in Japanese).
- [201] Hamano, T., Unemi, T., Takahashi, I. (2002) A Study on Dilemma in Public Goods by a Multi-Agent-based Artificial Society Model, —, pp. 219–222 (in Japanese).
- [202] Senda, M. and Unemi, T. (2002) A Study of Composition Support System by Simulated Breeding – An Extension for Multiple Part, *40th Regular Meeting of Special Interest Group on Music and Computer*, Information Processing Society Japan, pp. 133–138 (in Japanese).
- [203] Tokuoka, K. and Unemi, T. (2002) Modeling an Autonomous Reinforcement System, *14th Autonomous Distributed Systems Symposium*, Society of Instrument and Control Engineers, pp. 283–286 (in Japanese).
- [204] Kasahara, N., Unemi, T., and Atsumi, M. (2001) A Study of Traffic Signal Scheduling by a Reinforcement Learning Method, *Annual Conference of System Integration Council*, Society of Instrument and Control Engineers (in Japanese).
- [205] Mizuno, N. and Unemi, T. (2001) Graphic Design Support for Title String by Simulated Breeding, *Annual Conference of System and Information Council*, Society of Instrument and Control Engineers, pp. 349–352 (in Japanese).
- [206] Unemi, T. (2001) Artistic Applications of Evolutionary Computation, *SIG-AI 2001-10*, The Institute of Electronics, Information and Communication Engineers, pp. 71–78.
- [207] Nakada, E. and Unemi, T. (2001) A Study of Music Composition Support System utilizing Simulated Breeding, *The 28th Intelligent Systems Symposium*, Society of Instrument and Control Engineers, pp. 141–146 (in Japanese).
- [208] Unemi, T. (2000) A method to embed human knowledge to reinforcement learning method, *Proceedings of the Second International Conference on Formal Methods and Intelligent Techniques in Control, Decision making, Multimedia and Robotics*, Warsaw, Poland, Polish-Japanese Institute of Information Technology, pp. 204–217.
- [209] Unemi, T. (2000) SBART 2.4: an IEC Tool for Creating 2D Images, Movies, and Collage, *Genetic and Evolutionary Computation Conference Workshop Program*, Las Vegas, NV, USA, pp. 21–23.
- [210] Unemi, T. (1999) Speciation by Migration, *SICE System and Information Symposium 1999*, pp. 261–266 (in Japanese).
- [211] Unemi, T. (1999) A Support System to Create Collage by Simulated Breeding Method, *The 11th Annual Conference of Japanese Association Simulation and Gaming*, pp. 110–113 (in Japanese).
- [212] Unemi, T. (1999) Reviewing A-Life Researches, *ALIREN + ALIST Joint Workshop*, (in Japanese).
- [213] Saitoh, H. and Unemi, T. (1999) An Approach to Hidden Markovian Problem by an Episode-based Reinforcement Learning Method (2), *the 26th Intelligent System Symposium, SICE*, pp. 115–120 (in Japanese).
- [214] Ookawa, T. and Unemi, T. (1999) A Genetic Algorithm with Speciation and its Application to Cooperative Problem Solving, *the 26th Intelligent System Symposium, SICE*, pp. 151–156 (in Japanese).
- [215] Ookawa, T. and Unemi, T. (1998) A Evolutionary Computing by a Local Mating with Geographical Environmental Change, *SICE System / Information Joint Symposium*, pp. 11–14 (in Japanese).
- [216] Saitoh, H. and Unemi, T. (1998) An Approach to Hidden Markovian Problem by an Episode-based Reinforcement Learning Method, *SICE System / Information Joint Symposium*, pp. 163–168 (in Japanese).
- [217] Unemi, T. (1998) A Study on Botanical Evolutionary Development System in 3D Euclidean Space (2), *SICE System / Information Joint Symposium*, pp. 175–180 (in Japanese).

- [218] Unemi, T. and Koike, T. (1998) Study on Botanical Evolutionary Development System in 3D Euclidean Space, *SICE the Forth Emergent System Symposium*, Poster.
- [219] Unemi, T. (1998) A User Interface for Simulated Breeding using Multi-field, *Workshop on Interactive Evolutionary Computing*, pp. 42–46 (in Japanese).
- [220] Koike, T. and Unemi, T. (1998) An Approach toward Morphological Diversity in an Evolutionary Development System, *Tenth SICE Symposium on Decentralized Autonomous Systems*, pp. 325–330 (in Japanese).
- [221] Saitoh, H., Ookawa, T., and Unemi, T. (1997) A Testbed to Evaluate Adaptive Methods to Acquiring Teamwork Strategies, *SICE System / Information Joint Symposium*, pp. 7–10 (in Japanese).
- [222] Ookawa, T., Saitoh, H., and Unemi, T. (1997) Evolutionary Acquisition of Cooperative Strategies by Local Mating – using NMFS, *SICE System / Information Joint Symposium*, pp. 11–14 (in Japanese).
- [223] Unemi, T. (1997) Local Mating Strategies for Self-evolvable Autonomous Mobile Robot Team, *SICE System / Information Joint Symposium*, pp. 77–82 (in Japanese).
- [224] Unemi, T. and Nagayoshi, M. (1997) Evolution of Learning Robot Team via Local Mating Strategy, *Fourth European Conference on Artificial Life*, Poster Session, Brighton UK, July 28-31.
- [225] Unemi, T. (1997) Toward On-Line Evolution for Distributed Robot System, *ICGA-97 Workshop On Evolutionary Robotics*, Michigan State Univ. July 22.
- [226] Unemi, T. and Nagayoshi, M. (1997) An Analysis of Species Differentiation on Evolutionary Robot Team, *Ninth SICE Symposium on Decentralized Autonomous Systems*, pp. 135–140 (in Japanese).
- [227] Unemi, T. and Nagayoshi, M. (1996) Evolution of Reinforcement Learning Agents – toward a feasible design of evolvable robot team, *ICMAS 96 Workshop on learning, interactions and organizations in multiagent environment*.
- [228] Nagayoshi, M. and Unemi, T. (1996) On a Design of Life Cycle for Evolutionary Robot Group, *SICE System / Information Joint Symposium*, pp. 87–92 (in Japanese).
- [229] Unemi, T. (1996) Evolution of Reinforcement Learning Agents, *the Second Emergent System Symposium*, pp. 42–47 (in Japanese).
- [230] Unemi, T. (1996) Emergent Learning and Evolution of Behavior, *SICE 35th Annual Conference* (in Japanese).
- [231] Unemi, T. (1996) IBQL: an Instance-based Q-Learning, *12th Fuzzy System Symposium*, pp. 887–890 (in Japanese).
- [232] Unemi, T. (1996) Human-Robot System and Artificial Life, *the First Conference on JSME Robotics and Mechatronics Symposia*, pp. 181–184 (in Japanese).
- [233] Nagayoshi, M. and Unemi, T. (1996) Toward Designing a Group of Autonomous Mobile Robots that Evolve, *SICE the 23th Intelligent System Symposium*, pp. 41–46 (in Japanese).
- [234] Koike, T., Nagayoshi, M., and Unemi, T. (1996) Evolution of Simple Growth System with Metabolism and Environmental Restraint, *SICE the 23th Intelligent System Symposium*, pp. 63–68 (in Japanese).
- [235] Unemi, T. (1995) Genetic Algorithms and Simulated Breeding, *the Third Workshop on Instrument and Information Analysis, National Institute of Agro-Environmental Sciences*, pp. 1–8 (in Japanese).
- [236] Yano, K., Hirayama, N., Masujima, Y., and Unemi, T. (1995) Order Emergence on a Road Traffic System by Reinforcement Learning Agents, *Sixth SICE Symposium on Decentralized Autonomous Systems*, pp. 297–300 (in Japanese).
- [237] Unemi, T. and Inagaki, Y. (1994) Symbiotic Robot Systems in Human Society – by Arrangement of Desks as an Example Task, *the 37th Japanese Joint Conference on Automatic Control*, pp. 23–26 (in Japanese).
- [238] Ono, S., Inagaki, Y., Aisu, H., Sugie, H., and Unemi, T. (1994) A Study of Fast and Feasible Reinforcement Learning Algorithms for Fuzzy Environment, *SICE the 20th Intelligent System Symposium*, pp. 201–205 (in Japanese).
- [239] Aisu, H., Inagaki, Y., Ono, S., Sugie, H., and Unemi, T. (1994) Human-Robot Cooperative Works by Fuzzy Planning, *Tenth Fuzzy System Symposium*, pp. 503–506 (in Japanese).



- [240] Nagayoshi, M., Hirayama, N., Masujima, Y., Yano, K., Nade, T., and Unemi, T. (1994) A Study on Evolution of Intrinsic Exploration Strategy in a Reinforcement Learning Method, *SICE the 19th Intelligent System Symposium*, pp. 7–10 (in Japanese).
- [241] Hirayama, N., Yano, K., Nagayoshi, M., Nade, T., Masujima, Y., and Unemi, T. (1994) On Relation between Evolutionary and Learning Adaptation, *SICE the 19th Intelligent System Symposium*, pp. 41–46 (in Japanese).
- [242] Nade, T., Nagayoshi, M., Hirayama, N., Masujima, Y., Yano, K., and Unemi, T. (1994) A Simple development System on 3D Euclidean Space and Its Evolution, *IPSJ SIG-AI*, Vol. 94, No. 20, pp. 25–30 (in Japanese).
- [243] Unemi, T. (1992) A-Life and Animats are Interesting, *IPSJ SIG-AI*, Vol. 92, No. 51, 92-AI-83-1-3, pp. 7–8 (in Japanese).
- [244] Unemi, T. (1992) A Food Seeker Based on an Instance-based Reinforcement Learning Method, Demonstration in *the Third International Workshop on Artificial Life*, Santa Fe, NM.
- [245] Ogura, H., Shōnō, H., Unemi, T., and Yoshitani, Y. (1992) A Design of Programming Environment for Classifier System, *SICE the 15th Intelligent System Symposium*, pp. 13–18 (in Japanese).
- [246] Koike, A., Unemi, T., and Yoshitani, Y. (1992) Control of a Delayed System Using a Genetic Algorithm, *SICE the 15th Intelligent System Symposium*, pp. 7–12 (in Japanese).
- [247] Unemi, T., Uekou, Y., Koike, A., and Yoshitani, Y. (1992) A Learning Control of an Unstable System and a Delayed System by an Instance-based Learning, *SICE the 15th Intelligent System Symposium*, pp. 187–192 (in Japanese).
- [248] Koike, A., Ogura, H., Unemi, T., and Yoshitani, Y. (1991) A Control Method for an Unstable System by a Genetic Algorithm, *SICE the 14th Intelligent System Symposium*, pp. 169–175 (in Japanese).
- [249] Unemi, T., Koike, A., and Yoshitani, Y. (1991) A Learning Control of an Unstable System by an Instance-based Reinforcement Learning Method, *SICE the 14th Intelligent System Symposium*, pp. 381–386 (in Japanese).
- [250] Unemi, T. (1991) Instance-based Reinforcement Learning Method, *IPSJ SIG-AI*, Vol. 91, No. 75, 91-AI-78-9 (in Japanese).
- [251] Unemi, T. (1991) Parallelism / Decentralization / Cooperation are Necessary for A-Life, *IPSJ SIG-AI*, Vol. 91, No. 62, pp. 181–182 (in Japanese).
- [252] Unemi, T. (1991) On Embedding an Inductive Learning Schema into a Memory-based Learning System, *IPSJ SIG-AI*, Vol. 91, No. 42, 91-AI-76-7 (in Japanese).
- [253] Unemi, T. (1991) A Memory-based Learning of Discrete Time Sequences and its Application to a Simulation of Environmental Adaptation, *Workshop on Learning '91*, in Teine, Hokkaidō, pp. 68–79 (in Japanese).
- [254] Hayase, Y., Unemi, T., and Kawada, S. (1991) A Chunking Mechanism to Adapt to an Environment, *IPSJ SIG-AI*, Vol. 91, No. 3, 91-AI-74-4, pp. 29–38 (in Japanese).
- [255] Ohsuga, A., Unemi, T., Ejima, T., and Miyahara, M. (1990) On Understanding the Order of Actions, *IEICE NLC90-20* (in Japanese).
- [256] Ogura, H. and Unemi, T. (1990) On Memory Management Algorithms for Rote Learning by Machine, *IPSJ SIG-AI*, Vol. 90, No. 70, 90-AI-72-3 (in Japanese).
- [257] Unemi, T. (1990) No Intelligence Without Environment, *IPSJ SIG-AI*, Vol. 90, No. 57, 90-AI-71-1-6, pp. 13–14 (in Japanese).
- [258] Unemi, T. (1990) A Computational Model of Adaptive Mechanism Based on Prediction and Reflection, *the Seventh Annual Conference of Japanese Cognitive Science Society*, pp. 62–63 (in Japanese).
- [259] Unemi, T. (1990) A Rote Learning Mechanism for Time-sequence Based on Prediction and Reflection, *IPSJ SIG-AI*, Vol. 90, No. 32, 90-AI-70-4 (in Japanese).
- [260] Ohsuga, A., Unemi, T., and Ejima, T. (1990) On Understanding Action Order from Japanese Sentences, *IEICE Annual Conference, Spring '99*, D-85 (in Japanese).

- [261] Unemi, T. (1990) A Simulation of Environmental Adaptation by Rote Learning of Sequences, *SICE the 11th Knowledge and Intelligent System Symposium*, pp. 151–156 (in Japanese).
- [262] Hayase, Y. and Unemi, T. (1990) Adaptive Revision of Abstraction Level for Representation Unit in Sequence Learning, *Workshop on Learning '90*, in Teine, Hokkaidō, pp. 104–111 (in Japanese).
- [263] Unemi, T. (1990) A Rote Learning of Discrete Time Sequences and its Application to a Simulation of Environmental Adaptation, *Workshop on Learning '90*, in Teine, Hokkaidō, pp. 112–120 (in Japanese).
- [264] Unemi, T. (1989) A Taxonomy of Learning Research, *IPSJ Symposium on Learning Paradigm and Application*, pp. 79–88 (in Japanese).
- [265] Unemi, T. (1989) A Rote Learning Mechanism for Discrete Time Sequence and Its Application for a Testbed, *IPSJ SIG-AI*, Vol. 89, No. 91, 89-AI-67-4 (in Japanese).
- [266] Nakano, K., Watanabe, M., Kurita, K., Unemi, T., and Miyake, J. (1989) A Case Study on Comparison between Menu and DMI User Interfaces, *IEICE SIG ME & Bio-cybernetics*, (in Japanese).
- [267] Unemi, T. (1989) A Memory-based Learning for Discrete Time Sequences, *Workshop on Learning '89*, in Teine, Hokkaidō, pp. 1–4 (in Japanese).
- [268] Unemi, T. (1988) A Rote Learning of Discrete Time Sequences, *SICE the Eighth Knowledge Engineering Symposium*, pp. 47–50 (in Japanese).
- [269] Unemi, T. (1988) Amalgamation between Signals and Symbols by Abstraction Links, *the Fifth Annual Conference of Japanese Cognitive Science Society*, p. 50–51 (in Japanese).
- [270] Unemi, T. (1988) Again, Research of Learning to Considering Human Beings – toward a learning model of individual, *Workshop on Learning '88*, in Teine, Hokkaidō, pp. 70–79 (in Japanese).
- [271] Unemi, T. (1987) A Concurrent Execution Prolog Based on an Agenda Control, *IPSJ SIG-AI*, Vol. 87, No. 63, 87-AI-54-3 (in Japanese).
- [272] Unemi, T. (1987) A Framework of Analogy for Various Data Types, *Workshop on Learning '87*, in Ootaki, Hokkaidō, pp. 73–87 (in Japanese).
- [273] Unemi, T., Yamamura, M., and Kobayashi, S. (1986) Algorithms of Analogy for Various Data types, *the Third Annual Conference of Japanese Society of Software Science*, pp. 201–204 (in Japanese).
- [274] Unemi, T. (1986) Discovery of Data Types as a View Point, *Fujitsu Laboratory for International Information Social Science, Summer Symposium on Knowledge System Methodology*, pp. 266–282 (in Japanese)
- [275] Unemi, T. (1986) A Framework of Inductive Learning to Accept Various Types of Input Data, *the Third Annual Conference of Japanese Cognitive Science Society*, p. 78 (in Japanese).
- [276] Unemi, T. (1986) TSS Terminal Emulator with Multi-window System, *IPSJ the 32nd Annual Conference*, pp. 1307–1308 (in Japanese).
- [277] Unemi, T. (1986) An Extension of Learning Function – Extending Acceptable Data Types, *Symposium on Issues on Learning*, in Hokkaidō University, pp. 28–37 (in Japanese).
- [278] Unemi, T. (1985) TSS Emulator with Window System on NEC PC-9801E/F/m (Version 1.0) User's Manual, *Systems Science Research Report, Tokyo Institute of Technology*, No. 14.
- [279] Unemi, T. and Kobayashi, S. (1985) Concurrent Interactive Diagnostic System, *SICE the First Knowledge Engineering Workshop*, (in Japanese).
- [280] Unemi, T. (1985) A Fast Matching Technique for General List Structures, *IPSJ 30th Annual Conference*, pp. 1529–1530 (in Japanese).
- [281] Unemi, T. (1984) A Distributed Production System Co-PSs and Its Application, *SICE 23rd Annual Conference*, pp. 1023–1024 (in Japanese).
- [282] Unemi, T. (1984) A Fundamental Cognition/Behavior Model with a Learning Function, *the First Annual Conference of Japanese Cognitive Science Society*, pp. 16–17 (in Japanese).

- [283] Kobayashi, S., Unemi, T., and Mochizuki, H. (1984) An Expert System for Reference List Analysis, *IPSJ SIG-AI*, Vol. 84 (in Japanese).
- [284] Unemi, T. and Kobayashi, S. (1984) Co-PSs: A Distributed Production System Based on Process Concept, *IPSJ 28th Annual Conference*, (in Japanese).
- [285] Unemi, T., Tanaka, H., and Ichikawa, A. (1980) Extension of Extended LINGOL to N-ary Tree, *IPSJ SIG Computational Linguistics*, (in Japanese).
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