

Takuo Watanabe

Associate Professor, Dr. Sci.

Contact

Department of Computer Science,
Graduate School of Information Science and Engineering,
Tokyo Institute of Technology
W8-75, 2-12-1 Ookayama, Meguroku, Tokyo 152-8552, Japan

Phone: +81-(0)3-5734-3690

Facsimile: +81-(0)3-5734-2772

E-mail: takuo@cs.titech.ac.jp, takuo@acm.org

Web: <http://www.psg.cs.titech.ac.jp/~takuo/>

Personal

Birthdate: 25, July, 1963

Marital Status: married

Nationality: Japan

Education

Doctor of Science, Mar. 1991

Department of Information Science, Tokyo Institute of Technology

Thesis: *Object-Oriented Models for Reflection in Concurrent Systems*

Advisor: Prof. Akinori Yonezawa

Master of Science, Mar. 1988

Department of Information Science, Tokyo Institute of Technology

Thesis: *Reflection in Object-Oriented Concurrent Systems*

Advisor: Prof. Akinori Yonezawa

Bachelor of Science, Mar. 1986

Department of Information Science, Tokyo Institute of Technology

Thesis: *A Japanese Dialog System Applicable to Multiple Discourse Domains*

Advisor: Prof. Akinori Yonezawa

Research Interests

Design and Implementations of Programming Languages

Foundations of Software

Computational Reflection

Employment and Research Experience

Jan. 2001–present Associate Professor

Department of Computer Science

Graduate School of Information Science and Engineering

Tokyo Institute of Technology

Apr. 2002–Mar. 2004 Associate Professor

Software Research Division

National Institute of Informatics

- Apr. 1992–Dec. 2000 Associate Professor
 School of Information Science
 Japan Advanced Institute of Science and Technology
- Sep. 1991–Mar. 1992 Visiting Research Assistant Professor
 Department of Computer Science
 University of Illinois at Urbana-Champaign
- Apr. 1991–Mar. 1992 JSPS Junior Researcher (PD)
 Department of Information Science
 The University of Tokyo
- Apr. 1990–Mar. 1991 JSPS Junior Researcher (DC)
 Department of Information Science
 Tokyo Institute of Technology

Publications

Journal Papers

- Kiyoshi Yamada & Takuo Watanabe, An Aspect-Oriented Approach to Modular Behavioral Specifications, *Electronic Notes in Theoretical Computer Science*, Vol. 163, No. 1, pp. 45–56, Sep., 2006.
- Kiyoshi Yamada & Takuo Watanabe, Moxa: An Aspect-oriented Behavioral Interface Specification Language *Transactions of Information Processing Society of Japan*, Vol. 46, No. SIG-11 (PRO-26), pp. 27–44, Aug., 2005.
- Yuji Ichisugi, Akira Tanaka & Takuo Watanabe Rules for Safe Composition of Mix-ins, *Computer Software*, Japan Society for Software Science and Technology, Vol. 20, No. 3, pp. 292–299, May, 2003.
- Noriki Amano & Takuo Watanabe, LEAD++: An Object-Oriented Reflective Language for Dynamically Adaptable Software Model, *IEICE Transactions on Fundamental of Electronics, Communications and Computer Science*, Vol. E82-A, No. 6, pp. 1009–1016, Jun., 1999.
- Noriki Amano & Takuo Watanabe, LEAD : The Design and Implementation of a Language for Constructing Dynamically Adaptable Software, *Transactions of Information Processing Society of Japan*, Vol. 39, No. 9, pp. 2649–2658, Sep., 1998.
- Noriki Amano & Takuo Watanabe, LEAD: A Language for Dynamically Adaptable Applications, *IEICE Transactions on Fundamental of Electronics, Communications and Computer Science*, Vol. E81-A, No. 6, pp. 992-1000, Jun., 1998.
- Shusaku Iida, Kokichi Futatsugi & Takuo Watanabe, A Method for Creating and Verifying Formal Specifications of Distributed Systems in CafeOBJ *Computer Software*, Japan Society for Software Science and Technology, Vol. 15, No. 1, pp. 34–49, Jan., 1998.
- Hidehiko Masuhara, Satoshi Matsuoka & Takuo Watanabe, Design and Implementation of an Object-Oriented Concurrent Reflective Language ABCL/R2, *Computer Software*, Japan Society for Software Science and Technology, Vol. 11, No. 3, pp. 175–192, May, 1994.
- Takuo Watanabe, A Tutorial Introduction to Computational Reflection, *Computer Software*, Japan Society for Software Science and Technology, Vol. 11, No. 3, pp. 165–174, May, 1994.

Takuo Watanabe, Ichirou Ohsawa & Akinori Yonezawa, A Japanese Dialog System Applicable to Multiple Discourse Domains, *Journal of Japanese Society for Artificial Intelligence*, Vol. 2, No. 2, pp. 206–213, Jul., 1987.

Reviewd Conference Papers

Takuo Watanabe, Towards Formalizing Operational Aspects of Reflective Computation, *4th Asian Workshop on Aspect-Oriented Software Development (AOAsia 2008)*, pp. 21–24, Dec., 2008.

Takuo Watanabe & Kiyoshi Yamada, An Aspect-Oriented Behavioral Interface Specification Language, *2nd Workshop on Formal Languages and Analysis of Contract-Oriented Software (FLACOS 2008)*, pp. 85–92, Nov., 2008.

Naoyuki Nagatou & Takuo Watanabe, Run Time Detection of Covert Channels, *International Symposium on Frontiers in Availability, Reliability and Security (FARES)*, pp. 577–584, IEEE Press, Apr., 2006.

Michael Reinsch & Takuo Watanabe, Towards Reusable Heterogeneous Data-Centric Disentangled Parts, *Workshop on Reflection, AOP and Meta-Data for Software Evolution (RAM-SE 2005)*, pp. 29–38, Jul., 2005.

Naoyuki Nagatou & Takuo Watanabe, Execution Monitoring and Information Flow Properties, *Workshop on Dependable Software - Tools and Methods*, IEEE Press, pp. 221–227, Jun., 2005.

Kiyoshi Yamada & Takuo Watanabe, An Aspect-Oriented Approach to Modular Behavioral Specification of Java Components *IASTED International Conference on Software Engineering (SE 2005)*, pp. 360–365, Acta Press, Feb., 2005.

Takuo Watanabe, Kiyoshi Yamada & Naoyuki Nagatou, Specifying Context-Aware Runtime Security Policies using an Algebraic Policy Specification Language, *IASTED International Conference on Software Engineering (SE 2004)*, pp. 662–667, Acta Press, Feb., 2004.

Noriki Amano & Takuo Watanabe, LampJ: A Library of Adaptable Modular Programming for Java, *IASTED International Conference on Software Engineering and Applications (SEA 2003)*, pp. 465–470, Acta Press, Nov., 2003.

Takuo Watanabe, Kiyoshi Yamada & Naoyuki Nagatou, Towards a Specification Scheme for Context-Aware Security Policies for Networked Appliances, *IEEE Workshop on Software Technologies for Future Embedded Systems (STFES 2003)*, pp. 65–68, IEEE Press, May, 2003.

Etsuya Shibayama, Shigeki Hagihara, Naoki Kobayashi, Shin-ya Nishizaki, Kenjiro Taura & Takuo Watanabe, AnZenMail: A Secure and Certified E-mail System, *Software Security: Theories and Systems*, pp. 201–216, Lecture Notes in Computer Science, 2609, Mar., 2003.

Noriki Amano & Takuo Watanabe, A Software Model for Flexible and Safe Adaptation for Mobile Code Programs, *International Workshop on Principles of Software Evolution (IWPSE 2002)*, pp. 57–61, IEEE Press, May, 2002.

Noriki Amano & Takuo Watanabe, Towards Constructing Component-based Software Systems with Safe Dynamic Adaptability, *International Workshop on Principles of Software Evolution (IWPSE 2001)*, pp. 176–180, IEEE Press, Sep., 2001.

Takuo Watanabe & Noriki Amano, A Secure Dynamic Extension Mechanism for Mobile Agents, *Symposium on Software Mobility and Adaptive Behavior*, pp. 28–31, AISB, Mar., 2001.

Noriki Amano & Takuo Watanabe, Towards Constructing Mobile Code Programs with Safe Dynamic Adaptability, *Symposium on Software Mobility and Adaptive Behavior*, pp. 105–113, AISB, Mar., 2001.

Noriki Amano & Takuo Watanabe, An Approach for Constructing Component-based Software Systems with Dynamic Adaptability using LEAD++, *International Symposium on Principles of Software Evolution (ISPSE 2000)*, IEEE Press, pp. 118–127, Nov., 2000.

Takuo Watanabe, Noriki Amano & Kenji Shinbori, Towards a Modular Substrate for Reliable Mobile Agent Systems, *International Workshop on Reflective Middleware (RM2000)*, pp. 20-24, Apr., 2000.

Kazuhiro Fujieda, Takuo Watanabe & Koichiro Ochimizu, CORBA Application Development Environment using Reflection, *International Symposium on Future Software Technology (ISFST 99)*, pp. 149–154, IEEE Press, Oct., 1999.

Noriki Amano & Takuo Watanabe, LEAD++: An Object-Oriented Language based on a Reflective Model for Dynamic Software Adaptation, *International Conference on Technology of Object-Oriented Languages and Systems (TOOLS Asia 99)*, pp 41–50, IEEE Press, Sep., 1999.

Noriki Amano & Takuo Watanabe, Reflection for Dynamic Adaptability: A Linguistic Approach using LEAD++, *International Conference on Meta-Level Architectures and Reflection (Reflection '99)*, Lecture Notes in Computer Science, Vol. 1616, pp. 138–140, Jul., 1999.

Akira Tanaka & Takuo Watanabe, An Extensible LR Parser Generator: A Case Study of Composable Metalevel Extensions, *International Workshop on Principles of Software Evolution (IWPSE)*, pp. 84-88, Jul., 1999.

Yutaka Saeki & Takuo Watanabe, Towards a Modular Construction Method of Extensible Compilers, *International Workshop on Principles of Software Evolution (IWPSE)*, pp. 79-83, Jul., 1999.

Takuro Kitayama, Tatsuo Nakajima, Takuo Watanabe, Katsuhiko Gondow, Ichiro Satoh & Hideyuki Tokuda, SMAF: A Framework for Future Embedded Systems, *IEEE International Workshop on Networked Appliances*, S2-1, pp. 1–4, Nov., 1998.

Noriki Amano & Takuo Watanabe, LEAD++: An Object-Oriented Language for Dynamically Adaptable Software Model, *IEICE International Conference on Circuit/Systems, Computers and Communications (ITC-CSCC)*, pp. 1143–1146, Jul., 1998.

Hiroshi Ishikawa, Jose Meseguer, Takuo Watanabe, Kokichi Futatsugi & Hideyuki Nakashima, On the Semantics of GAEA, *Fuji International Symposium on Functional and Logic Programming (FLOPS)*, World Scientific, pp. 123-141, Apr., 1998.

Noriki Amano & Takuo Watanabe, A Procedural Model of Dynamic Adaptability and Its Description Language, *International Workshop on Principles of Software Evolution (IWPSE)*, pp. 103-107, Apr., 1998.

Noriki Amano & Takuo Watanabe, LEAD: A Linguistic Approach to Dynamic Adaptability for Practical Applications, *IFIP International Conference on Systems Implementation 2000: Languages, Methods and Tools*, Chapman & Hall, pp. 277–290, Feb., 1998.

Noriki Amano & Takuo Watanabe, A Linguistic Approach for Dynamically Adaptable Applications, *IPSJ International Symposium on Information Systems and Tech-*

nologies for Network Society, World Scientific, pp. 403-406, Sep., 1997.

Noriki Amano & Takuo Watanabe, LEAD: A Language for Adaptable Applications, *IEICE International Conference on Circuit/Systems, Computers and Communications (ITC-CSCC)*, pp. 825–828, Jul., 1997.

Hiroshi Ishikawa, Kokichi Futatsugi & Takuo Watanabe, An Example for Concurrent Reflective Computations in Rewriting Logic, *IFIP 1st International Workshop on Formal Methods in Open Object-based Distributed Systems (FMOODS)*, pp. 178–185, Chapman & Hall, 1996.

Shusaku Iida, Kokichi Futatsugi & Takuo Watanabe, Algebraic Specification of Distributed Systems based on Concurrent Object-Oriented Modeling, *IFIP 1st International Workshop on Formal Methods in Open Object-based Distributed Systems (FMOODS)*, pp. 341–356, Chapman & Hall, Mar., 1996.

Hidehiko Masuhara, Satoshi Matsuoka, Takuo Watanabe & Akinori Yonezawa, Object-Oriented Concurrent Reflective Languages Can be Implemented Efficiently, *Proceedings of the ACM Conference on Object-Oriented Programming Systems, Languages, and Applications (OOPSLA)*, pp. 127–144, ACM, 1992.

Satoshi Matsuoka, Takuo Watanabe, Yuji Ichisugi & Akinori Yonezawa, Object-Oriented Concurrent Reflective Architectures, *Object-Based Concurrent Computing*, Lecture Notes in Computer Science, 612, Springer-Verlag, 1992.

Satoshi Matsuoka, Takuo Watanabe & Akinori Yonezawa, Hybrid Group Reflective Architecture for Object-Oriented Concurrent Reflective Programming, *Proceedings of European Conference on Object-Oriented Programming (ECOOP)*, Lecture Notes in Computer Science, 512, pp. 231–250, Springer-Verlag, 1991.

Takuo Watanabe & Akinori Yonezawa, An Actor-Based Metalevel Architecture for Group-Wide Reflection, *Foundations of Object-Oriented Languages (REX/FOOL)*, Lecture Notes in Computer Science, Vol. 489, pp. 405–425, Springer-Verlag, 1991.

Takuo Watanabe & Akinori Yonezawa, Reflective Computation in Object-Oriented Concurrent Systems and Its Applications, *Proceedings of IEEE Fifth International Workshop on Software Specification and Design (IWSSD)*, pp. 56–58, 1989.

Akinori Yonezawa & Takuo Watanabe, An Introduction to Object-Based Reflective Concurrent Computation, *Proceedings of the ACM SIGPLAN Workshop on Object-Based Concurrent Programming*, SIGPLAN Notices, Vol. 24, No. 4, 1989.

Takuo Watanabe & Akinori Yonezawa, Reflection in an Object-Oriented Concurrent Language, *Proceedings of the ACM Conference on Object-Oriented Programming Systems, Languages, and Applications (OOPSLA)*, pp. 306–315, Oct., 1988.

Books and Book Chapters

Takuo Watanabe, *Data Structures and Algorithms*, Baifukan, 2009 (to be published).

Takuo Watanabe & Satoshi Matsuoka, CLOS and Metaobject Protocol, *Object-Oriented Computing*, Chapter 4, pp. 153–192, Iwanami Pub., 1993.

Takuo Watanabe & Akinori Yonezawa, Reflection in an Object-Oriented Concurrent Language, *ABCL: An Object-Oriented Concurrent System*, Chapter 3, pp. 45–70, MIT Press, 1990.

Awards

2003

Tokyo Tech Award for Challenging Research (Tokyo Institute of Technology)
Software Detoxification based on a High-Level Introspection Mechanism

1991 IPSJ SIG Research Award (Information Processing Society of Japan)
 A Concurrent Reflective Computation Model based on Actor Paradigm

Research Grants

Highly Scalable Software Security for Information Explosion Environments, MEXT Grand-in-Aid for Scientific Research on Priority Areas (*New IT Infrastructure for the Information-explosion Era*, A02-00-02), 18049027, 2006-2010.

Safe Dynamic Composition and Secure Execution of Software Based on Static Analysis and Execution Monitoring, MEXT Grand-in-Aid for Scientific Research (C), 17500017, 2005–2006.

Research on Declarative Description and Consistency Checking of Policies for Adaptive Software, MEXT Grand-in-Aid for Scientific Research (C), 15500028, 2003–2004.

Foundations on Securely Extensible/Adaptable Software Systems, MEXT Grand-in-Aid for Scientific Research on Priority Areas (*Implementation Schemes for Secure Software*, A02-06), 12133207, 2000–2003.

A Modularization Method of Non-Functional Requirements for Adaptive Mobile Objects, MEXT Grand-in-Aid for Scientific Research (C), 12680340, 2000–2001.

Study on Foundations of Dynamically Adaptable Software Systems, MEXT Grand-in-Aid for Scientific Research on Priority Areas (*Principles for Constructing Evolutionary Software*), 10139215, 1998.

Dynamic Adaptation based on Reflective Architecture and its Applications to Mobile Computing Environment, MEXT Grand-in-Aid for Scientific Research on Priority Areas (*Principles for Constructing Evolutionary Software*), 09245213, 1997.

Reflection in an Object-Oriented Concurrent Language and its Applications, MEXT Grant-in-Aid for Scientific Research (JSPS junior researcher), 02952187, 1990–1991.

Academic Membership

Association for Computing Machinery
IEEE Computer Society
USENIX
Japan Society for Software Science and Technology
Information Processing Society of Japan

Oct. 15, 2008