Naoki Tanaka

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Interests

Information Security, Risk Analysis, Data Mining, Machine Learning

Education

Ph.D., Computer Science — December 2014
University of Illinois at Urbana-Champaign, Urbana, IL
Thesis title: Sustainable Approaches to Ad-Hoc Information Sharing for Virtual Organizations
Advisor: Professor Marianne Winslett
GPA: 4.0 (Cumulative)

Master of Information Science and Technology, Bioinformatic Engineering — March 2005
Osaka University, Osaka, Japan
Thesis title: A Method for Analyzing Metabolic Networks Based on Gene Essentiality in a Focus of Compounds
GPA: 4.0 (Cumulative)

Bachelor of Engineering, Information and Computer Sciences — March 2003
Osaka University, Osaka, Japan
Thesis title: A Systematic Method for the Experimental Data Analysis of the Gene Disruption Strains of E. coli
GPA: 3.87 (Cumulative), 3.94 (Major); *Kusumoto Award* (Top Student)

Experience

Senior Software Engineer — August 2014 - Present
Solaris Security Engineering Group, **Oracle America, Inc.**, Santa Clara, CA

- Developing Verified Boot feature of Solaris operating system in C to detect accidental or malicious modification of a kernel module before loading and executing it by checking the factory-signed signature in it.

Research Assistant — August 2010 - July 2014
Department of Computer Science, **University of Illinois at Urbana-Champaign**, Urbana, IL

- Designed a rational approach based on actuarial methods to encourage appropriate information sharing inside a virtual organization.
- Developed a discrete event simulator for the proposed approach in C++ with Boost C++ Libraries and its GUI interface for Mac in Objective-C with Core Plot framework.
- Designed and implemented with Node.js and MongoDB an online business simulation game to evaluate my approach.
- Conducted experiments using Amazon Mechanical Turk, and confirmed that my approach could benefit an organization even when human decisions are involved.
- Designed game theoretic and decision theoretic risk token allocation mechanisms for risk-aware authorization.

Software Engineer Intern — May 2013 - August 2013
Feed Ranking/Feed Ads Team, **Facebook Inc.**, Menlo Park, CA

- Developed a web interface using PHP and JavaScript that makes it possible to holistically analyze ads data taken from multiple data sources.
- Added new features used by learning algorithms for feed ranking using PHP, C++, and Hive, and one of the newly added features ranked #1 for feed ads ranking in terms of the importance of features.

Research Fellow October 2011 - October 2012
Cryptography & Security Department, **Institute for Infocomm Research**, Singapore, Singapore

- Interned under the A*STAR Graduate Academy's A*STAR Research Attachment Programme in Singapore for one year.
- Proposed and analyzed using C++ with Boost C++ Libraries a decision framework that enables a virtual organization to select an optimal portfolio of risky data accesses that will maximize the benefit subject to a given risk budget.

Attention Science Intern May 2011 - August 2011
Attention Science Team, **Simulmedia**, New York, NY

- Interned as one of the inaugural fellows of the NYC Turing Fellows Program, which seeks to match top computer science and engineering students with outstanding summer internships at leading NYC startups.
- Proposed effective statistical and visualization methods using Python, PostgreSQL, and Gnuplot for analyzing TV ad campaign structures from huge amount of set-top box data.

Research Assistant January 2010 - August 2010
Information Trust Institute, **University of Illinois at Urbana-Champaign**, Urbana, IL

- Developed a distributed non-intrusive load monitoring program in Java using genetic algorithm with JGAP framework and dynamic programming.

Teaching Assistant August 2009 - December 2009
Department of Computer Science, **University of Illinois at Urbana-Champaign**, Urbana, IL

- Led discussion sections of an introductory Computer Science & Java class for CS majors.

Corporate IT Staff April 2009 - July 2009
Information Systems, **Astellas Pharma Inc.**, Tokyo, Japan

- Managed various company-wide IT projects.

Cheminformatics Researcher April 2005 - March 2009
Drug Discovery Research, **Astellas Pharma Inc.**, Ibaraki, Japan

- Located several active compounds by applying data mining techniques such as random forests written in C++ to huge volume of assay data stored in Oracle DB using HPC cluster and Grid computing environments such as Platform LSF and Oracle Grid Engine.
- Constructed an LDAP+Kerberos centralized single-sign-on authentication system by Redhat Enterprise Linux in the heterogeneous environment of Linux and Windows.

Refereed Publications

Naoki Tanaka, Marianne Winslett, Adam J. Lee, David K. Y. Yau, Feng Bao: "Insured Access: An Approach to Ad-hoc Information Sharing for Virtual Organizations", Proceedings of the third ACM Conference on Data and Application Security and Privacy (CODASPY), pp. 301-308, San Antonio, TX, USA, February 2013.

Yuhao Zheng, David M. Nicol, Dong Jin, **Naoki Tanaka**: "A Virtual Time System for Virtualization-Based Network Emulations and Simulations", Journal of Simulation, 6 (3), pp. 205-213, August 2012.

David C. Bergman, Dong Jin, Joshua P. Juen, **Naoki Tanaka**, Carl A. Gunter, Andrew K. Wright: "Distributed Non-Intrusive Load Monitoring", Proceedings of the 2011 IEEE/PES Conference on Innovative Smart Grid Technologies (ISGT), Anaheim, CA, USA, January 2011.

David C. Bergman, Dong Jin, Joshua P. Juen, **Naoki Tanaka**, Carl A. Gunter, Andrew K. Wright: "Nonintrusive Load-Shed Verification", IEEE Pervasive Computing, 10 (1), pp. 49-57, January 2011.

Naoki Tanaka, Kazuki Ohno, Tatsuya Niimi, Ayako Moritomo, Kenichi Mori, Masaya Orita: "Small-World Phenomena in Chemical Library Networks: Application to Fragment-Based Drug Discovery", Journal of Chemical Information and Modeling, 49 (12), pp. 2677-2686, December 2009.

Presentations and Demos

Naoki Tanaka: "A Method for HTS Hit Selection Considering Compounds' Properties and Its Implementation with Spotfire Guides", Proceedings of the 5th Spotfire Japan User Conference, November 2007. (presented in Japanese)

Posters

Naoki Tanaka, Takeyosi Miki, Yoshihiro Yamamoto, Reiji Teramoto, Yoichi Takenaka, Hideo Matsuda: "A Method for Exploring Compounds Related to Gene Essentiality Considering Differences of Metabolic Network Structures among Different Species", Proceedings of the 27th Annual Meeting of the Molecular Biology Society of Japan, 2PB-422, December 2004. (presented in Japanese)

Kaoru Kashimoto, Akiko Yamada, **Naoki Tanaka**, Yoshihiro Yamamoto, Hideo Matsuda, Katsumi Isono, Hirotada Mori, Takashi Horuichi, Takeyosi Miki: "Systematic and Exhaustive Construction of Gene Disruption Strains of E.coli — Identification of Essential Genes for Cell Growth", Proceedings of the 27th Annual Meeting of the Molecular Biology Society of Japan, 2PB-320, December 2004. (presented in Japanese)

Takeyosi Miki, Yoshihiro Yamamoto, Kouji Hayashi, **Naoki Tanaka**, Katsutoshi Fujita, Akira Nakagawa, Kaoru Kashimoto, Satomi Obata, Hideo Matsuda, Katsumi Isono, Takashi Horiuchi, Hirotada Mori: "Systematic and Exhaustive Construction of Gene Disruption Strains of E.coli", Proceedings of the 26th Annual Meeting of the Molecular Biology Society of Japan, 4PA-159, December 2003. (presented in Japanese)

Naoki Tanaka, Takeyosi Miki, Yoshihiro Yamamoto, Yoichi Takenaka, Hideo Matsuda: "A Method for Analyzing Network Structure of Metabolic Pathways for Essential Gene Prediction", Proceedings of the 26th Annual Meeting of the Molecular Biology Society of Japan, 3PA-053, December 2003. (presented in Japanese)

Naoki Tanaka, Takeyosi Miki, Yoshihiro Yamamoto, Takashi Horiuchi, Hirotada Mori, Yoichi Takenaka, Hideo Matsuda: "An Integrated Method for Analyzing the Mutagenesis Data of the Gene-Disrupted Mutants of E. coli", Proceedings of the International Workshop for Escherichia coli Towards New Biology in the 21st Century, October 2003. (presented in Japanese)

Awards and Honors

*A*STAR Research Attachment* October 2011 - October 2012
A*STAR Research Attachment Programme, **A*STAR Graduate Academy**

NYC Turing Fellow April 2011
NYC Turing Fellows Program

Travel Scholarship August 2010
Information Trust Institute, **University of Illinois at Urbana-Champaign**

ITI Student Travel Scholarship April 2010
Information Trust Institute, **University of Illinois at Urbana-Champaign**

Study Abroad Scholarship August 2009 - July 2011
Heiwa Nakajima Foundation

Category 1 Scholarship April 2003 - March 2005
Japan Scholarship Foundation

Kusumoto Award (Top Student) March 2003
Osaka University

Reviews

16th European Symposium on Research in Computer Security (ESORICS 2011)

16th ACM Symposium on Access Control Models and Technologies (SACMAT 2011)

4th IFIP International Conference on Trust Management (IFIPTM 2010)

2nd International Conference Computer Science and its Applications (CSA 2009)

Activities

Mentor for Undergraduate Intern Summer 2010
Information Trust Institute, **University of Illinois at Urbana-Champaign**, Urbana, IL

- Guided an undergraduate summer intern for his daily research activities and paper/poster preparation.

Coursework

Database and Information Systems

- Advanced Database Systems (Professor Kevin Chang)
- Data Mining Principles (Professor Jiawei Han)
- Text Information Systems (Professor ChengXiang Zhai)

Computer Security

- Computer Security I (Dr. Susan Hinrichs)
- Security Laboratory (Dr. Susan Hinrichs)
- Advanced Computer Security (Professor Carl Gunter)

Systems and Networking

- Operating Systems Design (Professor Roy Campbell)
- Advanced Operating Systems (Professor Sam King)
- Distributed Systems (Professor Mehdi Harandi)

Seminar

- Secure Data Management (Professor Marianne Winslett)
- Yahoo!-DAIS Seminar (Professor Marianne Winslett)

Technical Skills

Languages: C/C++, Java, Objective-C, Perl, Python, PHP, JavaScript, Shell Script
Databases: Oracle, PostgreSQL, MySQL, Hive, MongoDB
Systems: Solaris, Linux (LPIC Level 3 Core, Security), Mac OS X, Windows
HPC: Platform LSF, Oracle Grid Engine, Condor
Servers: LDAP, Kerberos, Apache, Postfix, DNS/BIND, NFS, NIS
Tools: GCC, Make, Git, Mercurial, Subversion, Eclipse, Xcode
Others: Node.js, jQuery, XML, HTML, CSS, UML, LaTeX, R, Gnuplot, Spotfire

Membership

Association for Computing Machinery	February 2008 - Lifetime
Institute of Electrical and Electronics Engineers	January 2008 - Present
The Honor Society of Phi Kappa Phi	April 2011 - Lifetime