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## Takahiro Katagiri, Ph.D

As of 14th, January, 2017

### Education

- Apr 1994 – Mar 1996* **Kyoto University, Japan**  
Bachelor, Department of Information Technology
- Apr 1996 – Mar 1998* **The University of Tokyo, Japan**  
Master, Department of Computer Science, Graduate School of Science
- Apr 1998 – Mar 2001* **The University of Tokyo, Japan**  
Ph.D in Computer Science, Mar 2001.  
Department of Computer Science, Graduate School of Science

### Specialty

High Performance Computing, Auto-tuning, Massively Parallel Processing, Large-scale Eigenproblem

### Thesis

Katagiri Takahiro: *A Study on Large Scale Eigensolvers for Distributed Memory Parallel Machines*. 3/2001,  
Degree: Ph.D in Computer Science, Supervisor: Yasumasa Kanada

### Research Experience

- Apr 2016 – present* **Professor**  
Nagoya University, Information Technology Center, High Performance Computing Division, Aichi, Japan  
Nagoya University, Information Network Systems Group, Department of Information Engineering, Graduate School of Information Science, Aichi, Japan  
Nagoya University, Department of Information Engineering, School of Engineering, Aichi, Japan
- Apr 2007 – Mar 2016* **Professor (Associate)**  
The University of Tokyo, Information Technology Center, Supercomputer Research Division, Tokyo, Japan
- Mar 2005 – Feb 2006* **Visiting Scholar**  
University of California at Berkley, Department of Computer Science, California, U.S.A.

- Jun 2002 – Mar 2007 **Professor (Assistant)**  
The University of Electro-Communications, Graduate School of Information Systems, Tokyo, Japan
- Apr 2001 – May 2002 **Researcher**  
Japan Society for the Promotion of Science, Tokyo, Japan

## Awards & Grants

- Apr 2011 Award: Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Young Scientist Award
- Jul 2007 Award: Microsoft Innovation Award, Academic Division
- Dec 2002 Award: IPSJ Yamashita SIG Research Award

## Book Chapters

Takahiro Katagiri: *ABCLibScript: A Computer Language for Automatic Performance Tuning*. 01/2010: pages 295-313; ISBN: 978-1-4419-6935-4

## Journal and Conference Publications (Selected English articles)

- Takahiro Katagiri, Masaharu Matsumoto, Satoshi Ohshima: *Auto-tuning of Hybrid MPI/OpenMP Execution with Code Selection by ppOpen-AT*. The Eleventh International Workshop on Automatic Performance Tuning (iWAPT2016), Proceedings of IEEE IPDPSW2016; 05/2016
- Takahiro Katagiri, Satoshi Ohshima, Masaharu Matsumoto: *Directive-based Auto-tuning for the Finite Difference Method on the Xeon Phi*. The Tenth International Workshop on Automatic Performance Tuning (iWAPT2015), Proceedings of IEEE IPDPSW2015; 05/2015
- Takahiro Katagiri: *Towards Auto-tuning Facilities into Supercomputers in Operation -The FIBER approach and Minimizing Software-stack Requirements-*. 2014 Conference on Advanced Topics and Auto Tuning in High Performance Scientific Computing, National Taiwan University; 03/2014
- Teruo Tanaka, Ryo Otsuka, Ahihiro Fujii, Takahiro Katagiri, Toshiyuki Imamura: *Implementation of d-Spline-based incremental performance parameter estimation method with ppOpen-AT*. Scientific Programming, Vol. 22, No. 4, pp. 299-307; 07/2014
- Takahiro Katagiri, Junichi Iwata, Kazuyuki Uchida: *Extreme-Scale Parallel Symmetric Eigensolver for Very Small-Size Matrices Using A Communication-Avoiding for Pivot Vectors*. 16th SIAM Conference on Parallel Processing for Scientific Computing, Portland, Oregon, USA; 02/2014
- Takahiro Katagiri: *Impact of Auto-tuning of Kernel Loop Transformation by using ppOpen-AT*. International Workshop on Software for Peta-Scale Numerical Simulation (SPNS2013), Tokyo, Japan; 12/2013
- Takahiro Katagiri, Satoshi Ohshima, Masaharu Matsumoto: *ppOpen-AT : Yet Another Directive-base AT Language*. Dagstuhl Seminar 13401: Automatic Application Tuning for HPC Architectures, Dagstuhl, Germany; 09/2013

- Takahiro Katagiri, Cheng Luo, Reiji Suda, Shoichi Hirasawa, Satoshi Ohshima: *Energy Optimization for Scientific Programs Using Auto-tuning Language ppOpen-AT*. IEEE Embedded Multicore Socs (MCSoc), 2013, Tokyo, Japan; 09/2013
- Takahiro Katagiri, Satoshi Ito, Satoshi Ohshima: *Early Experiences for Adaptation of Auto-tuning by ppOpen-AT to an Explicit Method*. IEEE Embedded Multicore Socs (MCSoc), 2013, Tokyo, Japan; 09/2013
- Reiji Suda, Cheng Luo, Takahiro Katagiri: *A Mathematical Method for Online Autotuning of Power and Energy Consumption with Corrected Temperature Effects*. Eighth international Workshop on Automatic Performance Tuning (iWAPT2013) (In conjunction workshop with International Conference on Computational Science, ICCS2013), Barcelona, Spain; 06/2013
- Satoshi Ohshima, Masae Hayashi, Takahiro Katagiri, Kengo Nakajima: *Implementation and Evaluation of 3D Finite Element Method Application for CUDA*. Springer Lecture Notes in Computer Science. 01/2013; 7851: pages 140-148.
- Takahiro Katagiri, Pierre-Yves Aquilanti, Serge Petitot: *A Smart Tuning Strategy for Restart Frequency of GMRES(m) with Hierarchical Cache Sizes*. High Performance Computing for Computational Science - VECPAR 2012, Springer Lecture Notes in Computer Science. 01/2013; 7851: pages 314-328.
- Takahiro Katagiri, Takao Sakurai, Mitsuyoshi Igai, Satoshi Ohshima, Hisayasu Kuroda, Ken Naono, Kengo Nakajima: *Control Formats for Unsymmetric and Symmetric Sparse Matrix-Vector Multiplications on OpenMP Implementations*. High Performance Computing for Computational Science - VECPAR 2012, Springe Lecture Notes in Computer Science. 01/2013; 7851: pages 236-248.
- Takao Sakurai, Takahiro Katagiri, Hisayasu Kuroda, Ken Naono, Mitsuyoshi Igai, Satoshi Ohshima: *A Sparse Matrix Library with Automatic Selection of Iterative Solvers and Preconditioners*. 2013 International Conference on Computational Science, Procedia Computer Science. 01/2013; 18: pages 1332-1341.
- Satoshi Ito, Satoshi Ohshima, Takahiro Katagiri: *SSG-AT: An Auto-tuning Method of Sparse Matrix-vector Multiplicataion for Semi-Structured Grids - An Adaptation to OpenFOAM -*. 2012 IEEE 6th International Symposium on Embedded Multicore SoCs (MCSoc2012), Aizu-Wakamatsu, Japan; 09/2012
- Takahiro Katagiri, Masahiko Sato: *An Auto-tuning Method for Run-time Data Transformation for Sparse Matrix-Vector Multiplication*. IPSJ SIG Notes; 07/2011; 2011-HPC-130
- Takahiro Katagiri, Shoji Itoh: *A Massively Parallel Dense Symmetric Eigensolver with Communication Splitting Multicasting Algorithm*. Selected Papers of High Performance Computing for Computational Science - VECPAR 2010 - 9th International Conference, Springer Lecture Notes in Computer Science. 01/2011; 6449: pages 139-150.
- Takahiro Katagiri, Christof Vömel, James W. Demmel: *Automatic Performance Tuning for the Multi-section with Multiple Eigenvalues Method for Symmetric Tridiagonal Eigenproblems*. Selected Paper of Workshop On State-of-the-art in Scientific and Parallel Computing (PARA'06), Springer Lecture Notes in Computer Science. 09/2007; 4699: pages 938-948.
- Takahiro Katagiri, Kenji Kise, Hiroki Honda, Toshitsugu Yuba: *ABCLib\_DRSSD: A parallel eigensolver with an auto-tuning facility*. Parallel Computing. 03/2006; 32(3):pages 231-250.
- Teruo Tanaka, Takahiro Katagiri, Toshitsugu Yuba: *d-Spline Based Incremental Parameter Estimation in Automatic Performance Tuning*. Selected Paper of Workshop On State-of-the-art In Scientific And

- Parallel Computing (PARA'06), Springer Lecture Notes in Computer Science. 01/2006; 4699: pages 986-995.
- Takahiro Katagiri, Kenji Kise, Hiroki Honda, Toshitsugu Yuba: *ABCLibScript: a directive to support specification of an auto-tuning facility for numerical software*. Parallel Computing. 01/2006; 32(1): pages 92-112.
- Takahiro Katagiri, Christof Vömel, James W. Demmel: *Multi-section with Multiple Eigenvalues Method for Computing Eigenvalues in Symmetric Tridiagonal Eigensolvers*. IPSJ SIG Notes; 02/2006; SIG-HPC-107: pages 187-192.
- Satoshi Ohshima, Kenji Kise, Takahiro Katagiri, Toshitsugu Yuba: *Parallel Processing of Matrix Multiplication in a CPU and GPU Heterogeneous Environment..* High Performance Computing for Computational Science - VECPAR 2006, 7th International Conference, Rio de Janeiro, Brazil, June 10-13, 2006, 01/2006
- Sanya Tangpongpravit, Takahiro Katagiri, Kenji Kise, Hiroki Honda, Toshitsugu Yuba: *A time-to-live based reservation algorithm on fully decentralized resource discovery in Grid computing*. Parallel Computing. 01/2005; 31: pages 529-543.
- Kenji Kise, Takahiro Katagiri, Hiroki Honda, Toshitsugu Yuba: *Evaluation of the Acknowledgment Reduction in a Software-DSM System..* Parallel Processing and Applied Mathematics, 6th International Conference, PPAM 2005, Poznan, Poland, September 11-14, 2005; 01/2005
- Takahiro Katagiri, Kenji Kise, Hiroki Honda, Toshitsugu Yuba: *Effect of auto-tuning with user's knowledge for numerical software..* Proceedings of the First Conference on IEEE Computing Frontiers, 2004, Ischia, Italy, April 14-16, 2004; 01/2004
- Takahiro Katagiri, Kenji Kise, Hiroaki Honda, Toshitsugu Yuba: *FIBER: A Generalized Framework for Auto-tuning Software..* High Performance Computing, 5th International Symposium, ISHPC 2003, Tokyo-Odaiba, Japan, October 20-22, 2003, Springer Lecture Notes in Computer Science. 01/2003; 2858: pages 146-159.
- Takahiro Katagiri: *Performance Evaluation of Parallel Gram-Schmidt Re-Orthogonalization Methods*. Selected Papers and Invited Talks of High Performance Computing for Computational Science VECPAR 2002, Springer Lecture Notes in Computer Science. 05/2002; 2565: pages 302-314.
- Takahiro Katagiri, Yasumasa Kanada: *An Efficient Implementation of Parallel Eigenvalue Computation for Massively Parallel Processing*. Parallel Computing. 01/2002; 27(14): pages 60-76.
- Hisayasu Kuroda, Takahiro Katagiri, Yasumasa Kanada: *Knowledge Discovery in Auto-tuning Parallel Numerical Library*. Proceeding Progress in Discovery Science, Final Report of the Japanese Discovery Science Project; Springer. 01/2002; pages 628-639.
- Takahiro Katagiri, Hisayasu Kuroda, Yasumasa Kanada: *A Methodology for Automatically Tuned Parallel Tridiagonalization on Distributed Memory Vector-Parallel Machines*. Proceedings of VECPAR2000. 05/2000;
- Hisayasu Kuroda, Takahiro Katagiri, Yasumasa Kanada: *Performance of Automatically Tuned Parallel GMRES(m) Method on Distributed Memory Machines*. Proceedings of VECPAR2000. 02/2000;

Katagiri Takahiro: *A Study on Parallel Implementation of Large Scale Eigenproblem Solver for Distributed Memory Architecture Parallel Machines*. A Master Thesis, The University of Tokyo. 03/1998;