

# Curriculum Vitae

MORIKUNI Keiichi

## Contact

Dr. MORIKUNI Keiichi  
Department of Computer Science  
Institute of Systems and Information Engineering  
University of Tsukuba  
Tennodai 1-1-1, Tsukuba, Ibaraki, Japan 305-8573  
E-Mail: morikuni at sign cs.tsukuba.ac.jp, morikuni.keiichi.fw at sign u.tsukuba.ac.jp  
Webpage: <https://www.u.tsukuba.ac.jp/~morikuni.keiichi.fw/>

## Degree

Doctor of Philosophy

## Affiliations

Assistant Professor  
Department of Computer Science  
Institute of Systems and Information Engineering  
University of Tsukuba

## Research centers

- Center for Artificial Intelligence Research, University of Tsukuba.
- Academic Computing & Communications Center, University of Tsukuba.
- Research and Development Center for Precision Medicine, University of Tsukuba.

## Educational organizations

- College of Information Science, School of Informatics, University of Tsukuba.
- Master's/Doctoral Program in Computer Science, Degree Programs in Systems and Information Engineering, Graduate School of Science and Technology, University of Tsukuba.
- Ph.D. Program in Human Biology, Graduate School of Comprehensive Human Sciences, University of Tsukuba.
- Ph.D. Program in Humanics, School of Integrative and Global Majors, University of Tsukuba.
- Master's/Doctoral Program in Life Science Innovation, Degree Programs in Systems and Information Engineering, Graduate School of Science and Technology, University of Tsukuba.

## Research Interests

Numerical linear algebra, Matrix analysis, Numerical algorithms, Numerical analysis

## Professional Positions

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**June 1, 2015–Present** Assistant Professor, Department of Computer Science (ex. Division of Information Engineering), Institute of Systems and Information Engineering (ex. Faculty of Engineering, Information and Systems), University of Tsukuba, Japan

**April 10, 2014–May 11, 2015** Postdoctoral Fellow, Institute of Computer Science, Czech Academy of Sciences, Czech Republic.

**April 1 2013–March 31, 2014** Project Researcher, Uno Laboratory, Funding Program for World-Leading Innovative R&D on Science and Technology (FIRST) “Development of the Fastest Database Engine for the Era of Very Large Database and Experiment and Evaluation of Strategic Social Services Enabled by the Database Engine”, Principles of Informatics Research Division, National Institute of Informatics, Japan.

**April 1, 2008–February 28, 2013** Research Assistant, Principles of Informatics Research Division, National Institute of Informatics, Japan.

## Academic Qualifications

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**March 22, 2013** Doctor of Philosophy, 5-year Doctoral Course, Department of Informatics, School of Multidisciplinary Science, The Graduate University for Advanced Studies (SOKENDAI).

- Thesis Title: Inner-iteration Preconditioning for Least Squares Problems
- Supervisor: Ken Hayami

**April 2008–March 2013** 5-year Doctoral Course, Department of Informatics, School of Multidisciplinary Science, The Graduate University for Advanced Studies (SOKENDAI).

**March 25, 2008** Bachelor of Design, Supervisor Dr. Toshiya Samejima, Department of Acoustic Design, School of Design, Kyushu University.

- Thesis Title: Analysis of Acoustic Scattering from Multiple Obstacles with Arbitrary Boundary Conditions
- Supervisor: Toshiya Samejima

**April 2004–March 2008** Department of Acoustic Design, School of Design, Kyushu University.

## Academic Societies

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**2013–Present** Member of the International Linear Algebra Society, ILAS.

**2012–Present** Member of Society for Industrial and Applied Mathematics, SIAM.

**2008–Present** Member of The Japan Society for Industrial and Applied Mathematics, JSIAM.

**2014** Member of Information Processing Society of Japan, IPSJ.

**2008–2013** Student Member of the Acoustic Society of Japan, ASJ.

## Publications

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### Refereed Journal Papers

1. Akira Imakura, Keiichi Morikuni, and Akitoshi Takayasu, Verified eigenvalue and eigenvector computations using complex moments and the Rayleigh-Ritz procedure for generalized Hermitian eigenvalue problems, *Journal of Computational and Applied Mathematics*, Volume 424, 18 pages, May 1, 2023.  
DOI: 10.1016/j.cam.2022.114994
2. Akira Imakura, Keiichi Morikuni, and Akitoshi Takayasu, Complex moment-based methods for differential eigenvalue problems, *Numerical Algorithms*, Volume 92, pp. 693–721, January, 2023.  
DOI: 10.1007/s11075-022-01456-y
3. Kensuke Aihara, Akira Imakura, and Keiichi Morikuni, Cross-interactive residual smoothing for global and block Lanczos-type solvers for linear systems with multiple right-hand sides, *SIAM Journal on Matrix Analysis and Applications*, Volume 43, Issue 3, pp. 1308–1330, August 8, 2022.  
DOI: 10.1137/21M1436774

4. Per Christian Hansen, Ken Hayami, and Keiichi Morikuni, GMRES methods for tomographic reconstruction with an unmatched back projector, *Journal of Computational and Applied Mathematics*, Volume 413, 20 pages, April 22, 2022.  
DOI: 10.1016/j.cam.2022.114352
5. Zeyu Liao, Ken Hayami, Keiichi Morikuni, and Jun-Feng Yin, A stabilized GMRES method for singular and severely ill-conditioned systems of linear equations, *Japan Journal of Industrial and Applied Mathematics*, Volume 39, pp. 717–751, March 28, 2022.  
DOI: 10.1007/s13160-022-00505-2
6. Keiichi Morikuni, Projection method for eigenvalue problems of linear nonsquare matrix pencils, *SIAM Journal on Matrix Analysis and Applications*, Volume 42, Issue 3, pp. 1381–1400, September 20, 2021.  
DOI: 10.1137/20M1377886
7. Yi-Shu Du, Ken Hayami, Ning Zheng, Keiichi Morikuni, and Jun-Feng Yin, Kaczmarz-type inner-iteration preconditioned flexible GMRES methods for consistent linear systems, *SIAM Journal on Scientific Computing*, Volume 43, Issue 5, pp. S345–S366, June 14, 2021.  
DOI: 10.1137/20M1344937
8. Momo Matsuda, Keiichi Morikuni, Akira Imakura, Xiucai Ye, and Tetsuya Sakurai, Multiclass spectral feature scaling method for dimensionality reduction, *Intelligent Data Analysis*, Volume 24, Number 6, pp. 1273–1287, December 18, 2020.  
DOI: 10.3233/IDA-194942
9. Akira Imakura, Keiichi Morikuni, and Akitoshi Takayasu, Verified partial eigenvalue computations using contour integrals for Hermitian generalized eigenproblems, *Journal of Computational and Applied Mathematics*, Volume 369, Number 1, 11 pages, October 23 2019.  
DOI: 10.1016/j.cam.2019.112543
10. Yiran Cui, Keiichi Morikuni, Takashi Tsuchiya, and Ken Hayami, Implementation of interior-point methods for LP based on Krylov subspace iterative solvers with inner-iteration preconditioning, *Computational Optimization and Applications*, Volume 74, Number 1, pp. 143–176, June 6, 2019.  
DOI: 10.1007/s10589-019-00103-y
11. Keiichi Morikuni, Inner-iteration preconditioning with symmetric splitting matrices for symmetric singular linear systems, *Transactions of the Japan Society for Industrial and Applied Mathematics*, Volume 29, Number 1, pp. 62–77, March 25, 2019.  
DOI: 10.11540/jsiamt.29.1\_62
12. Keiichi Morikuni and Miroslav Rozložník, On GMRES for singular EP and GP systems, *SIAM Journal on Matrix Analysis and Applications*, Volume 39, Issue 2, pp. 1033–1048, June 5, 2018.  
DOI: 10.1137/17M1128216
13. Keiichi Morikuni, Iterative Methods and Preconditioners for Linear Systems with Singularity, *Bulletin of the Japan Society for Industrial and Applied Mathematics*, Volume 28, Issue 2, pp. 11–18, June 26, 2018.  
DOI: 10.11540/bjsiam.28.2\_11
14. Keiichi Morikuni, Multistep matrix splitting iteration preconditioning for singular linear systems, *Numerical Algorithms*, Volume 75, pp. 457–475, May 3, 2017.  
DOI: 10.1007/s11075-017-0330-0
15. Keiichi Morikuni and Ken Hayami, Convergence of inner-iteration GMRES methods for rank-deficient least squares problems, *SIAM Journal on Matrix Analysis and Applications*, Volume 36, Issue 1, pp. 225–250, March 4, 2015.  
DOI: 10.1137/130946009
16. Keiichi Morikuni, Lothar Reichel, and Ken Hayami, FGMRES for linear discrete ill-posed problems, *Applied Numerical Mathematics*, Volume 75, pp. 175–187, September 9, 2013.  
DOI: 10.1016/j.apnum.2013.08.004

17. Keiichi Morikuni and Ken Hayami, Inner-iteration Krylov subspace methods for least squares problems, *SIAM Journal on Matrix Analysis and Applications*, Volume 34, Issue 1, pp. 1-22, January 10, 2013 [SIAM Student Paper Prize].  
DOI: 10.1137/110828472
18. Yoshitaka Kida, Toshiya Samejima, and Keiichi Morikuni, Evaluation of a semi-analytical method for calculating multiple acoustic scattering fields, *Acoustical Science and Technology*, Volume 33, Number 1, pp. 64–67, January 1, 2012.  
DOI: 10.1250/ast.33.64

### Refereed Conference Proceedings Papers

1. Kotaro Sakamoto, Keiichi Morikuni, Tetsuya Sakurai, Sumire Matsumoto, and Kaspar Vogt, Online spectral classification for long-term spike sorting, *Proceedings of the 5th International Conference on Medical and Health Informatics*, pp. 89–97, May 14, 2021.  
DOI: 10.1145/3472813.3472830
2. Momo Matsuda, Keiichi Morikuni, and Tetsuya Sakurai, Spectral feature scaling method for supervised dimensionality reduction, *Proceedings of the Twenty-Seventh International Joint Conference on Artificial Intelligence (IJCAI-18)*, pp. 2560–2566, July 2018.  
DOI: 10.24963/ijcai.2018/355

### Book Chapter

1. Yusaku Yamamoto, Hiroto Tadano, Akira Imakura, Kensuke Aishima, Takafumi Miyata, Tetsuya Sakurai, Yoshimasa Nakamura, Keiichi Morikuni, Tomohiro Sogabe, Kengo Nakajima, Takeshi Fukaya, Yasunori Futamura, Satoshi Ohshima, *Numerical Linear Algebra : Theory and HPC*, In: Section 3.2 Iterative Methods, Chapter 3 Numerical Solutions for Least Squares Problems, Tetsuya Sakurai, Takayasu Matsuo, and Takahiro Katagiri (Eds.), Kyoritsu Shuppan Co., Ltd., Tokyo, pp. 141-158, August 2018, in Japanese.

### Non-peer-reviewed Papers

1. Keiichi Morikuni, Inner-Iteration Preconditioning for Singular Linear Systems, *RIMS Kokyuroku, Numerical Analysis: New Developments for Elucidating Interdisciplinary Problems II*, Volume 2037, pp. 44–51, July 2017.
2. Keiichi Morikuni and Ken Hayami, Inner-iteration preconditioners for least squares problems, *RIMS Kokyuroku, The Latest Developments in Theory and Application on Scientific Computation*, Volume 1791, pp. 21–30, April 2012.

### Technical Reports

1. Yi-shu Du, Ken Hayami, Ning Zheng, Keiichi Morikuni, and Jun-Feng Yin, Kaczmarz-type inner-iteration preconditioned flexible GMRES methods for consistent linear systems, *NII Technical Report, National Institute of Informatics, NII-2020-003E*.  
URL: [https://www.nii.ac.jp/TechReports/public\\_html/20-003E.html](https://www.nii.ac.jp/TechReports/public_html/20-003E.html)
2. Zeyu Liao, Ken Hayami, Keiichi Morikuni, and Jun-Feng Yin, A Stabilized GMRES Method for Solving Underdetermined Least Squares Problems, *NII Technical Report, National Institute of Informatics, NII-2020-001E*.  
URL: [https://www.nii.ac.jp/TechReports/public\\_html/20-001E.html](https://www.nii.ac.jp/TechReports/public_html/20-001E.html)
3. Keiichi Morikuni and Miroslav Rozložník, On GMRES for singular EP and GP systems, *Institute of Mathematics, Czech Academy of Sciences*, No. 23-2017, pp 1–15, May 2017.
4. Yiran Cui, Keiichi Morikuni, Takashi Tsuchiya, and Ken Hayami, Implementation of interior-point methods for LP based on Krylov subspace iterative solvers with inner-iteration preconditioning, *NII Technical Report, National Institute of Informatics, NII-2016-003E* 1-28, pp. 1–27, May 2016.  
URL: [http://www.nii.ac.jp/TechReports/public\\_html/16-003E.html](http://www.nii.ac.jp/TechReports/public_html/16-003E.html)

5. Keiichi Morikuni and Ken Hayami, Convergence of Inner-iteration GMRES Methods for Least Squares Problems (Revised Version), NII Technical Reports, National Institute of Informatics, NII-2013-004E, pp. 1–24, December 2013.  
URL: [http://www.nii.ac.jp/TechReports/public\\_html/13-004E.html](http://www.nii.ac.jp/TechReports/public_html/13-004E.html).
6. Keiichi Morikuni and Ken Hayami, Convergence of inner-iteration GMRES methods for least squares problems, NII Technical Reports, National Institute of Informatics, NII-2012-005E, pp. 1–9, August 2012  
URL: [http://www.nii.ac.jp/TechReports/public\\_html/12-005E.html](http://www.nii.ac.jp/TechReports/public_html/12-005E.html).
7. Keiichi Morikuni, Lothar Reichel, and Ken Hayami, FGMRES for linear discrete ill-posed problems, NII Technical Reports, National Institute of Informatics, NII-2012-001E, pp. 1–21, January 2012.  
URL: [http://www.nii.ac.jp/TechReports/public\\_html/12-001E.html](http://www.nii.ac.jp/TechReports/public_html/12-001E.html).
8. Keiichi Morikuni and Ken Hayami, Inner-iteration Krylov subspace methods for least squares problems, NII Technical Reports, National Institute of Informatics, NII-2011-001E, pp. 1–27, April 2011.  
URL: [http://www.nii.ac.jp/TechReports/public\\_html/11-001E.html](http://www.nii.ac.jp/TechReports/public_html/11-001E.html).

## Preprints

1. Keiichi Morikuni, Koya Sakakibara, and Asuka Takatsu, Error estimate for regularized optimal transport problems via Bregman divergence, arXiv, arXiv:2309.11666 [math.OC], pp. 1–19, September 22, 2023.
2. Akira Imakura, Keiichi Morikuni, and Akitoshi Takayasu, Complex moment-based methods for differential eigenvalue problems, arXiv, arXiv:2205.00971 [math.NA], pp. 1–25, May 2, 2022.  
DOI: 10.48550/arXiv.2205.00971
3. Akira Imakura, Keiichi Morikuni, and Akitoshi Takayasu, Verified eigenvalue and eigenvector computations using complex moments and the Rayleigh-Ritz procedure for generalized Hermitian eigenvalue problems, arXiv, 2110.01822 [math.NA], pp. 1–18, October 6, 2021.  
DOI: 10.48550/arXiv.2110.01822
4. Per Christian Hansen, Ken Hayami, and Keiichi Morikuni, GMRES Methods for Tomographic Reconstruction with an Unmatched Back Projector, arXiv, 2110.01481 [math.NA], pp. 1–25, October 5, 2021.  
DOI: 10.48550/arXiv.2110.01481
5. Kensuke Aihara, Akira Imakura, and Keiichi Morikuni, Cross-interactive residual smoothing for global and block Lanczos-type solvers for linear systems with multiple right-hand sides, arXiv, 2106.00284 [math.NA], pp. 1–20, June 1, 2021.  
DOI: 10.48550/arXiv.2106.00284
6. Keiichi Morikuni, Projection method for partial eigenproblems of linear matrix pencils, arXiv, 2007.01183 [math.NA], pp. 1–18, July 2, 2020.  
DOI: 10.48550/arXiv.2007.01183
7. Zeyu Liao, Ken Hayami, Keiichi Morikuni, and Jun-Feng Yin, A stabilized GMRES method for solving underdetermined least squares problems, arXiv, 2007.10853 [math.NA], July, 2020.  
DOI: 10.48550/arXiv.2007.10853
8. Yi-Shu Du, Ken Hayami, Ning Zheng, Keiichi Morikuni, and Jun-Feng Yin, Kaczmarz-type inner-iteration preconditioned flexible GMRES methods for consistent linear systems, arXiv, 2006.10818 [math.NA], pp 1–14, June 18, 2020.  
DOI: 10.48550/arXiv.2006.10818
9. Keiichi Morikuni, Shifted Lanczos method for quadratic forms with Hermitian matrix resolvents, arXiv, 2002.06738 [math.NA], pp. 1–16, February 18, 2020.  
DOI: 10.48550/arXiv.2002.06738
10. Akira Imakura, Keiichi Morikuni, and Akitoshi Takayasu, Verified partial eigenvalue computations using contour integrals for Hermitian generalized eigenproblems, arXiv, 1904.06277 [math.NA], pp. 1–15, September 2019.  
DOI: 10.48550/arXiv.1904.06277

11. Keiichi Morikuni, Inner-iteration preconditioning with a symmetric splitting matrix for rank-deficient least squares problems, arXiv, 1504.00889 [math.NA], pp. 1–14, May 2019.  
DOI: 10.48550/arXiv.1504.00889
12. Yiran Cui, Keiichi Morikuni, Takashi Tsuchiya, and Ken Hayami, Implementation of interior-point methods for LP based on Krylov subspace iterative solvers with inner-iteration preconditioning, arXiv, 1604.07491 [math.OC], pp. 1–30, April 2019.  
DOI: 10.48550/arXiv.1604.07491
13. Momo Matsuda, Keiichi Morikuni, and Tetsuya Sakurai, Spectral feature scaling method for supervised dimensionality reduction, arXiv, 1805.07006 [stat.ML], pp. 1–11, May 2018.  
DOI: 10.48550/arXiv.1805.07006
14. Keiichi Morikuni and Miroslav Rozložník, On GMRES for singular EP and GP systems, arXiv, 1705.03153 [math.NA], pp. 1–16, March 2018.  
DOI: 10.48550/arXiv.1705.03153
15. Keiichi Morikuni, Multistep matrix splitting iteration preconditioning for singular linear systems, arXiv, 1504.01713 [math.NA], pp. 1–16, April 2017.  
DOI: 10.48550/arXiv.1504.01713

## Honors and Awards

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1. Best presentation award at the 2023 Joint Meeting of JSIAM Activity Groups, “Cross interactive residual smoothing for improving accuracy of block Lanczos-type iterative methods”, Winner: Kensuke Aihara (co-authored by Akira Imakura and Keiichi Morikuni), June 23, 2023.
2. Best Poster Award at the 2018 JSIAM Annual Meeting, from The Japan Society for Industrial and Applied Mathematics (JSIAM), “Extension of spectral feature scaling to multiclass classification problems”, Winner: Momo Matsuda (co-authored by Keiichi Morikuni, Akira Imakura, and Tetsuya Sakurai), September 4, 2018.
3. Best Poster Award at the 2017 JSIAM Annual Meeting, from The Japan Society for Industrial and Applied Mathematics (JSIAM), “Contour integral-type verified partial eigenvalue computation using error evaluations of complex moments”, Winner: Akitoshi Takayasu (co-authored by Akira Imakura and Keiichi Morikuni), September 7, 2017.
4. Best Presentation Award for Young Researchers at the 2016 JSIAM Annual Meeting, from The Japan Society for Industrial and Applied Mathematics, “Contour integral-type methods for eigenproblems of rectangular matrix pencils”, June 30, 2017.
5. Inoue Research Award for Young Scientists, from Inoue Foundation for Science, “Inner-iteration Preconditioning for Least Squares Problems”, February 4, 2015.
6. SIAM Student Paper Prize, from Society for Industrial and Applied Mathematics, “Morikuni, K. and Hayami, K., Inner-iteration Krylov subspace methods for least squares problems, SIAM Journal on Matrix Analysis and Applications, Volume 34, Issue 1, pp. 1–22, 2013”, July 9, 2013.
7. The Graduate University for Advanced Studies Nagakura Research Incentive Award, from The Graduate University for Advanced Studies (SOKENDAI), “Inner-iteration Preconditioning for Large-scale Ill-conditioned Least Squares Problems”, March 22, 2013.
8. The Graduate University for Advanced Studies Research Award, from The Graduate University for Advanced Studies (SOKENDAI), “Inner-iteration Preconditioning for Large-scale Ill-conditioned Least Squares Problems”, March 22, 2013.
9. Best Student Award, from National Institute of Informatics (NII), March 19, 2013.

## Grants

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**April 2024–Present** Grant-in-Aid for Scientific Research (B), Grants-in-Aid for Scientific Research, Japan Society for the Promotion of Sciences, “Development of a Foundation for Numerical Operator Algebras and its Applications”, Principal Investigator: Keiichi Morikuni, 18,850,000JPY.

**April 2021–Present** Grant-in-Aid for Scientific Research (B), Grants-in-Aid for Scientific Research, Japan Society for the Promotion of Sciences, “Development of complex moment-based methods and mathematical risk avoidance techniques for infinite dimensional eigenvalue problems”, Principal Investigator: Akira Imakura, 17,030,000JPY.

**April 2020–Present** Grant-in-Aid for Early-Career Scientists, Grants-in-Aid for Scientific Research, Japan Society for the Promotion of Sciences, “Robust and efficient numerical methods for matrix problems with singularity”, Principal Investigator: Keiichi Morikuni, 4,290,000JPY.

**October 2018** Short-Term Overseas Travel Grant Program 2018, University of Tsukuba, “Convergence Analysis of Krylov Subspace Methods for Singular Systems in Finite Precision Arithmetic”, Principal Investigator: Keiichi Morikuni, 400,000JPY.

**April 2018–March 2021** Grant-in-Aid for Scientific Research (B), Grants-in-Aid for Scientific Research, Japan Society for the Promotion of Sciences, “Development of Eigenvalue Analysis Techniques Using Integral-type Eigensolvers via Nonlinear Variable Transformations”, Principal Investigator: Tetsuya Sakurai, 16,770,000JPY.

**August 2017–July 2018** Grant-in-Aid for Engineering Research, The Hattori Hokokai Foundation, Public Interest Incorporated Foundation, “Contour Integral-type Eigensolvers with Perturbation-Proofness for Rectangular Matrix Pencils”, Principal Investigator: Keiichi Morikuni, 1,000,000JPY.

**April 2016–March 2021** Grant-in-Aid for Young Scientists (B), Japan Society for the Promotion of Sciences, Grants-in-Aid for Scientific Research, “Robust and efficient solutions of large sparse constrained eigenvalue problems”, Principal Investigator: Keiichi Morikuni, 4,030,000JPY.

**June 2010–July 2010** SOKENDAI Short-stay Study Abroad Program 2010, The Graduate University for Advanced Studies, “Design and analysis of solution methods for large-scale least squares problems”, Principal Investigator: Keiichi Morikuni, 400,000JPY.

## Presentations

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\*: speaker

### Invited Talks

1. Ken Hayami\*, Per Christian Hansen, Keiichi Morikuni, GMRES Methods for Tomographic Reconstruction with an Unmatched Back Projector, The Ninth China-Russia Conference on Numerical Algebra with Applications (CRCNAA 2023), Nanton, China, July 11, 2023.
2. Keiichi Morikuni\*, Akira Imakura, A projection method for eigenvalue problems of linear nonsquare matrix pencils, RIMS Symposium: Numerical Analysis for Future Information Society: from Edge to Fugaku, Kyoto, Japan, October 14, 2022.
3. Per Christian Hansen, Ken Hayami\*, Keiichi Morikuni, GMRES Methods for Tomographic Reconstruction with an Unmatched Back Projector, 36th SIP Symposium 2021, Book of Abstracts, pp. 261–266, online, November 12, 2021.
4. Per Christian Hansen\*, Ken Hayami, Keiichi Morikuni, GMRES methods for tomographic reconstruction with an unmatched back projector, Numerical Methods and Scientific Computing (NMSC21), Marseille, France, November 10, 2021.
5. Ken Hayami\*, Zeyu Liao, Keiichi Morikuni, Jun-Feng Yin, Normal equations can be more stable than equations, Numerical Methods and Scientific Computing (NMSC21), Marseille, France, November 10, 2021.

6. Yiran Cui\*, Keiichi Morikuni\*, Takashi Tsuchiya, and Ken Hayami, Implementation of interior-point methods for LP based on Krylov subspace iterative solvers with inner-iteration preconditioning, Second Workshop on Numerical Algebra, Algorithms and Analysis, online, March 16, 2021.
7. Keiichi Morikuni\* and Rozložník, M., GMRES method for singular EP and GP linear systems, The Seventh China–Japan–Korea Joint Conference on Numerical Mathematics (CJK2018), Kanazawa, Japan, August 22, 2018.
8. Keiichi Morikuni\*, Contour integral methods for partial eigenvalue problems of linear matrix pencils, Iwate Mathematical Sciences Seminar, Iwate, Japan, July 31, 2018.
9. Keiichi Morikuni\*, Inner-iteration preconditioning for singular linear systems, Numerical Analysis: New Developments for Elucidating Interdisciplinary Problems II, Kyoto, Japan, October 21, 2016.
10. Keiichi Morikuni\*, Inner-iteration preconditioning for least squares problems and its applications, Numerical Analysis Seminar at The University of Tokyo (UTNAS), Tokyo, Japan, May 23, 2016.
11. Keiichi Morikuni\*, Application of inner-iteration preconditioning to general least squares problems, JSIAM Annual Meeting 2015, Organized Session of Young Researchers Group, Kanazawa, Japan, September 9, 2015.
12. Lu Liu, Keiichi Morikuni, Ken Hayami\*, and Jun-Feng Yin, AOR Inner-Iteration GMRES Method for Least Squares Problems, Workshop on Structured Preconditioning and Iterative Methods with Applications, Sanya, China, March 25, 2014.
13. Ken Hayami\*, Keiichi Morikuni, and Ning Zheng\*, Fast solution methods for least squares problems and their applications, National Institutes of Natural Sciences (NINS) Workshop on Inverse Problems and Imaging, Japan, January 7, 2014.
14. Keiichi Morikuni\* and Ken Hayami, Inner-iteration preconditioning for minimum-norm solution, Annual Meeting of the Activity Group on Young Researchers 2015, The Japan Society for Industrial and Applied Mathematics, Tokyo, Japan, December 25, 2013.
15. Keiichi Morikuni\* and Ken Hayami, Inner-iteration preconditioning for rank-deficient linear systems, Second Workshop on Mathematical Science, Gifu, Japan, September 17, 2013.
16. Keiichi Morikuni\* and Ken Hayami, Inner-iteration Krylov Subspace Methods for Least Squares Problems, SIAM Student Paper Prize Winners Presentation session, 2013 SIAM Annual Meeting, San Diego, California, United States, July 10, 2013.
17. Keiichi Morikuni and Ken Hayami\*, Inner-iteration GMRES methods for least squares problems, 3rd Dolomites Workshop on Constructive Approximation and Applications (DWCAA12), Trento, Italy, Book of Abstracts, p. 39, September 11, 2012.
18. Keiichi Morikuni\* and Ken Hayami, GMRES methods with inner-iteration preconditioning for large least squares problems, Numerical Analysis Seminar at The University of Tokyo (UTNAS), Tokyo, Japan, July 31, 2012.
19. Keiichi Morikuni and Ken Hayami\*, Inner-Iteration Preconditioning for Least Squares Problems, International Workshop on Computational Science and Numerical Analysis, Tokyo, Japan, March 26, 2012.
20. Keiichi Morikuni\*, Yosuke Hosoda, and Ken Hayami, Improvements of ART and Krylov subspace methods for inverse problems in image reconstruction in electron microscopy, Imaging Science Symposium, Bioimaging Forum, Aichi, Japan, March 5, 2012.
21. Keiichi Morikuni\* and Ken Hayami, Inner-iteration preconditioners for least squares problems, The Latest Developments in Theory and Application on Scientific Computation, Research Institute for Mathematical Sciences, Kyoto University, Kyoto, Japan, October 2011, Program and Abstract, pp. 7–9.
22. Keiichi Morikuni\* and Ken Hayami, Preconditioned GMRES using inner iterations for underdetermined least squares problems, International Workshop on Numerical Linear Algebra and its Applications (20th NLA Seminar), Tongji University, Shanghai, China, July 1, 2011.

23. Keiichi Morikuni and Ken Hayami\*, Inner Iteration Preconditioners for Least Squares Problems, – Overdetermined, Underdetermined, and Rank-Deficient Cases–, Workshop on Matrix Equations and Tensor Computations, Hunan, China, April 2011.
24. Keiichi Morikuni and Ken Hayami\*, Inner-iteration preconditioners for least squares problems, The Third International Conference on Numerical Algebra and Scientific Computing (NASC10), Chinese Academy of Sciences, Beijing, China, October 23, 2010, Program and Abstracts, p. 8.
25. Ken Hayami\* and Keiichi Morikuni, Inner-iteration preconditioners for least squares problems, Applied Mathematics International Conference 2010 (AMIC 2010) and the 6th East Asia SIAM Conference 2010 (EASIAM), Kuala Lumpur, Malaysia, June 2010, Program and Abstracts, p. 9.

## Contributed Talks

1. Kensuke Aihara\*, Akira Imakura, Keiichi Morikuni, Cross-interactive residual smoothing for block Lanczos-type methods for solving linear systems with multiple right-hand sides, Minisymposium on the Stability of Numerical Linear Algebra Algorithms, 10th International Congress on Industrial and Applied Mathematics (ICIAM23), Tokyo, Japan, August 24, 2023.
2. Keiichi Morikuni\*, Akira Imakura, A projection method for singular eigenvalue problems of linear matrix pencils, Minisymposium on the Stability of Numerical Linear Algebra Algorithms, 10th International Congress on Industrial and Applied Mathematics (ICIAM23), Tokyo, Japan, August 23, 2023.
3. Ken Hayami\*, Per Christian Hansen, Keiichi Morikuni, GMRES methods for tomographic reconstruction with an unmatched back projector, Minisymposium on the Recent Developments on the Numerical Solution of Least Squares Problems, 10th International Congress on Industrial and Applied Mathematics, Tokyo, Japan, August 21, 2023.
4. Keiichi Morikuni, A projection method for eigenvalue problems of linear nonsquare matrix pencils, Functional Analysis, Approximation Theory and Numerical Analysis, Matera, Italy, July 7, 2022.
5. Ken Hayami\*, Per Christian Hansen, and Keiichi Morikuni, GMRES methods for tomographic reconstruction with an unmatched back projector, 18th Joint Meeting of JSIAM Activity Groups, The Japan Society for Industrial and Applied Mathematics, online, March 9, 2022.
6. Yiran Cui, Keiichi Morikuni\*, Takashi Tsuchiya, and Ken Hayami, Implementation of interior-point methods for LP using Krylov methods preconditioned by inner iterations, Workshop on Continuous Optimization and Related Topics, online, November 27, 2021.
7. Ken Hayami\*, Zeyu Liao, Keiichi Morikuni, and Jun-Feng Yin, Analysis of the stabilized GMRES method, JSIAM Annual Meeting 2021, September 9, 2021, online, Book of Abstracts, pp. 390–391.
8. Keiichi Morikuni\*, Projection method for eigenproblems of linear nonsquare matrix pencils, JSIAM Annual Meeting 2021, September 9, 2021, online, Book of Abstracts pp. 384-385.
9. Yiran Cui, Keiichi Morikuni, Takashi Tsuchiya, and Ken Hayami\*, Implementation of interior-point methods for LP based on Krylov subspace iterative solvers with inner-iteration preconditioning, The 22nd Conference of the International Federation of Operational Research Societies (IFORS 2021), August 26, 2021, online.
10. Per Christian Hansen\*, Ken Hayami, and Keiichi Morikuni, GMRES Methods for Tomographic Reconstruction with an Unmatched Back Projector, SIAM Conference on Applied Linear Algebra (LA21), online, May 20, 2021.
11. Kensuke Aihara\*, Akira Imakura, and Keiichi Morikuni, On the Residual Gap of Block Lanczos-Type Methods and Its Remedy by Cross-Interactive Residual Smoothing, SIAM Conference on Applied Linear Algebra (LA21), online, May 20, 2021.
12. Yi-Shu Du\*, Ken Hayami, Ning Zheng, Keiichi Morikuni, and Jun-Feng Yin, Kaczmarz-Type Inner-Iteration Preconditioned Flexible GMRES Methods for Consistent Linear Systems, SIAM Conference on Applied Linear Algebra (LA21), online, May 19, 2021.

13. Akira Imakura\*, Keiichi Morikuni, and Akitoshi Takayasu, Complex Moment-Based Methods for Differential Eigenvalue Problems, SIAM Conference on Applied Linear Algebra (LA21), online, May 18, 2021.
14. Akira Imakura, Keiichi Morikuni\*, and Akitoshi Takayasu, Verifying eigenvalues of generalized Hermitian eigenproblems using contour integrals, Second Workshop on Numerical Algebra, Algorithms and Analysis, online, March 16, 2021.
15. Akira Imakura\*, Kensuke Aihara, and Keiichi Morikuni, Block generalized CGS method for linear systems with multiple right-hand sides, 17th Joint Meeting of JSIAM Activity Groups, The Japan Society for Industrial and Applied Mathematics, online, March 4, 2021.
16. Kensuke Aihara\*, Akira Imakura, and Keiichi Morikuni, Residual gap evaluation of global Krylov subspace methods for Sylvester equations and their improvements, 17th Joint Meeting of JSIAM Activity Groups, online, The Japan Society for Industrial and Applied Mathematics, online, March 4, 2021.
17. Kensuke Aihara\*, Akira Imakura, and Keiichi Morikuni, Block Krylov subspace methods and residual smoothing focusing on recursions, 30th Meeting of the Activity Group on Algorithms for Matrix/Eigenvalue Problems and their Applications, The Japan Society for Industrial and Applied Mathematics, online, December 7, 2020.
18. Keiichi Morikuni\*, Shifted Lanczos method for quadratic forms of Hermite matrix resolvents, 16th Joint Meeting of JSIAM Activity Groups, The Japan Society for Industrial and Applied Mathematics, Tokyo, Japan, March 4, 2020.
19. Keiichi Morikuni\*, Shifted Lanczos method for bilinear forms of symmetric matrix resolvents, 28th Meeting of the Activity Group on Algorithms for Matrix/Eigenvalue Problems and their Applications, The Japan Society for Industrial and Applied Mathematics, Tokyo, Japan, December 2, 2019.
20. Miroslav Rozložník\* and Keiichi Morikuni, On GMRES for linear EP and GP systems, International Congress on Industrial and Applied Mathematics (ICIAM2019), Valencia, Spain, July 19, 2019.
21. Akira Imakura, Keiichi Morikuni\*, and Akitoshi Takayasu, Improvement of a verification method for the partial eigenvalue computation of generalized Hermitian eigenvalue problems based on contour integrals, 15th Joint Meeting of JSIAM Activity Groups, The Japan Society for Industrial and Applied Mathematics, Tsukuba, Japan, March 4, 2019.
22. Miroslav Rozložník\* and Keiichi Morikuni, Numerical behavior of GMRES for singular systems, 90th GAMM Annual Meeting, Vienna, Austria, February 20, 2019.
23. Keiichi Morikuni and Miroslav Rozložník\*, On GMRES for linear EP and GP systems, GAMM Applied Numerical Linear Algebra (ANLA) Workshop, Lund, Sweden, October 11, 2018.
24. Yiran Cui, Keiichi Morikuni, Takashi Tsuchiya, and Ken Hayami, Implementation of Interior-point Methods for LP without a Direct Linear Equation Solver, The 3rd IMI-ISM-ZIB MODAL Workshop on Challenging in Real World Data Analytics and High-Performance Optimization, Tokyo, Japan, September 27, 2018.
25. Akitoshi Takayasu\*, Akira Imakura, and Keiichi Morikuni, Verified computing for partial eigenvalues using a contour integral-type eigensolver, 18th International Symposium on Scientific Computing, Computer Arithmetic, and Verified Numerical Computations, Tokyo, Japan, September 12, 2018.
26. Momo Matsuda\*, Keiichi Morikuni, Tetsuya Sakurai, Spectral Feature Scaling Method for Supervised Dimensionality Reduction, Twenty-Seventh International Joint Conference on Artificial Intelligence (IJCAI-18), Stockholm, Sweden, July 19, 2018.
27. Momo Matsuda\*, Keiichi Morikuni, Akira Imakura, Tetsuya Sakurai, Spectral Feature Scaling Method for Multiclass Classification Problems, 47th Numerical Analysis Symposium (NAS2018), Japan, Book of Abstracts, pp. 31–34, Jun 7, 2018.

28. Akira Imakura, Keiichi Morikuni, Akitoshi Takayasu, Verified Partial Eigenvalue Computation for Generalized Hermitian Eigenproblems Using Contour Integrals, The 47th Numerical Analysis Symposium (NAS2018), Japan, Book of Abstracts, pp. 1–4, June 6, 2018.
29. Keiichi Morikuni, Contour integral methods for partial eigenproblems of linear rectangular matrix pencils, SIAM Conference on Applied Linear Algebra (SIAM-ALA18), Hong Kong, May 8, 2018.
30. Keiichi Morikuni and Miroslav Rozložník, On GMRES for singular EP and GP systems, 89th GAMM Annual Meeting, Munich, Germany, March 20, 2018.
31. Keiichi Morikuni, Contour integral methods for rectangular eigenproblems, 21st Conference of the International Linear Algebra Society, Ames, Iowa, United States July 27, 2017.
32. Akira Imakura\*, Keiichi Morikuni, and Akitoshi Takayasu, Verified computation of partial eigenvalues of a real symmetric matrix using contour integration, 46th Numerical Analysis Symposium (NAS2017), June 30, 2017, Book of Abstracts, pp.115–118.
33. Momo Matsuda\*, Keiichi Morikuni, and Tetsuya Sakurai, Supervised spectral clustering using feature scaling, 46th Numerical Analysis Symposium (NAS2017), Shiga, Japan, June 29, 2017, Book of Abstracts, pp. 51–54.
34. Keiichi Morikuni\* and Miroslav Rozložník, GMRES method for singular linear systems, 46th Numerical Analysis Symposium (NAS2017), Book of Abstracts, pp. 17–20, June 30, 2017.
35. Keiichi Morikuni\*, Inner-Iteration Preconditioning for the Minimum-Norm Solutions to Least Squares Problems, MS33 Sparse Least Squares, SIAM Conference on Computational Science and Engineering, Atlanta, United States, February 27, 2017.
36. Keiichi Morikuni\*, GMRES method for singular linear systems, Workshop on Numerical Methods for Matrix Computations (NMMC2017), Nagoya, Japan, January 20, 2017.
37. Keiichi Morikuni\*, Contour integral-type solution of eigenvalue problems of rectangular matrix pencils, OS Algorithms for Matrix/Eigenvalue Problems and their Applications (3), JSIAM Annual Meeting 2016, Fukuoka, Japan, September 13, 2016, Proceedings of the 2016 JSIAM Annual Meeting, pp. 352–353.
38. Yiran Cui\*, Keiichi Morikuni, Takashi Tsuchiya, and Ken Hayami, Implementation of Interior-point Methods for LP Based on Krylov Subspace Iterative Solvers with Inner-Iteration Preconditioning, 5th IMA Conference on Numerical Linear Algebra and Optimization, Birmingham, UK, September 7, 2016.
39. Yiran Cui, Keiichi Morikuni\*, Takashi Tsuchiya, and Ken Hayami, Implementation of Interior-point Methods for LP using Krylov Subspace Methods Preconditioned by Inner Iterations, Workshop on Advances in Optimization (WAO), Tokyo, August 13, 2016, Book of Abstracts, pp. 24–26.
40. Yiran Cui, Keiichi Morikuni\*, Takashi Tsuchiya, and Ken Hayami, Implementation of Interior-point Methods for LP Using Krylov Subspace Methods Preconditioned by Inner Iterations, Various Aspects of Conic Optimization and Mathematical Modeling Systems Session, The Fifth International Conference on Continuous Optimization of the Mathematical Optimization Society (ICCOPT), Tokyo, Japan, August 8, 2016, Program and Abstracts, p. 47.
41. Keiichi Morikuni\*, Application of inner-iteration preconditioning to general least squares problems, Recent Advances in the Solution of Least Squares Problems, 20th Conference of the International Linear Algebra Society (ILAS), Leuven, Belgium, July 15, 2016.
42. Keiichi Morikuni\*, Rayleigh-Ritz-type contour integral-based eigensolvers for eigenvalue problems of rectangular matrix pencils, 45th Numerical Analysis Symposium (NAS2016), Kagoshima, Japan, June 8, 2016, Book of Abstracts, pp.1–4.
43. Yiran Cui, Keiichi Morikuni\*, Takashi Tsuchiya, and Ken Hayami, Implementation of interior-point method for LP based on Krylov subspace iterative solver with inner-iteration preconditioning, Workshop ‘Optimization: Modelling and Algorithms’, Tokyo, Japan, March 22, 2016.

44. Yiran Cui\*, Keiichi Morikuni, Takashi Tsuchiya, and Ken Hayami, Inner-iteration Preconditioning of Normal Equations in an Interior-point Method for LP, Solution of Matrix and Eigenvalue Problems and Applications, 12th Joint Meeting of JSIAM Activity Groups, Kobe, Japan, March 4, 2016.
45. Keiichi Morikuni\*, Symmetric inner-iteration preconditioning for rank-deficient least squares problems, SIAM Conference on Applied Linear Algebra, Atlanta, United States, October 29, 2015.
46. Keiichi Morikuni\* and Ken Hayami, Application of inner-iteration preconditioning to general least squares problems, Recent Advances in the Solution of Least Squares Problems 1, International Congress on Industrial and Applied Mathematics 2015 (ICIAM 2015), Beijing, China, August 11, 2015.
47. Yiran Cui\*, Keiichi Morikuni, Takashi Tsuchiya, and Ken Hayami, Application of Inner-Iteration Krylov Subspace Methods to Interior-Point Methods for Linear Programs, WB04 Advances and Applications in Conic Optimization Part II, 22nd International Symposium on Mathematical Programming (ISMP 2015), Pittsburgh, United States, July 15, 2015.
48. Keiichi Morikuni\*, Application of inner-iteration preconditioning to singular linear systems, International Conference on Preconditioning Techniques for Scientific and Industrial Applications, Eindhoven, Netherlands, June 18, 2015.
49. Keiichi Morikuni\*, Inner-iteration preconditioning for singular linear systems, 44th Numerical Analysis Symposium, Yamanashi, Japan, June 9, 2015, Book of Abstracts, pp. 57-60.
50. Keiichi Morikuni\*, Ken Hayami, and Miroslav Rozložník, Krylov Subspace Methods Preconditioned by Inner Iterations for Rank-deficient Least Squares Problems, MS275 Preconditioners for Sparse Least Squares, SIAM Conference on Computational Science and Engineering, Utah, United States, March 18, 2015.
51. Keiichi Morikuni\* and Miroslav Rozložník, Application of Inner-iteration Preconditioning to General Least Squares Problems, Lecture on Numerical Linear Algebra, Tokyo, Japan, February 3, 2015.
52. Keiichi Morikuni\* and Miroslav Rozložník, Inner-iteration preconditioning for singular linear systems, Lecture on Numerical Linear Algebra, Tokyo, Japan, November 4, 2014.
53. Keiichi Morikuni\*, Miroslav Rozložník, and Ken Hayami, Inner-iteration preconditioning for CG and MINRES-type methods, The Fifth International Conference on Numerical Algebra and Scientific Computing (NASC 2014), Shanghai, China, October 28, 2014.
54. Keiichi Morikuni\* and Ken Hayami, Inner-iteration preconditioners for the minimum-norm solution of rank-deficient systems, International Conference on Preconditioning Techniques for Scientific and Industrial Applications, Oxford, UK, June 19, 2013.
55. Keiichi Morikuni\* and Ken Hayami, Inner-iteration preconditioning for the minimum-norm solution of rank-deficient linear systems, Minisymposium Linear Least Squares Methods: Algorithm, Analysis, and Applications, 18th Conference of the International Linear Algebra Society (ILAS), Rhode Island, United States, June 3, 2013, Book of Abstracts, p. 53.
56. Keiichi Morikuni\* and Ken Hayami, GMRES methods with inner iterations for least squares problems, The Fourth International Conference on Numerical Algebra and Scientific Computing (NASC 2012), Dalian, China, October 20, 2012, Program and Abstracts, pp. 18-19.
57. Keiichi Morikuni\*, Yosuke Hosoda, and Ken Hayami, Inverse problems arising from image reconstruction in electron microscopes, Technical Meeting on Electronics, Information and Systems [Division C], The Institute of Electrical Engineering of Japan, Japan, September 6, 2012, Book of Abstracts, pp. 931-933.
58. Keiichi Morikuni\* and Ken Hayami, GMRES methods preconditioned with inner iterations for general least squares problems, JSIAM Annual Meeting, Hokkaido, Japan, August 29, 2012, Proceedings of the 2012 JSIAM Annual Meeting, pp. 91-92.

59. Roy Nawar\*, Ken Hayami, and Keiichi Morikuni, Inner iterations for generalized minimal residual (GMRES) methods with numerical performance, JSIAM Annual Meeting, Hokkaido, Japan, August 29, 2012, Proceedings of the 2012 JSIAM Annual Meeting, pp. 93–94.
60. Keiichi Morikuni\* and Ken Hayami, SOR inner-iteration GMRES for underdetermined least squares problems, Minisymposia MS 34, Least squares methods and applications, 2012 SIAM Conference on Applied Linear Algebra, Polytechnic University of Valencia, Valencia, Spain, June 2012.
61. Keiichi Morikuni\* and Ken Hayami, Stationary inner-iteration preconditioned GMRES method for least squares problems, Twelfth Copper Mountain Conference in Iterative Methods, Colorado, United States, March 2012.
62. Keiichi Morikuni and Ken Hayami\*, Inner-iteration GMRES methods for underdetermined least squares problems, International Conference on Scientific Computing (SC2011), Special session: Iterative Methods for Linear Systems, Italy, October 2011.
63. Keiichi Morikuni\* and Ken Hayami, Inner-iteration CG and GMRES methods for least squares problems, Mini-Symposium MS312, The Iterative Solution of Least Squares Problems, 7th International Congress on Industrial and Applied Mathematics (ICIAM 2011), Vancouver, Canada, July 2011.
64. Keiichi Morikuni and Ken Hayami, Inner-Iteration Preconditioners for Least Squares Problems, Foundations of Computational Mathematics (FoCM), Budapest, Hungary, July 8, 2011.
65. Keiichi Morikuni\* and Ken Hayami, Inner-iteration preconditioned GMRES for underdetermined least squares problems, The 40th Numerical Analysis Symposium, Japan, June 22, 2011, Book of Abstracts, pp. 121–124.
66. Keiichi Morikuni\* and Ken Hayami, Inner-iteration GMRES methods for underdetermined least squares problems, 10th IMACS International Symposium on Iterative Methods in Scientific Computing, Marrakesh, Morocco, May 2011, Program and Abstracts, p. 59.
67. Keiichi Morikuni\* and Ken Hayami, Iterative preconditioners for least squares problems, 15th International Congress on Computational and Applied Mathematics (ICCAM 2010), Leuven, Belgium, July 6, 2010, Program and Abstracts, p. 79.
68. Toshiya Samejima\*, Yoshitaka Kida, and Keiichi Morikuni, Semi-analytical calculation methods for multiple acoustic scattering by arbitrary obstacles, The 54th Annual Conference of the Institute of Systems, Control and Information Engineers, Kyoto, Japan, May 2010.
69. Yoshitaka Kida\*, Toshiya Samejima, and Keiichi Morikuni, Evaluation of semi-analytic method for multiple acoustic scattering field analysis, The 2010 Spring Meeting of the Acoustical Society of Japan, Tokyo, Japan, March 2010, Book of Abstracts, p. 2-4-12.
70. Keiichi Morikuni\*, Xiaoke Cui., and Ken Hayami, Preconditioning Krylov subspace methods using inner iterations for least squares problems, GAMM Workshop Applied and Numerical Linear Algebra: Preconditioning, Zurich, Switzerland, September 11, 2009.
71. Keiichi Morikuni\*, Xiaoke Cui, and Ken Hayami, Preconditioning Krylov subspace methods using inner-iterations for least squares problems, Annual Meeting of the Japan Society for Industrial and Applied Mathematics, Osaka, Japan, September 2009, Proceedings of the 2009 JSIAM Annual Meeting, pp. 173–174.
72. Keiichi Morikuni\*, Xiaoke Cui, and Ken Hayami, Preconditioning with inner iterations for least squares problems, The 38th Numerical Analysis Symposium, Japan, June 2009, Book of Abstracts, pp. 41–44.
73. Keiichi Morikuni\*, Xiaoke Cui, and Ken Hayami, Preconditioning with column decomposed AOR methods for least squares problems, Joint Meeting of JSIAM Activity Groups 2009, March 2009.

74. Keiichi Morikuni\*, Toshiya Samejima, and Masato Kashida, Analysis of acoustic scattering from multiple obstacles with arbitrary boundary conditions, Autumn Meeting of the Acoustic Society of Japan, Japan, September 2008, Book of Abstracts, p. 1-6-10.
75. Keiichi Morikuni\* and Ken Hayami, Experiments on column decomposed AOR method for least squares problems, Annual Meeting of JSIAM, Tokyo, Japan, September 2008, Proceedings of the 2008 JSIAM Annual Meeting, pp. 431–432.

## Poster Presentations

1. Keiichi Morikuni\*, Time series motif discovery in matrix profiles via low-rank approximation, Annual Meeting of JSIAM, Tokyo, Japan, September 4, 2019.
2. Sumire Matsumoto\*, Keiichi Morikuni, Momo Matsuda, Kotaro Sakamoto, Kaoru Ohyama, Vogt, Kasper Tetsuya Sakurai, Semi-automatic spike sorting of long-term tetrode recording in mice, The 42th Annual Meeting of the Japan Neuroscience Society, Niigata, Japan, September 6, 2019.
3. Kaoru Ohyama\*, Keiichi Morikuni, Sumire Matsumoto, Momo Matsuda, Yuichi Makino, Thomas J. McHugh, Tetsuya Sakurai, Masashi Yanagisawa, Robert W. Greene, and Kaspar E. Vogt, Network organization of cortical neurons across waking and sleep in naturally behaving mice, The 42th Annual Meeting of the Japan Neuroscience Society, Kobe, Japan, July 26, 2018.
4. Keiichi Morikuni\*, Inner-iteration preconditioning for singular linear systems, Householder Symposium XX on Numerical Linear Algebra, July 21, 2017, Program and Abstracts, pp. 230–232.
5. Shunya Ueta\*, Tetsuya Sakurai, and Keiichi Morikuni, Semi-supervised learning using a contour integral-based eigensolver for image segmentation, Machine Learning Summer School 2015, Kyoto, Japan, August 2015.
6. Keiichi Morikuni\* and Ken Hayami, Inner iteration preconditioning for least squares problems, Annual Meeting of the Japan Society for Industrial and Applied Mathematics, Tokyo, Japan, September 2010.
7. Keiichi Morikuni\*, Tetsuya Samejima, and Makoto Kashida, Analysis of acoustic scattering from multiple obstacles with arbitrary boundary conditions, The 37th Numerical Analysis Symposium (NAS2008), Japan, June 2008.

## Professional Activity

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### Editorial Boards

**January 2024–Present** Editor, Japan Journal of Industrial and Applied Mathematics.

**April 2021–Present** Editor, Transactions of the Japan Society for Industrial and Applied Mathematics.

**April 2018–March 2022** Associate Editor, JSIAM Letters.

**April 2018–March 2021** Editor, Bulletin of the Japan Society for Industrial and Applied Mathematics.

### Society Activities

**April 2018–March 2024** Secretary, Activity Group on Algorithms for Matrix/Eigenvalue Problems and their Applications, The Japan Society for Industrial and Applied Mathematics (JSIAM).

**April 2021–March 2023** Chair, Activity Group on Algorithms for Matrix/Eigenvalue Problems and their Applications, The Japan Society for Industrial and Applied Mathematics (JSIAM).

**April 2022–March 2023** Representative Member, The Japan Society for Industrial and Applied Mathematics (JSIAM).

## Organizing Committees

**August 2023** Local Scientific Program Committee, International Congress on Industrial and Applied Mathematics (ICIAM2023), Tokyo, Japan.

**November 2021** Organizer, Workshop on Continuous Optimization and Related Topics, online.

**March 2021** Organizing Committee, Second Workshop on Numerical Algebra, Algorithms, and Analysis, online.

**March 2018** Local Chair, Organizing Committee, International Workshop on Eigenvalue Problems (EPASA2018), Tsukuba, Japan.

**June 2018** Executive Committee, Numerical Analysis Symposium 2018, Fukui, Japan.

**June 2017** Executive Committee, Numerical Analysis Symposium 2017, Shiga, Japan.

**January 2016** Organizing Committee, Workshop on Numerical Algebra, Algorithms, and Analysis, Tokyo, Japan.

**November 2015** Executive Committee Member, Association for Computing Machinery (ACM) International Collegiate Programming Contest 2015 Asia Region, Tsukuba, Japan.

**March 2009–April 2009** World Student Organizing Committee Member, Education Without Border 2009, Dubai, United Arab Emirates.

## Open Source Codes

1. Keiichi Morikuni, MATLAB codes for a projection method for eigenvalue problems of linear nonsquare matrix pencils.  
URL: [https://github.com/morikuni-keiichi/proj\\_nonsq/](https://github.com/morikuni-keiichi/proj_nonsq/)
2. Yiran Cui, Keiichi Morikuni, Takashi Tsuchiya, and Ken Hayami, NIILP: Linear Program Solver.  
URL: <https://github.com/cuiyiran/NIILP/>
3. Keiichi Morikuni and Ken Hayami, C codes for the BA-GMRES method preconditioned by the NR-SOR inner iterations.  
URL: [https://github.com/morikuni-keiichi/BA-NRSOR\\_C/](https://github.com/morikuni-keiichi/BA-NRSOR_C/)
4. Keiichi Morikuni and Ken Hayami, Fortran codes for the AB-GMRES method preconditioned by the NE-SOR inner iterations.  
URL: [https://github.com/morikuni-keiichi/AB-NESOR\\_F90/](https://github.com/morikuni-keiichi/AB-NESOR_F90/)
5. Keiichi Morikuni and Ken Hayami, Fortran codes for the BA-GMRES method preconditioned by the NR-SOR inner iterations.  
URL: [https://github.com/morikuni-keiichi/BA-NRSOR\\_F90/](https://github.com/morikuni-keiichi/BA-NRSOR_F90/)
6. Keiichi Morikuni and Ken Hayami, Matlab-MEX codes in C for the AB-GMRES method preconditioned by the NE-SOR inner iterations.  
URL: [https://github.com/morikuni-keiichi/AB-NESOR\\_MEX/](https://github.com/morikuni-keiichi/AB-NESOR_MEX/)
7. Keiichi Morikuni and Ken Hayami, Matlab-MEX codes in C for the BA-GMRES method preconditioned by the NR-SOR inner iterations.  
URL: [https://github.com/morikuni-keiichi/BA-NRSOR\\_MEX/](https://github.com/morikuni-keiichi/BA-NRSOR_MEX/)
8. Ken Hayami, Keiichi Morikuni, Xiaoke Cui, Jun-Feng Yin, Tokushi Ito, Benoit Goepfert, Michael Baudin, Splspc: Sparse Least Squares Preconditioned methods (Scilab Toolbox).  
URL: <https://atoms.scilab.org/toolboxes/splspc/>  
URL: <https://forge.scilab.org/index.php/p/splspc/>

## Academic Visits

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**October 2018** Professor Miroslav Rozložník, Institute of Mathematics, Czech Academy of Sciences, Prague, Czech Republic, 1 week.

**June 2012** Professors Zdeněk Strakoš and Miroslav Tůma, Doctors Miroslav Rozložník and Petr Tichý, Institute of Computer Science, Czech Academy of Sciences, Prague, Czech Republic, 1 week.

**April 2012** Professors Michele Benzi and James Nagy, Emory University, Atlanta, United States, 1 week.

**September–October 2010** Professor Zhong-Zhi Bai, State Key Laboratory of Scientific and Engineering Computing, Chinese Academy of Sciences, Beijing, China, 1 month.

**June 2010–July 2010** Professor Rafael Bru and Professor Jose Mas, Universidad Politécnica de Valencia, Valencia, Spain, 1 week.

**March–April 2010** Professor Zhong-Zhi Bai, State Key Laboratory of Scientific and Engineering Computing, Chinese Academy of Sciences, Beijing, China, 1 month.

**September 2009** Professor Michael Eiermann, Technische Universität Bergakademie Freiberg, Freiberg, Germany, 1 week.

**April 2009–May 2009** Professor Zhong-Zhi Bai, State Key Laboratory of Scientific and Engineering Computing, Chinese Academy of Sciences, Beijing, China, 1 month.

## Teaching

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**2020–Present** Basic Experiments in Human Biology (for first year graduate, Ph.D. Program in Human Biology, University of Tsukuba).

**2020–Present** Computational Biology (for first year graduate, Master's/Doctoral Program in Life Science Innovation, University of Tsukuba)

**2019–Present** Linear Algebra A (for first year undergraduate, Collage of Information Science, School of Informatics, University of Tsukuba).

**2019–Present** Information Literacy (for first year undergraduate, University of Tsukuba).

**2016–present** Computational Algorithms and Simulation (for third year undergraduate, Collage of Information Science, School of Informatics, University of Tsukuba).

**2015–Present** Basic Computational Biology (for first year graduate, Department of Computer Science, Graduate School of Systems and Information Engineerin; Ph.D. Program in Human Biology; Ph.D. Program in Humanics; University of Tsukuba).

**2018** Linear Algebra I (for first year undergraduate, Collage of Information Science, School of Informatics, University of Tsukuba).

**2015** Computational Algorithms (for third year undergraduate, Collage of Information Science, School of Informatics, University of Tsukuba).