Takafumi Sasaki — *Curriculum Vitae*

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JSPS Research Fellow (PD)
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Education

B.Eng. Engineering, Waseda University, March 2014

M.Eng. Engineering, Waseda University, March 2016

Ph.D. Engineering, Waseda University, March 2019

Honors and Awards

Graduate Program for Embodiment Informatics, Waseda University Program for Leading Graduate Schools, April 2014–March 2019

Outstanding Final Presentation, English for Science and Technology Program in U.C. Davis (2014)

Outstanding Presentation Award, The 18th International Conference on Finite Elements in Flow Problems (2015)

Visualization Award for Outstanding Performance, The 22nd Japan Society for Computational Engineering and Science Conference (2016) (H. Uchikawa, T. Sasaki, T. Terahara, K. Takizawa and T.E. Tezduyar)

Early Bird Young Scientists' Community 2017, Waseda Research Institute for Science and Engineering (2017)

Certificate of Merit for Best Presentation, JSME Computational Mechanics Division (2017)

Research Fellowship for Young Scientists (DC2) Japan Society for the Promotion of Science, April 2018 – March 2020

Publications Summary

6	ISI-Indexed Journal Articles	3	Chapters in Books
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Publications

Journal Articles Indexed by the Web of Science

1 K. Takizawa, T.E. Tezduyar, and **T. Sasaki**, "Aorta modeling with the element-based zero-stress state and isogeometric discretization", *Computational Mechanics*, **59** (2017) 265–280, doi: 10.1007/s00466-016-1344-5.

2 K. Takizawa, T.E. Tezduyar, T. Terahara, and **T. Sasaki**, "Heart valve flow computation with the integrated Space–Time VMS, Slip Interface, Topology Change and Isogeometric Discretization methods", *Computers & Fluids*, **158** (2017) 176–188, doi: 10.1016/j.compfluid.2016.11.012.

3 K. Takizawa, T.E. Tezduyar, H. Uchikawa, T. Terahara, **T. Sasaki**, and A. Yoshida, "Mesh refinement influence and cardiac-cycle flow periodicity in aorta flow analysis with isogeometric discretization", *Computers & Fluids*, published online, DOI: 10.1016/j.compfluid.2018.05.025, May 2018, doi: 10.1016/j.compfluid.2018.05.025.

4 K. Takizawa, T.E. Tezduyar, and **T. Sasaki**, "Isogeometric hyperelastic shell analysis with out-of-plane deformation mapping", *Computational Mechanics*, **63** (2019) 681–700, doi: 10.1007/s00466-018-1616-3.

5 **T. Sasaki**, K. Takizawa, and T.E. Tezduyar, "Aorta zero-stress state modeling with T-spline discretization", *Computational Mechanics*, published online, DOI: 10.1007/s00466-018-1651-0, November 2018, doi: 10.1007/s00466-018-1651-0.

6 **T. Sasaki**, K. Takizawa, and T.E. Tezduyar, "Medical-image-based aorta modeling with zero-stress-state estimation", *Computational Mechanics*, published online, DOI: 10.1007/s00466-019-01669-4, February 2019, doi: 10.1007/s00466-019-01669-4.

Chapters in Books

1 K. Takizawa, T.E. Tezduyar, and **T. Sasaki**, "Estimation of element-based zero-stress state in arterial FSI computations with isogeometric wall discretization", in P. Wriggers and T. Lenarz, editors, *Biomedical Technology: Modeling, Experiments and Simulation*, Lecture Notes in Applied and Computational Mechanics, 101–122, Springer, 2018, ISBN 978-3-319-59547-4, doi: 10.1007/978-3-319-59548-1_7.

2 K. Takizawa, T.E. Tezduyar, T. Terahara, and **T. Sasaki**, "Heart valve flow computation with the Space–Time Slip Interface Topology Change (ST-SI-TC) method and Isogeometric Analysis (IGA)", in P. Wriggers and T. Lenarz, editors, *Biomedical Technology: Modeling, Experiments and Simulation*, Lecture Notes in Applied and Computational Mechanics, 77–99, Springer, 2018, ISBN 978-3-319-59547-4, doi: 10.1007/978-3-319-59548-1_6.

3 K. Takizawa, T.E. Tezduyar, H. Uchikawa, T. Terahara, **T. Sasaki**, K. Shiozaki, A. Yoshida, K. Komiya, and G. Inoue, "Aorta flow analysis and heart valve flow and structure analysis", in T.E. Tezduyar, editor, *Frontiers in Computational Fluid–Structure Interaction and Flow Simulation: Research from Lead Investigators under Forty – 2018*, Modeling and Simulation in Science, Engineering and Technology, 29–89, Springer, 2018, ISBN 978-3-319-96468-3, doi: 10.1007/978-3-319-96469-0_2.

Invited Conference Papers

1 **T. Sasaki**, K. Takizawa, T.E. Tezduyar, H. Takagi, K. Itatani, S. Miyazaki, and K. Miyaji, "Arterial dynamics computation with surface-extraction medical-image-based time-dependent anatomical models and element-based zero-stress estimates", in *Extended Abstracts of the 18th International Conference on Finite Elements in Flow Problems*, Taipei, Taiwan, (2015).

2 **T. Sasaki**, H. Uchikawa, K. Takizawa, T.E. Tezduyar, K. Itatani, S. Miyazaki, and K. Miyaji, "Arterial wall modeling with time-dependent medical images", in *Extended Abstracts of the 13th US National Congress on Computational Mechanics*, California, USA, (2015).

3 **T. Sasaki**, K. Takizawa, T.E. Tezduyar, H. Uchikawa, and K. Itatani, "Zero-stress state estimation in structural mechanics modeling of a human aorta with NURBS representation", in *Extended Abstracts of JST CREST–PRESTO Symposium 2015 — Mathematics for the 22nd Century*, Tokyo, Japan, (2015).

4 **T. Sasaki**, K. Takizawa, T.E. Tezduyar, H. Uchikawa, and K. Itatani, "Zero-stress state estimation in structural mechanics modeling of a human aorta with NURBS representation", in *Proceedings of KSME–JSME Joint Symposium on Computational Mechanics & CAE 2015*, Tokyo, Japan, (2015).

5 **T. Sasaki**, K. Takizawa, T.E. Tezduyar, H. Takagi, K. Itatani, S. Miyazaki, and K. Miyaji, "Arterial wall modeling with time-dependent surface extraction from medical images", in *Extended Abstracts of International Conference on Biomedical Technology 2015*, Hannover, Germany, (2015).

6 **T. Sasaki**, K. Takizawa, H. Uchikawa, H. Takagi, T.E. Tezduyar, and K. Itatani, "Aorta FSI analysis with the element-based zero-stress state estimation and isogeometric discretization", in *Extended Abstracts of the 12th World Congress on Computational Mechanics (WCCM XII) and the 6th Asia–Pacific Congress on Computational Mechanics (APCOM VI)*, Seoul, Korea, (2016).

7   **T. Sasaki**, K. Takizawa, and T.E. Tezduyar, "Estimation of arterial element-based zero-stress state with T-splines wall discretization", in *Extended Abstracts of USACM Conference on Isogeometric Analysis and Mesh-free Methods*, California, USA, (2016).

8   T. Terahara, K. Takizawa, T.E. Tezduyar, and **T. Sasaki**, "Heart valve flow analysis with the integrated space–time VMS, slip interface, and topology change methods and isogeometric discretization", in *Extended Abstracts of the 2017 Engineering Mechanics Institute Conference*, California, USA, (2017).

9   **T. Sasaki**, K. Takizawa, and T.E. Tezduyar, "Arterial element-based zero-stress state estimation with T-spline representation", in *Extended Abstracts of USACM Conference on Isogeometric Analysis and Meshfree Methods*, Pavia, Italy, (2017).

Contributed Conference Papers

1   T. Sasaki, K. Takizawa, K. Itatani, H. Takagi, T.E. Tezduyar, S. Miyazaki, and K. Miyaji, "An aorta dynamics computation with the element-based zero-stress state estimation method", in *Proceedings of JSME 25th Conference on Frontiers in Bioengineering*, Tottori, Japan, (2014).

2   T. Sasaki, K. Takizawa, K. Itatani, H. Takagi, T.E. Tezduyar, S. Miyazaki, and K. Miyaji, "Arterial wall modeling and medical image mapping based on element-based zero-stress state estimation method", in *Proceedings of JSME 27th Bioengineering Conference*, Niigata, Japan, (2015).

3   M. Adachi, G.A. Domingues, T. Sasaki, R. Tsumura, T. Koshi, and K. Mori, "Novel social innovation concept based on the viewpoint of the infrastructure user", in *Proceedings of 2015 IEEE 12th International Symposium on Autonomous Decentralized Systems*, Taichung, Taiwan, (2015).

4   T. Sasaki, H. Uchikawa, K. Takizawa, T.E. Tezduyar, K. Itatani, S. Miyazaki, and K. Miyaji, "Physically based mapping and arterial wall modeling", in *Proceedings of the 20th Japan Society for Computational Engineering and Science Conference*, Ibaraki, Japan, (2015).

5   T. Sasaki, H. Uchikawa, K. Takizawa, T.E. Tezduyar, K. Itatani, S. Miyazaki, and K. Miyaji, "Arterial wall modeling with time-dependent medical images", in *Extended Abstracts of Mechanical Engineering Congress 2015*, Hokkaido, Japan, (2015).

6   Y. Otoguro, T. Kuraishi, Y. Tsutsui, T. Kanai, H. Hattori, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Space–time finite element analysis using NURBS basis functions", in *Proceedings of the Union Conference on Japan Society for Industrian and Applied Mathematics 2015*, Tokyo, Japan, (2015).

7   H. Uchikawa, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Modeling of the outlet BC in aorta fluid mechanics computation with the space–time isogeometric analysis", in *Proceedings of the 29th Symposium on Computational Fluid Dynamics*, Fukuoka, Japan, (2015).

8   T. Sasaki, K. Takizawa, H. Uchikawa, T.E. Tezduyar, and K. Itatani, "Zero-stress state estimation of aortic wall with NURBS representation", in *Proceedings of JSME 28th Bioengineering Conference*, Tokyo, Japan, (2016).

9   A. Takahashi, K. Suto, Y. Tobe, Y. Matsuhashi, S. Suzuki, T. Yagi, T. Sasaki, and K. Takizawa, "Development of visualization method for flow field around aortic valve model with stereo PIV", in *Proceedings of JSME 28th Bioengineering Conference*, Tokyo, Japan, (2016).

10   T. Sasaki, K. Takizawa, T.E. Tezduyar, and K. Itatani, "Aorta modeling with zero-stress estimation, material-point tracking, and isogeometric discretization", in *Proceedings of the 21st Japan Society for Computational Engineering and Science Conference*, Niigata, Japan, (2016).

11   T. Terahara, K. Takizawa, T.E. Tezduyar, and T. Sasaki, "Heart-valve fluid mechanics computation with asymmetric valve motion", in *Proceedings of the 21st Japan Society for Computational Engineering and Science Conference*, Niigata, Japan, (2016).

12   H. Uchikawa, T. Sasaki, T. Terahara, K. Takizawa, and T.E. Tezduyar, "Periodicity studies in pulsating-arterial-flow computational analysis with smooth geometries and high-fidelity boundary-layer representation", in *Proceedings of the 21st Japan Society for Computational Engineering and Science Conference*, Niigata, Japan, (2016).

13 T. Sasaki, K. Takizawa, T.E. Tezduyar, and K. Itatani, "Aortic zero-stress state estimation with isogeometric discretization", in *Proceedings of JSME 29th Computational Mechanics Division Conference*, Aichi, Japan, (2016).

14 H. Uchikawa, T. Terahara, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "A space–time refinement study of the aorta fluid mechanics computations", in *Proceedings of JSME 29th Computational Mechanics Division Conference*, Aichi, Japan, (2016).

15 H. Uchikawa, T. Terahara, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Vortex structure and periodicity studies on aorta and aortic valve flow analysis", in *Proceedings of JSME 94th Fluids Engineering Conference*, Yamaguchi, Japan, (2016).

16 K. Shiozaki, T. Terahara, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Computational analysis of aortic-valve fluid mechanics and experimental validation", in *Proceedings of the 30th Symposium on Computational Fluid Dynamics*, Tokyo, Japan, (2016).

17 K. Shiozaki, T. Terahara, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Computational analysis and experimental validation of aortic valve fluid mechanics with experiment-based anatomical models", in *Proceedings of JSME 29th Bioengineering Conference*, Aichi, Japan, (2017).

18 A. Yoshida, T. Sasaki, T. Terahara, K. Takizawa, and T.E. Tezduyar, "Estimation of zero-stress state in patient-specific aorta models with branches", in *Proceedings of JSME 29th Bioengineering Conference*, Aichi, Japan, (2017).

19 H. Uchikawa, T. Terahara, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Fluid and structure analysis of the human aorta — fluid mechanics analysis with space-time isogeometric discretization —", in *Proceedings of the 22nd Japan Society for Computational Engineering and Science Conference*, Saitama, Japan, (2017).

20 K. Shiozaki, T. Terahara, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Space–time isogeometric analysis of aortic-valve fluid mechanics and flow validation near the leaflet surfaces", in *Proceedings of the 22nd Japan Society for Computational Engineering and Science Conference*, Saitama, Japan, (2017).

21 A. Yoshida, T. Sasaki, T. Terahara, K. Takizawa, and T.E. Tezduyar, "Estimation of zero-stress state in patient-specific aorta models with branches", in *Proceedings of the 22nd Japan Society for Computational Engineering and Science Conference*, Saitama, Japan, (2017).

22 T. Terahara, K. Shiozaki, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Heart valve flow analysis with isogeometric discretization and resolved jet flow near leaflet surfaces", in *Extended Abstracts of Mechanical Engineering Congress 2017*, Saitama, Japan, (2017).

23 H. Uchikawa, T. Terahara, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Patient-specific aorta flow analysis with the space–time VMS method and isogeometric discretization", in *Extended Abstracts of Mechanical Engineering Congress 2017*, Saitama, Japan, (2017).

24 T. Sasaki, K. Takizawa, A. Yoshida, and T.E. Tezduyar, "Arterial zero-stress estimation –basic study–", in *Proceedings of JSME 30th Computational Mechanics Division Conference*, Osaka, Japan, (2017).

25 A. Yoshida, K. Takizawa, T. Sasaki, and T.E. Tezduyar, "Arterial zero-stress estimation –extension to complex geometry–", in *Proceedings of JSME 30th Computational Mechanics Division Conference*, Osaka, Japan, (2017).

26 K. Shiozaki, T. Terahara, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Aortic valve and ST blood flow analysis", in *Proceedings of JSME 30th Computational Mechanics Division Conference*, Osaka, Japan, (2017).

27 T. Terahara, T. Sasaki, K. Shiozaki, K. Takizawa, and T.E. Tezduyar, "Aortic valve analysis based on high-fidelity computational fluid dynamics", in *Proceedings of JSME 28th Conference on Frontiers in Bioengineering*, Tokushima, Japan, (2017).

28 T. Terahara, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Heart valve computational flow analysis with resolved jet flow near leaflet surface", in *Extended Abstracts of Research Committee on Blood Flow and Cardiovascular System*, Tokyo, Japan, (2017).

29 K. Shiozaki, T. Terahara, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Effect of aortic valve shape on flow", in *Proceedings of JSME 28th Conference on Frontiers in Bioengineering*, Tokushima, Japan, (2017).

30 T. Sasaki, H. Uchikawa, K. Komiya, K. Takizawa, and T.E. Tezduyar, "Effect for blood flow with arterial elasticity and arterial structure computation", in *Extended Abstracts of Research Committee on Blood Flow and Cardiovascular System*, Chiba, Japan, (2018).

31 G. Inoue, T. Sasaki, A. Yoshida, K. Takizawa, and T.E. Tezduyar, "Arterial isogeometric shell analysis with the lumen geometry extracted from medical images", in *Extended Abstracts of Mechanical Engineering Congress 2017*, Osaka, Japan, (2018).

32 G. Inoue, T. Sasaki, A. Yoshida, K. Takizawa, and T.E. Tezduyar, "Hyperelastic models for arterial mechanics with isogeometric discretization", in *Proceedings of JSME 29th Conference on Frontiers in Bioengineering*, Chiba, Japan, (2018).

33 R. Kobayashi, T. Terahara, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "A patient specific aortic valve analysis with resolved flow near the leaflet surfaces", in *Extended Abstracts of Mechanical Engineering Congress 2017*, Osaka, Japan, (2018).

34 A. Yoshida, T. Sasaki, K. Takizawa, and T.E. Tezduyar, "Aorta surface re-parametrization based on principal curvatures", in *Proceedings of JSME 31th Computational Mechanics Division Conference*, Tokushima, Japan, (2018).

Invited Presentations

Japanese

1 Forum: Concept-Oriented Research and Technology Development, Waseda University, Tokyo, August 2014.

2 The 1st Joint Symposium between Leading Graduate Program in Science and Engineering & Graduate Program for Embodiment Informatics, Waseda University, Tokyo, March 2016.

March 26, 2019