

CURRICULUM VITAE

PERSONAL INFORMATION:

Name: Satoshi Watanabe

Nationality: Japan

Birth date: July 6, 1971

PRESENT APPOINTMENT:

Professor in Department of Mechanical Engineering

Faculty of Engineering, Kyushu University

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CAREER HISTORY:

Professor, Faculty of Engineering, Kyushu University, 2012-present

Associate Professor, Faculty of Engineering, Kyushu University, 2000-2012

Lecturer, Faculty of Engineering, Kyushu University, 1998-2000

Visiting Researcher, Japan Aerospace Exploration Agency (JAXA), 2005-2012

Visiting Researcher, California Institute of Technology, 2000-2001

JSPS (Japan Society of the Promotion of Science) Research Fellow, Osaka University, 1997-1998

ACADEMIC/PROFESSIONAL QUALIFICATIONS:

Ph.D, Osaka University, Japan, 1997

Master of Engineering, Osaka University, Japan, 1995

AWARDS:

Best Paper Award of Turbomachinery Society of Japan, 2014, 2015 and 2020

Frontier Research Award, Fluids Engineering Division, Japan Society of Mechanical Engineers, 2013

Best Paper Award of Turbomachinery Society of Japan, 2013

Best Paper Award of Japan Society of Mechanical Engineers, 2001

CURRENT RESEARCH INTERESTS

Research and development of turbopumps

- Development of high-performance contra-rotating axial flow pump
- Understanding of flow mechanism for fluid forces in multi-stage pump

Cavitation and two phase flow instabilities in turbopumps

- Understanding and suppression of cavitation instabilities in pump inducer
- Pressure pulsations of centrifugal pump due to air entrainments
- Cavitation in automotive torque converter

Basic and thorough understandings of cavitating flow

- Detailed analysis of cavitating hydrofoil toward its precise prediction
- Modeling and understanding of thermodynamic effect of cavitation
- Modeling and understanding of gas diffusion in cavitation

Effective utilization of natural flow stream as a renewable energy source

- Development of Darrieus-type hydroturbine for natural flow streams

JOURNAL PUBLICATIONS (More than 100 papers including Japanese ones) :

1. T. Morii, Y. Tanaka, **S. Watanabe**, S. Ohashi and Y. Matsunaga, 2019, Suction Performance and Cavitation Instabilities of Turbopumps with Three Different Inducer Design, *Int. J. of Fluid Machinery and Systems*, Vol. 12, No. 2, pp. 128-135.
2. K. Tsutsumi, **S. Watanabe**, S. Tsuda and T. Yamaguchi, 2017, Cavitation Simulation of Automotive Torque Converter Using a Homogeneous Cavitation Model, *European Journal of Mechanics - B/Fluid*, Vol. 61, No. 2, pp.263-270.
3. W. Tsuru, T. Konishi, **S. Watanabe**, S. Tsuda, 2017, Observation of Inception of Sheet Cavitation from Free Nuclei, *J. of Thermal Science*, Vol. 26, No. 3, pp. 223-228.
4. L. L. Cao, **S. Watanabe**, H. Honda, H. Yoshimura and A. Furukawa, 2014, Experimental Investigation of Blade-To-Blade Pressure Distribution in Contra-Rotating Axial Flow Pump, *Int. J. of Fluid Machinery and Systems*, Vol.7, No.4, pp.130-141.
5. **S. Watanabe**, N. Inoue, K. Ishizaka, A. Furukawa and J.-H. Kim, 2010, Internal Flow of a Two-Bladed Helical Inducer at an Extremely Low Flow Rate, *Int. J. Fluid Machinery and Systems*, Vol.3, No.2, pp.129-136.
6. **S. Watanabe**, A. Furukawa and Y. Yoshida, 2008, Theoretical Analysis of Thermodynamic Effect of Cavitation in Cryogenic Inducer Using Singularity Method, *Int. J. Rotating Machinery* Vol. 2008, Article ID 125678.
7. **S. Watanabe**, T. Hidaka, H. Horiguchi, A. Furukawa, Y. Tsujimoto, 2007, Analysis of Thermodynamic Effects on Cavitation Instabilities, *ASME J. Fluids Engineering*, Vol.129, pp.1123-1130.
8. **S. Watanabe** and C. E. Brennen, 2003, Dynamics of Cavitating Propeller in a Water Tunnel, *ASME J. Fluids Engineering*, Vol. 125, No. 2, pp.283-292.
9. **S. Watanabe**, Y. Tsujimoto and A. Furukawa, 2001, Theoretical Analysis of Transitional and Partial Cavity Instabilities, *ASME J. Fluids Engineering*, Vol.123, No.3, pp.692-697.
10. **S. Watanabe**, K. Sato, Y. Tsujimoto and K. Kamijo, 1999, Analysis of Rotating Cavitation in a Finite Pitch Cascade Using a Closed Cavity Model and a Singularity Method, *ASME, J. Fluids Engineering*, Vol. 121, No. 4, pp.834-840.

PRESENTATIONS AT INTERNATIONAL CONFERENCES (Totally more than 140)

1. Y. Katayama, Y. Hosoi, Y. Fukuda, **S. Watanabe**, S. Tsuda, Y. Mori and K. Ito, 2019, Experimental Investigation on Cavitation Performance of Torque Converter Using Transparent Model, *ASME-JSME-KSME 2019 Joint Fluids Eng. Conf. (AJK2019)*.
2. **S. Watanabe**, 2019, Unsteady Lift and Drag Forces During Cavitation Instabilities of Hydrofoil, *The 3rd Int. Symp.of Cavitation and Multiphase Flow (ISCM2019)*, **invited**.
3. Y. Ehara, S. Kitamura, W. Tsuru, **S. Watanabe** and S. Tsuda, 2018, Unsteady Forces and Moments Acting on a Cantilevered Rectangular Hydrofoil with Tip Clearance in Cavitating conditions, *29th IAHR and Machinery and Hydraulic Systems (IAHR2018)*.
4. S. Tsuda and **S. Watanabe**, 2018, CFD Simulation of Thermodynamic Effect Using a Homogeneous Cavitation Model Based on Method of Moments, *10th International Symposium on Cavitation (CAV2018)*.
5. W. Tsuru, **S. Watanabe** and S. Tsuda, 2018, Behaviors of Free Bubble Nuclei in Inception of Sheet Cavitation, *10th International Symposium on Cavitation (CAV2018)*.
6. **S. Watanabe**, 2017, Revisiting/Retrying Cavitating Hydrofoil Experiment/Analysis, *1st Asian Working Group-IAHR's Symp. on Hydraulic Machinery and Systems*, **invited**.
7. **S. Watanabe**, H. Watanabe and K. Miyagawa, 2016, Unsteady Flow Phenomena and Fluid Forces in a Three-Stage Centrifugal Pump, *The 7th International Symposium on Fluid Machinery and Fluids Engineering (ISFMFE 2016)*, **keynote lecture**.
8. **S. Watanabe**, 2016, Modeling and Experimental Issues on Thermal Effect of Cavitation, *6th Asian Joint Workshop on Thermophysics and Fluid Science 2016 (6th AJWTF)*, **invited**.
9. **S. Watanabe**, W. Tsuru, Y. Yamamoto and S. Tsuda, 2016, Cavitation Simulation Using a New

- Simple Homogeneous Cavitation Model, 16th International Symposium on Rotating Machinery and Transport Phenomenon (ISROMAC2016), 302.
10. S. Tsuda, H. Hyodo and **S. Watanabe**, 2015, Validation of Bubble Dynamics Equation for a Nano-scale Bubble via Molecular Dynamics Simulation, the 9th International Symposium on Cavitation (CAV2015).
 11. **S. Watanabe**, L.-L. Cao, T. Tsuneda and A. Furukawa, 2015, Toward High Performance Design of Contra-Rotating Axial Flow Pump, 7th International Conference on Pumps and Fans (ICPF2015), **Invited**.
 12. H. Daido, **S. Watanabe** and S. Tsuda, 2015, Effects of Dissolved Gas on Unsteady Cavitating Flow around a Clark y-11.7% Hydrofoil, ASME-JSME-KSME Joint Fluids Engineering Conference 2015 (AJK2015Fluids-05488).
 13. H. Matsunari, **S. Watanabe**, Y. Konishi, N. Suefuji and A. Furukawa, 2012, Experimental/Numerical Study on Cavitating Flow around Clark Y 11.7% Hydrofoil, the Eighth International Symposium on Cavitation (CAV2012) , No.224.
 14. **S. Watanabe**, R. Otani, S. Kunimoto, Y. Hara, A. Furukawa and S. Watanabe, 2012, Vibration Characteristics Due to Cavitation in Stator Element of Automotive Torque Converter at Stall Condition, ASME FEDSM2012, FEDSM2012-72418.
 15. T. Igoshi, Y. Uchinono, E. Koroitamana, K. Ishizaka, **S. Watanabe** and A. Furukawa, 2011, Effect of Leading Edge Sweep on Cavitation Performance of Two-Bladed Flat Plate Inducer, ASME-JSME-KSME Joint Fluids Engineering Conference 2011, AJK2011-06055.
 16. **S. Watanabe**, Y. Konishi, I. Nakamura and A. Furukawa, 2011, Experimental Analysis of Cavitating Behavior around a Clark Y Hydrofoil, WIMRC Third Int. Cavitation Forum 2011, No.1-6.
 17. **S. Watanabe**, A. Ikeda, I. Nakamura and A. Furukawa, 2010, Observation of Unsteady Cavitating Flow in Flat Plate Cascades, the 25th IAHR Symp. on Hydraulic Machinery and Systems, Vol.1, pp.363-370.
 18. **S. Watanabe**, T. Suefuji, A. Ikeda and A. Furukawa, 2010, Experimental Study of Cavitating Flow in Flat Plate Cascades with/without Tip Clearance, 13th Int. Symp. on Transport Phenomena and Dynamics of Rotating Machinery, CAV_F50.
 19. **S. Watanabe**, A. Furukawa, Y. Yoshida and Y. Tsujimoto, 2009, Analytical Investigations of Thermodynamic Effect on Cavitation Characteristics of Sheet and Tip Leakage Vortex Cavitation, the Sixth International Symposium on Cavitation (CAV2009) , No.40.
 20. **S. Watanabe**, A. Ikeda, A. Furukawa and K. Nishii, 2008, An Analysis of Thermodynamic Effect of Tip Leakage Vortex Cavitation, WIMRC 2nd Int. Cavitation Forum 2008, pp.226-231.

PROFESSIONAL ACTIVITIES:

Society members:

- American Society of Mechanical Engineers
- Japan Society of Mechanical Engineer
- Turbomachinery Society of Japan
- Japanese Society of Multiphase Flow

Journal editors and reviewers:

- Associate Editor, JSME Journal of Fluid Science and Technology, 2012-present
- Associate Editor, JSME Mechanical Engineering Journal, 2020-present
- Associate Editor, ASME Journal of Fluids Engineering, 2013-2019
- Review Experiences (International):
ASME J. Fluid Engineering, AIAA J. Propulsion and Power, J. Fluid Mechanics, Int. J. Rotating Machinery, International Journal of Fluid Machinery and etc.

Conferences:

- ASME-JSME-KSME Joint Fluids Engineering Conference 2019 (San Francisco, July 2019),

Co-Chair from JSME.

- ASME-JSME-KSME Joint Fluids Engineering Conference 2019 (San Francisco, July 2019), Tenth International Symposium on Pumping Machinery, Lead Organizer from JSME.
- 17th International Symposium on Rotating Machinery and Transport Phenomenon (Maui, December 2017), Forum Organizer
- ASME 2017 Fluids Engineering Summer Meeting (FEDSM2017, Waikoloa, Hawaii, July 2017), Ninth International Symposium on Pumping Machinery, Lead Organizer from JSME.
- Twenty-Eight IAHR Symposium on Hydraulic Machinery and Systems (Grenoble, France, July 2016), Scientific Committee Member.
- 16th International Symposium on Rotating Machinery and Transport Phenomenon (Honolulu, April 2016), Forum Organizer
- The 13th Asian International Conference of Fluid Machinery (Tokyo, September 2015), Local Organizing Committee Member and Editor of Proceedings
- ASME-JSME-KSME Joint Fluids Engineering Conference 2015 (Seoul, Korea, July 2015), Eighth International Symposium on Pumping Machinery, Lead Organizer from JSME.
- International Symposium on Cavitation and Multiphase Flow 2014 (Beijing, China, October 2014), International Advisory Committee Member.
- The Sixth International Conference on Pumps and Fans with Compressors and Wind Turbines (Beijing, China, September 2013), International Advisory Committee Member.
- Twenty-Sixth IAHR Symposium on Hydraulic Machinery and Systems (Beijing, China, August 2012), Scientific Committee Member.
- The 8th KSME-JSME Thermal and Fluids Engineering Conference (Incheon, Korea, March 2012), Secretary General.
- ASME-JSME-KSME Joint Fluids Engineering Conference 2011 (Hamamatsu, Japan, July 2011), Seventh International Symposium on Pumping Machinery, Co-Organizer.
- Twenty-Fifth IAHR Symposium on Hydraulic Machinery and Systems (Timisoara, Romania, September 2010), Scientific Committee Member.