

JORGE SOLIS-ALFARO, Ph.D.

Associate Professor

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Adjunct Researcher

Waseda University, Research Institute of Science and Engineering
3-4-1 Ookubo, Shinjuku-ku, 169-8555 Tokyo, JAPAN

E-mail: solis@ieee.org

Visiting Scholar

Tokyo Institute of Technology, Department of Mechanical Design and Engineering
2-12-1, Ookayama, Meguro-ku, Tokyo 152-8552, JAPAN

Visiting Researcher

Waseda University, Humanoid Research Institute
3-4-1 Ookubo, Shinjuku-ku, 169-8555 Tokyo, JAPAN

PROFESSIONAL SUMMARY

Jorge has over twenty-five years of experience in both scientific and industrial oriented research projects in the EU as well as Japan. Fifteen years of experience as a Project/Scientific Leader in collaboration with different universities, and design engineers from highly regarded Japanese companies in the medical field such as Kyotokagaku Co. Ltd., Hitachi Aloka Medical Ltd., etc. Jorge's excellence has been also recognized in 2024 by the Royal Swedish Academy of Engineering Sciences (IVA). An extensive list of publication list with peer reviewed papers (22 international journals and 152 international conferences) and monograph books (3 edited volumes and 17 book chapters) with a total number of citations of 1944 (since 2020: 441), h-index: 25 (since 2020: 10) and i10-index: 68 (since 2020: 13) [source Google Scholar]. Jorge has obtained 3 finalist awards at International Conference on Robots and Intelligent Systems (2007 and 2009) and International Conference on Advanced Intelligent Mechatronics (2009), a best paper conference award at the 12th International Conference on Complex Medical Engineering and excellent paper award at icSmartGrid 2019. He has been the general co-chair of the 14th Mechatronics Forum International Conference and program co-chair for the 2026 IEEE/SICE International Symposium on System Integration. He is a senior member of the IEEE, member of the Robotics Commission for the IFToMM, the International Federation for the Promotion of Machine and Mechanism Science.

QUALIFICATIONS

- | | |
|--------------------|--|
| 2001 – 2004 | Ph.D. in Robotics (graduated with honors)
Scuola Superiore Sant'Anna, Pisa, Italy |
| 1994 – 1998 | BS in Electronic Systems (EE) (graduated with honors)
ITESM, Toluca, Mexico |
| 1998 – 2000 | Professional Development Program (program for high-level potential industry leaders in Mexico)
IBM of Mexico |

CURRENT RESEARCH FOCUS

Human-/environment-robot interaction, intelligent machines and automation systems, embedded and intelligent control, haptic rendering and multimodal feedback as well as biologically-inspired architecture design.

RESEARCH VISION

My research at the physically and cognitive embodied robotics and intelligent machines laboratory specializes in physically and cognitive embodied human-friendly robot systems with enhanced capabilities to interact with humans and/or the environment. This is an inter-disciplinary research field, which includes both basic and applied research on identifying novel applications of cutting-edge material science, sensor technology, advanced signal processing and advanced control. Exploring and proposing novel techniques for modelling and embedded advanced control in order to address the industrial needs is a central aspect of this research.

WORK EXPERIENCE

- 04/2012 - Current** Associate Professor, Faculty of Technology and Science, Karlstad University, Karlstad, Sweden
2018-2023 Adjunct Associate Professor, Faculty of Engineering, University of Southern Denmark, Odense, Denmark

- 10/2017 - Current** Visiting Scholar, Department for Mechanical Sciences and Engineering, Tokyo Institute of Technology, Tokyo, Japan
- 06/2011 - Current** Adjunct Researcher, Research Institute for Sci. and Eng., Waseda University, Tokyo, Japan
- 06/2011 –03/2011** Senior Lecturer, Faculty of Technology and Science, Karlstad University, Karlstad, Sweden
- 04/2009 –05/2011** Assistant Professor, Research Institute for Science and Engineering, Waseda University, Tokyo, Japan
- 10/2009–11/2009** Visiting Professor, Warsaw University of Technology, Warsaw, Poland
- 04/2006 –03/2008** Research Associate, Department of Modern Mechanical Eng., Waseda University, Tokyo, Japan
- 07/2004 –03/2006** Post-Doctoral Researcher at Humanoid Robotics Institute, Waseda University, Tokyo, Japan
- 01/2001 –04/2004** Research Assistant, Perceptual Robotics Laboratory, Scuola Superiore Sant’Anna, Pisa, Italy
- 03/2000 –11/2000** Visiting Researcher at Cybernetics Division, Mechanical Engineering Laboratory, Tsukuba, Japan
- 12/1998 – 02/2000** RS/6000 Hardware Support Engineer, RS/6000 Support Division, IBM of Mexico, Mexico City, Mexico
- 06/1998 –07/1998** Visiting Researcher, Laboratoire d’Analyse et Architecture de systèmes (LAAS/CNRS), Toulouse, France

SELECTED ACADEMIC ACHIEVEMENTS

- **3 edited volumes, 17 book chapters, 21 International Journals and 142 International Conferences** have been published as author and/or co-author.
- Invited to present over 30 lectures in well recognized universities in America (CMU, Georgia Tech, McGill Univ., and similar institutions), Europe (Leeds University, Karlsruhe University, Royal Institute of Technology), Asia (Waseda University, Tokyo Institute of Technology, etc.), and Oceania (University of Technology in Sydney, etc.)
- **1 best paper conference award at CME2012, 1 excellent paper award at icSmartGrid 2019, 3 finalist awards at IROS 2007, AIM 2009, IROS 2009 and a silver student paper award at ISRM 2024**
- Co-supervision of research of 2 Ph.D. Students, 29 Master Students, and 24 Undergraduate Students.
- Implementation of a new curriculum and textbook for the Mechatronics Laboratory 1 and 2 at the undergraduate level at the Department of Modern Mechanical Engineering of Waseda University; responsible for this class for four years, during which time my students gave me highly favourable evaluations for the content and presentation of lectures and experiments.

SCIENTIFIC RESEARCH FUNDS (Principal Investigator/Co-principal investigator)

- (Co-PI) Use of AI for development and condition monitoring of energy storage devices, Swedish Energy Agency, 2024-2026, Total Fund: 180 000 SEK
- (PI) [Collaborative robots using mixed reality \(MR\) and artificial intelligence \(AI\)](#), VINNOVA, 2021-2022, 148 285 SEK
- (PI) [Development of intelligent control systems for greenhouse lighting system with a high proportion of local renewable energy](#), Swedish Energy Agency, 2020~2025, Total Fund: 3 515 486 SEK
- (PI) [Assistive robot with a multi-gripper tool and vision system for frail elderlies independent lives](#), JST-VINNOVA Sweden Academia-Industry International Collaboration Program on Innovative Solutions, Community Design and Services for Elderly People, 2017~2019, Total Fund: 1 800 000 SEK
- (PI) [Development of a human-friendly assistive robot vehicle for supporting physically elderly and assisting care givers for the ambient assisted living](#), Grant-in-aid for Associate Professor and Professor Research Support (LOPS14) from Karlstad University (Dnr C2014/633), 2015~2017, Total Fund: 800,000 SEK
- (PI) [Human-Friendly Robotics](#), Japanese Ministry of Education, Culture, Sport, Science and Technology, 2011~2013, Total Fund: 3.3 million JPY
- (PI) [Toward Enabling the Musical Interaction among Wind Playing-Instrument Anthropomorphic Robots](#), Research Institute for Science and Engineering (Waseda University), 2010, Total Fund: 1.0 million JPY
- (Co-PI) [Development of an Inverted Pendulum Type Robotic Education Kit](#), Robotics Industry Development Council (Waseda University), 2008-2010, Total Fund: 10 million JPY
- (PI) [Development of Hardware Components to Enhance the Expressiveness of Musical Performance Robots while Interacting in Musical Terms](#), Research Institute for Science and Engineering (Waseda University), 2009, Total Fund: 1.0 million JPY
- (PI) [Study of Human Motor Control and Learning by Using Humanoid Robots as Transfer Skill Systems to Improve Learner’s Performances and Understand the Parameters that May Lead or Break Down the Learning Process](#), Japanese Society for the Promotion of Science, 2004–2006, Total Fund: 2.4 million JPY

AWARDS AND RECOGNITIONS

- 2024 Silver student paper award – International Symposium on Robotics and Mechatronics, Djerba, April 17-19**
Paper title: From Gestures to Behaviors: An empirical study on behavior-driven development scenarios to support end-users programming of collaborative robots
 Authors: De la Rosa, J., Solis, J., Nakamori, K., Garcia, G., Silva, T., Stengaard, A., Håkansson, J.
- 2021 Best paper finalist award – International Conference on Smart Grid, Setubal, June 29 – July 1**
Paper Title: Analyzing the effect of snow in PV regulator response in a PV solar park
 Authors: Solis, J., Råberg, A., André, J., Nilsson, M.
- 2019 Excellent paper award – International Conference on Smart Grid, Newcastle, December 9– 11**
Paper Title: Forecasting of Electric Energy Consumption for Housing Cooperative with a Grid Connected PV System
 Authors: Solis, J., Tomohiro, O., Ericson, J., Nilsson, M.
- 2017 IEEE Senior Member**
- 2012 Best conference paper award – International Conference on Complex Medical Engineering, Kobe, July 1– 4**
Paper Title: Development of Airway Management Training System WKA-4: Provide Useful Feedback of Trainee Performance to Trainee during Airway Management
 Authors: Yohan, N., Wang, C., Tokumoto, M., Solis, J., Ishii, H., Takanishi, A..
- 2009 Finalist for the Award on Entertainment Robots and Systems – IROS 2009 / New Technology Foundation, St. Louis, October 11– 15**
Paper Title: Development of Anthropomorphic Musical Performance Robots: From Understanding the Nature of Music Performance to Its Application to Entertainment Robotics
 Authors: Solis, J., Petersen, K., Ninomiya, T., Takeuchi, M., Takanishi, A.
Best Student Paper Award – AIM2009, Singapore, July 14–17
Paper Title: Development of a Robotic Carotid Blood Measurement WTA-IRII: Mechanical Improvement of the Gravity Compensation Mechanism and Optimal Link Position of the Parallel Manipulator Based on GA.
 Authors: Nakadate, R., Uda, H., Hirano, H., Solis, J., Takanishi, A., et al.
- 2007 Finalist for the Award on Entertainment Robots and Systems – IROS 2007 / New Technology Foundation, San Diego, October 29–November 2**
Paper Title: The Waseda Flutist Robot No. 4 Refined IV: Enhancing the sound clarity and the articulation between notes by improving the lips and tonguing mechanisms
 Authors: Solis, J., Taniguchi, K., Ninomiya, T., Yamamoto, T., Takanishi, A.
- 2004 – 2006 Postdoctoral Fellowship**
 Japan Society for Promotion of Science (JSPS)
 Tokyo, Japan
- 2001 – 2004 Scholarship for Ph.D. Research**
 Scuola Superiore Sant’Anna / Perceptual Robotics Laboratory
 Pisa, Italy
- 2000 Scholarship for postgraduate studies**
 Embassy of Japan in Mexico / JICA
 Mexico City, Mexico
- 1994 – 1998 Scholarship for Academic Excellence and Achievement**
 Monterrey Institute of Technology, Toluca Campus
 Toluca, Mexico

RESEARCH PROJECTS (Principal Investigator/Co-principal investigator)

- (Co-PI) Anthropomorphic Flutist Robot, Project Leader, 2004–2010
 - Research supported (in part) through a grant in aid from Gifu Prefecture for the WABOT-HOUSE Project
 - (<http://www.wabot-house.waseda.ac.jp/html/e-house.htm>)
 - Total Funding (2004–2010): 10 million JPY
 - Humanoid Robot consisting of 41 DOFs that mechanically emulate the physiology and anatomy of the organs of the body involved in playing the flute .
- (Co-PI) Anthropomorphic Saxophonist Robot, Project Leader, 2007–2010
 - Project supported (in part) by HRI (<http://www.humanoid.waseda.ac.jp/>)
 - Total Funding (2007–2010): 7 million JPY

- Humanoid Robot consisting of 15 DOFs that mechanically emulate the physiology and anatomy of the organs involved in playing the saxophone.
- (Co-PI) Two-Wheeled Type Inverted Pendulum Mobile Robot, Project Leader, 2008–2010
 - Project supported by a grant in Aid from the Robotics Industry Development Council (<http://www.joho-fukuoka.or.jp/robot/english/>).
 - Total Funding (2008–2010): 10 million JPY
 - Mechatronic system designed as an educational tool to introduce undergraduate students the principles of robot technology (sensor, control, and actuator).
- (Co-PI) Airway Management and Suture/Ligature Training Systems, Scientific Leader, 2006–2008
 - Project supported by the Knowledge Cluster Initiative, a project of the Ministry of Education, Culture, Sports, Science, and Technology (<http://www.mext.go.jp/english/>) coordinated by Prof. Atsuo Takanishi.
 - Total Funding (2006–2008): 20 million JPY
 - Medical Training systems designed toward enhancing the understanding of the learning process while performing medical procedures by developing a Patient Robot (Active Training).
- (Co-PI) Musical-Based Interaction System (MbIS), Scientific Leader, 2008–2009
 - Project supported by Waseda University program on Global Center of Excellence (<http://www.rt-gcoe.waseda.ac.jp/>) coordinate by Prof. Atsuo Takanishi.
 - Total Funding: 1.3 million JPY
 - The MbIS is designed to enable musical robots to interact with musicians and aural processing is based on harmony/rhythm pattern tracking and visual processing is based on motion/particle tracking
- (Co-PI) Oral Rehabilitation Robot, Scientific Leader, 2006–2008
 - Project supported by the Knowledge Cluster Initiative, a project of the Ministry of Education, Culture, Sports, Science and Technology (<http://www.mext.go.jp/english/>) coordinated by Prof. Atsuo Takanishi.
 - Total Funding: 70 million JPY
 - Robot designed to provide massage of the maxillofacial region as a form of therapy for patients with temporomandibular joint disorders
- (PI) General Transfer Skill System (GTSS), Project Leader, 2004–2006
 - Project supported by the Japanese Society for the Promotion of Science (<http://www.jsps.go.jp/english>)
 - Total Funding (2004–2006): 2.4 million JPY
 - The GTSS is designed to enable MPRs to transfer skills to unskilled subjects and includes a melody recognition system (based on HMM), an evaluation module (based on harmonic analysis), and an interaction module to maintain eye contact with the robot's partner.
- (PI) Handwriting Transfer Skill System, Project Leader, 2001–2004
 - Project supported under a Ph.D. fellowship
 - Total Funding (2001–2004): 3,000 EUR
 - The proposed handwriting transfer skill system is based on a desktop haptic interface and the proposed system has been designed to provide multimodal feedback to unskilled users
- BODY EXTENDER, Research Collaborator, 2004
 - Project supported by the Italian Ministry of Defense coordinated by Prof. Massimo Bergamasco (http://www.percro.org/index.php?pageId=BodyExtender_0)
 - Total Funding (2003–2005): 3,000 EUR
 - Development of a teleoperation system composed by a manipulator controlled by a master interface
- ENACTIVE, Research Collaborator, 2004
 - Project supported by European Union under the IST 6th European Framework Program, (<http://www.percro.org/index.php?pageId=ENACTIVENetwork>) coordinated by Prof. Bergamasco
 - Total Funding (2004–2007): 5 million EUR
 - Development of teleoperation systems using a haptic interface and development of the control system for a 2-DOF novel haptic desktop oriented to automation of office procedures and education
- VIRTUAL, Research Collaborator, 2002
 - Project supported by European Commission “GROWTH” Program Research Project “Virtual” (<http://www.percro.org/index.php?pageId=VIRTUAL>) under contract 1999-RD. 11 030 coordinated by Prof. Massimo Bergamasco
 - Total Funding (2000–2002): 4 million EUR
 - The main goal of the “Virtual” project was to develop and test different kinds of virtual reality (VR)-driving simulators for the purpose of performing ergonomic evaluations and training of novice drivers based on haptic interface technology
- SINTESIS, Research Collaborator, 2002–2003
 - Project supported by Centre Recherche Fiat (<http://www.crf.it/en-us/pages/default.aspx>) coordinated by Prof. Massimo Bergamasco

- Total Funding (2002–2003): 5,000 EUR
 - Technical management of the motion capture subsystem and development of an acquisition system for a driving simulator for the FIAT Company.
- Tele-operation System, Research Assistant, 2000
 - Project supported by the Japan International Cooperation Agency (www.jica.go.jp/english/) coordinated by Prof. Kiyoshi Komoriya.
 - Total Funding (2000): 2.5 million JPY
 - Development of a teleoperation system for a nohologic mobile base based on a haptic interface

ACADEMIC APPOINTMENTS

- Programme coordinator for the Bachelor of Science in Electrical Engineering (2015-)
- International coordinator for the Department of Engineering and Physics (2013-)

TEACHING

- Embedded Control System (ELGB25), Bachelor in Electrical Engineering, Karlstad University (2016-)
- Project course in Electrical Engineering (ELGB24), Bachelor in Electrical Engineering, Karlstad University (2016-)
- Automatic Control Civ. (ELGB11), Master of Science in Engineering, Karlstad University (2012-)
- Digital Electronics (ELGA02), Master of Science in Engineering, Karlstad University (2015-2017)
- Wave Physics and Electric Circuits (FYGA17), Master of Science in Engineering, Karlstad University (2015-2017)
- Hydraulic and Pneumatic (MSGB24), Bachelor in Mechanical Engineering, Karlstad University (2015)
- Technology and Technology education (FYGT05), Teacher Education, Karlstad University (2015-2016)
- Teacher education in Technology for grades 7-9 (LLGB09), Special Teacher Education Programme, Karlstad University (2013-2015)
- Mechatronics E (ELGB06), Bachelor in Electrical Engineering, Karlstad University (2014-2015)
- Automatic Control (ELGB03), Bachelor in Mechatronics, Karlstad University (2012-2014)
- Robotics and Embedded Control (ELAD15), Master of Science in Engineering, Degree Programme in Electrical Engineering, Karlstad University (2011-2012)
- Advanced Robotics and Intelligent Control (ELAD16), Master of Science in Engineering, Degree Programme in Electrical Engineering (2011-2012)
- Robotics Course, European Master on Advanced Robotics, Warsaw University of Technology (2009, 15hrs)
- Responsible: Prof. Solis
- Mechatronics Laboratory 1, School of Creative Science and Engineering, Waseda University (2006–2010)
- Responsibles: Prof. Sugano, Prof. Solis, Prof. Takanishi, Prof. Fujie
- Mechatronics Laboratory 2, School of Creative Science and Engineering, Waseda University (2006–2009)
- Responsibles: Prof. Iwata, Prof. Sugano, Prof. Solis, Prof. Takanishi, Prof. Fujie

CO-DIRECTION OF THESIS & EXAMINATION

Ph.D. Students

1. Name: Akihiro Funaki, Tokyo Institute of Technology (internship)
Title: Intelligent battery control for greenhouses with PV and battery energy storage
Year: 02/2024 – 04/2024
2. Name: Jose Pablo de la Rosa, University of Southern Denmark (internship)
Title: An empirical study on behaviour-driven development scenarios to support end-user programming of collaborative robots
Year: 01/2023 – 03/2023
3. Name: Dwinanri Egyna, Tokyo Institute of Technology (internship)
Title: AI-based Solar Power Production Forecasting
Year: 02/2022 – 03/2022
4. Name: Juan Manuel Jacinto Villegas, Scuola Superiore Sant'Anna – PERCRO (evaluation committee)
Title: Teleoperation, Teleoperation-Robotics and Industrial Context
Year: 03/2017
5. Name: Daniel R. Ramirez Rebollo, ITESM – Campus Cd. De Mexico (internship)
Title: System integration of a multipurpose human-friendly assistive robot vehicle
Year: 08/2016 – 01/2017
6. Name: Erfan Shojaei Barjuei, Università degli studi di Udine (internship)
Title: Control design of a human-friendly walking assist robot vehicle
Year: 08/2015 – 12/2016

7. Name: Marina Vela, Scuola Superiore Sant'Anna – PERCRO (evaluation committee)
Title: Localization and modeling of human motion for the mapping and control of autonomous, virtual and robotic agents
Year: 01/2012
8. Name: Yohan Noh, Waseda University (co-supervision)
Title: Study on the Development of an Airway Training Management System
Year: 03/2011
9. Name: Klaus Petersen, Waseda University (co-supervision)
Title: Study on Musical Performance Robots: Enhancing the Interaction with Human Players within the context of musical-band and Its Applications
Year: 03/2011

Master Students

1. Eden Martin (UC Louvain, Reader)
Title: Task planning system using foundation models in multimodal human-robot collaboration
Year: 2024
2. Brieuc Bastin (UC Louvain, Reader)
Title: GPTally: A safety-oriented system for human-robot collaboration based on foundation models
Year: 2024
3. Koyu Nakamori (Karlstad University, Internship)
Title: Gesture Recognition System for Collaborative Robots
Year: 10/2023– 12/2023
4. Haruki Kohata (Karlstad University, Internship)
Title: Cost benefit analysis and prediction of parameters for optimal battery use in energy storage system
Year: 06/2021– 09/2021
5. Sebastian Lind (Karlstad University; Supervisor)
Title: Ensemble approach to prediction of initial velocity centered around random forest regression and feed forward deep neural networks
Year: 2020
6. Chihiro Kato (Karlstad University; Supervisor)
Title: Cost benefit analysis for business model in Energy Storage System
Year: 2019
7. Tomohiro Oka (Karlstad University; Supervisor)
Title: LSTM Neural Network Model for Electricity Consumption Prediction
Year: 2019
8. Barkman, Richard Dan William (Karlstad University; Supervisor)
Title: Object Tracking Achieved by Implementing Predictive Methods with Static Object Detectors Trained on the Single Shot Detector Inception V2 Network
Year: 2019
9. Khajo, Gabriel (Karlstad University; Supervisor)
Title: Region Proposal Based Object Detectors Integrated With an Extended Kalman Filter for a Robust Detect-Tracking Algorithm
Year: 2019
10. Simon Johansson (Karlstad University; Supervisor)
Title: Control of a drone with weight load
Year: 04/2018 – 06/2018
11. Simon Johansson (internship)
Title: Control of a unmanned aerial vehicle
Year: 02/2018 – 03/2018
12. Baltej Singh (internship)
Title: Variable stiffness mechanism of a human-friendly walking assist robot vehicle
Year: 08/2017 – 11/2017
13. Thitipong Sansanayuth (internship)
Title: Navigation control of an intelligent carrying-medical tool assistant robot
Year: 09/2016-02/2017
14. Owais Arshad Sohail (Karlstad University; Supervisor)
Title: Object Oriented Failure Modes & effect Analysis : Climate System of Hybrid Vehicles
Year: 03/2015

15. Waqas Ahmad (Karlstad University; Examiner)
Title: Development of algorithm for li-ion batteries in electric vehicles, taking into account SOC, charge control, cell balancing and SOF.
Year: 06/2014
16. Florian Markus Faessler (Karlstad University; Supervisor)
Title: Iterative Learning Control of Fast Switching On/Off Valves in Digital Hydraulic Drives
Year: 03/2014
17. Muhammad Awais (Karlstad University; Examiner)
Title: Simulative comparison of Kalman filters for state estimation of Li-ion batteries in electric vehicles
Year: 02/2014
18. Faisal Mahmood Ahmed (Karlstad University; Supervisor)
Title: Estimated Droop Control for Parallel Connected Voltage Source Inverters
Year: 12/2013
19. Md Mafizul Islam and Md Abdul Salam (Karlstad University; Supervisor)
Title: Modelling and Control System design to control Water temperature in Heat Pump
Year: 12/2013
20. Syed Hammad Zafar (Karlstad University; Supervisor)
Title: Modelling and Control of Large Wind Turbin
Year: 10/2013
21. Kaviraj Murugesan (Karlstad University; Supervisor)
Title: Damage detection on railway bridges using system identification
Year: 06/2013
22. Zeeshan Iqbal (Karlstad University; Supervisor)
Title: Wireless Sensor and Actuator Networks for Real-time Communication
Year: 08/2012
23. TAKEUCHI Masaki (Waseda University; Co-supervisor)
Title: Research on the Anthropomorphic Saxophone Robot: Implementation of a pitch control system for a MIMO system based on FB Error Learning (in Japanese)
Year: 02/2010
24. YAMAMOTO Tetsuro (Waseda University; Co-supervisor)
Title: Research on the Anthropomorphic Saxophone Robot: Implementation of an air pressure control and false tone removal system based on the FB Error Learning (in Japanese)
Year: 02/2009
25. SHIMOMURA Akihiro (Waseda University; Co-supervisor)
Title: Implementation of an Airway Management Scenario Training: Development of Supporting System for the construction of training scenario (in Japanese)
Year: 02/2009
26. KOGA Hiroki (Waseda University; Co-supervisor)
Title: Development of an Oral-Rehabilitation Robot: Development of an automatic palpate algorithm for detection of massage treatment position (in Japanese)
Year: 02/2009
27. NINOMIYA Takeshi (Waseda University; Co-supervisor)
Title: Research on the Anthropomorphic Saxophonist Robot: Development of an air pressure control and performance system (in Japanese)
Year: 02/2008
28. OSHIMA Nobuki (Waseda University; Co-supervisor)
Title: Research on the Virtual Patient Robot and Training System: Development of a Suture Training System (in Japanese)
Year: 02/2008
29. NOH Yohan (Waseda University; Co-supervisor)
Title: Development of an Airway Training Management System (in Japanese)
Year: 08/2007
30. TANIGUCHI Koichi (Waseda University; Co-supervisor)
Title: Research on the Anthropomorphic Flutist Robot: Implementation of an air flow control and aural feedback performance system (in Japanese)
Year: 02/2007
31. SUEFUJI Kei (Waseda University; Co-supervisor)
Title: Research on the Anthropomorphic Flutist Robot: Generation of musical performance data to produce a intonated performance (in Japanese)
Year: 02/2006

Undergraduate Students

1. Arian Borhan, (Karlstad University; Supervisor)
Title: Design and Development of an Automated Coil Winding Machine for Production
Year: 2025
2. Samuel Persson, (Karlstad University; Supervisor)
Title: Analysis of a simulated battery energy storage system used for frequency containment reserve during low and high grid inertia
Year: 2025
3. Oskar Vägermark (Karlstad University; Supervisor)
Title: Identification of incipient contact faults in low-voltage networks using smart meters
Year: 2025
4. Carl Tornberg (Ritsumeikan University; External Supervisor)
Title: Multi-modal Human-Robot Co-adaptive Planning for Collaborative Tasks using Mixed Reality and Artificial Intelligence – Mixed Reality to convey robot plan and status
Year: 06/2023– 09/2023
5. Carl Tornberg (Ritsumeikan University; External Supervisor)
Title: Multi-modal Human-Robot Co-adaptive Planning for Collaborative Tasks using Mixed Reality and Artificial Intelligence – Mixed Reality to convey robot plan and status
Year: 01/2023– 04/2023
6. Mohammad Roointan (Karlstad University; Supervisor)
Title: Korttidsprediktering av producerad energi från solcellsanläggning
Year: 2021
7. Tobias Nordlund (Karlstad University; Supervisor)
Title: Jämförelse av upplösning i lastprediktering med Deep Learning
Year: 2021
8. Joel André (Karlstad University; Supervisor)
Title: Modular Battery Management System interface to integrated Vehicle Control Unit: Creating a BMS playground using Arduino
Year: 2020
9. Ericson, Johan (Karlstad University; Supervisor)
Title: Lastprediktering: Med Neuralt Nätverk och Support Vector Regression
Year: 2019
10. Karlsson, Christoffer (Karlstad University; Supervisor)
Title: Vision based control and landing of Micro aerial vehicles
Year: 2019
11. Pontus Stoltz (Karlstad University; Supervisor)
Title: Analysis of cluster mounted MEMS-Gyroscopes circuitboard of cluster mounted gyroscopes
Year: 2018
12. Mikael Ogenvall (internship)
Title: Assistive Eating Device – Vision System to keep track of user food intake
Year: 05/2017 – 12/2017
13. Christoffer Karlsson (internship)
Title: Assistive Eating Device – Vision System to keep track of user food intake
Year: 05/2017 – 12/2017
14. Fernanda Amaral Melo (internship)
Title: 3D gesture recognition of an intelligent carrying-medical tool assistant robot
Year: 08/2016 – 12/2016
15. Jose Pablo de la Rosa (internship)
Title: System integration of a walking assistive robot vehicle
Year: 08/2014 – 12/2014
16. Tommie Hilmeresson (Karlstad University; Supervisor)
Title: Uppbyggnad och reglering av en pumpstation till ett injektionssystem (in *Swedish*)
Year: 10/2014
17. Johan Hansson (Karlstad University, Supervisor)
Title: Systemanalys flingtork : Produktionseffektivisering (in *Swedish*)
Year: 09/2014
18. Per-Martin Häggström (Karlstad University; Supervisor)
Title: Omkonstruktion av treaxlig plockrobot och dess plockverktyg (in *Swedish*)
Year: 09/2014
19. KUSANO Takafumi (Waseda University; Co-supervisor)

Title: Development of new mouth and finger mechanisms for the Anthropomorphic Saxophone Robot (in Japanese)

Year: 02/2010

20. SUGITA Yoshihisa (Waseda University; Co-supervisor)

Title: Development of an embedded-sensor lips and the lips/mouth mechanisms for saxophone sound production for the Anthropomorphic Flute Robot (in Japanese)

Year: 02/2010

21. ISHIKAWA Shimpei (Waseda University; Co-supervisor)

Title: Development of an Anthropomorphic Saxophone Performance Robot: Development of a new mouth mechanism to increase the sound range and a new hand mechanism (in Japanese)

Year: 02/2009

22. SATO Kei (Waseda University; Co-supervisor)

Title: Development of an Airway Management Training Model (in Japanese)

Year: 02/2009

23. KIKUTA Go (Waseda University; Co-supervisor)

Title: Development of an 3D simulator as a training tool for the Airway Management (in Japanese)

Year: 02/2009

24. EGUCHI Koichi (Waseda University; Co-supervisor)

Title: Development of an Oral-Rehabilitation Robot: Design and construction of an optimal manipulator for the maxillofacial massage (in Japanese)

Year: 02/2009

25. TAKEUCHI Maasaki (Waseda University; Co-supervisor)

Title: Development of the Anthropomorphic Saxophonist Robot: Design/development of a compact air pump and lip/mouth mechanisms (in Japanese)

Year: 02/2008

26. YAMAMOTO Tetsuro (Waseda University; Co-supervisor)

Title: Development of the Anthropomorphic Flutist Robot: Development of a new mouth and tonguing mechanism (in Japanese)

Year: 02/2007

27. NINOMIYA Takeshi (Waseda University; Co-supervisor)

Title: Development of a new mouth and lung mechanism for an Anthropomorphic Flutist Robot (in Japanese)

Year: 02/2006

CONFERENCES ACTIVITIES

2026 PC Co.-chair, IEEE/SICE International Symposium on System Integration

2015-current Associate Editor, International Conference Automation in Science and Engineering

Editor Reviewer, Frontiers in Robotics and AI, Humanoid Robotics

2014-current Associate Editor, International Conference in Control, Automation and Robotics

Associate Editor, Robotics Science and Systems

2013-current Associate Editor, International Journal on Advanced Robotic Systems

2010-current Guest Editor, IEEE-RAS Robotics and Automation Magazine

Associate Editor, IEEE-RAS&EMBS International Conference on Biomedical Robotics and Biomechanics

Associate Editor, IEEE International Conference on Robotics and Automation

Associate Editor, IEEE/RSJ International Conference on Intelligent Robots and Systems

Associate Editor, IEEE/ASME International Conference on Advanced Intelligent Mechatronics

Associate Editor, IEEE International Symposium in Robot and Human Interactive Communication

Co-Organizer, IEEE/RSJ International Conference on Intelligent Robots and Systems , [Workshop on](#)

[Robots and Musical Expressions](#), Taiwan, October 18

2009 Session Chairman, Eighteenth International IEEE Symposium on Robot and Human Interactive

Communication: Robots in Art, Education, and Entertainment. Toyama, Japan, September 27–October 1

Co-Organizer, IEEE International Conference on Intelligent Robots and Systems, [Workshop on](#)

[Biologically-Inspired Robotics](#), St. Louis, USA, October 11

Session Chairman, International IEEE Conference on Intelligent Mechatronics: Service Robots.

Singapore, July 13–17

Co-Organizer, IEEE International Conference on Robotics and Automation, [Workshop on Roboethics](#),

Kobe, Japan, May 17

Co-Chair, IEEE-RAS TC on Biologically Inspired Robots

Chair, 5th Asia-Pacific Computing and Philosophy Conference, Robo Ethics Session, Tokyo, Japan, October 1–2

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1. De Vin, L., Solis, J., **Proceedings of the 14th Mechatronics Forum International Conference Mechatronics 2014** (ISBN 978-91-7063-564-9)
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3. Gianmarco, V., Solis, J., Van der Loos, M. (2011). **RoboEthics**. IEEE Robotics & Automation Magazine, Vol. 18(1) : NY : USA.

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Patents

1. WO/2009/113196: Tracheal intubation training apparatus; Takanishi, A.; Noh, Y.; Solis, J.; Ishii, H.; Ogura, Y.; Nagahiro, K.; Segawa, M.; Shimomura, A.; Katayama, T.; Hatake, K. (patentscope.wipo.int/search/en/detail.jsf?docId=WO2009113196)
2. WO/2009/118933: Massage robot and control program thereof. Takanishi, A., Katsumata, A.; Koga, H., Ishii, H.; Solis, J.; Obokawa, Y. (patentscope.wipo.int/search/en/detail.jsf?docId=WO2009118933)
3. WO/2008/041457: Massage robot and control program therefor and robot for specifying portion of human body. Takanishi, A., Katsumata, A.; Usuda, Y.; Koga, H.; Matsuno, M.; Ogura, Y.; Ishii, H.; Solis, J. (patentscope.wipo.int/search/en/detail.jsf?docId=WO2008041457)
4. WO/2008/041456: Medical technique evaluation system, technique evaluation device, technique evaluation device program. Takanishi, A.; Aizdin, M.; Oshima, N.; Midorikawa, R.; Solis, J.; Ogura, Y.; Ishii, H.0 (patentscope.wipo.int/search/en/detail.jsf?docId=WO2008041456)

INVITED LECTURES & INTERVIEWS (Selected)

1. Invited talk on [Challenges towards Industry 5.0 in controlled environment plant production systems with high proportion of local renewable energy: From system integration to optimization of techno-economical intelligent control systems](#). JSME TC on Robotics and Mechatronics, Tohoku University, November 19th 2024, Sendai, Japan
2. Invited talk on Challenges within Industry 5.0 from research and education perspective. University of Southern Denmark, July 1st, 2022, Odense, Denmark
3. Invited talk on [Biologically-Inspired Design of Musical Humanoid Robots and Its Applications to Human-Robot Interaction](#), 1st IFToMM Japan International Summer School on Mechanical Science and Robotics: Mechanisms, Actuators and Control for Robotics, July 24th, 2018, Tokyo / Yamanashi, Japan
4. Invited talk on [Robotic assistive device with multi-grip tools and vision system for frail elderly's independent life](#), Symposium on Working together for solutions to societal challenges through innovation - Swedish and Japanese academia and industry in collaboration for an active and healthy ageing, June 13th, 2018. Tokyo, Japan
5. Invited talk on [Biologically-Inspired Machine Learning for Humanoid Robots and its Applications](#), Human-Machine Interaction Summer School, Maratea, Italy, September 21st 2017.
6. Invited talk on [Towards the introduction of multimodal welfare robot systems: Development of an assistive mobile robot system](#), 3rd Research Meeting of the Japanese Society of Regenerative medicine and Rehabilitation, Tokyo Institute of Technology, Tokyo Japan, December 10th 2017.
7. Seminar on the Development of human-friendly assistive robot vehicles for the ambient assisted living at Karlstad University, Waseda University, Tokyo Japan, November 2nd, 2015
8. Seminar on [Towards the development of a multi-purpose assistive robot vehicle in the ambient assisted living](#), Jc-IFTToMM, Tokyo, Japan, November 6th, 2015.
9. Seminar on Development of human-friendly assistive robot vehicle for the ambient assisted living, Tokyo Institute of Technology, Tokyo, Japan, November 12th, 2014
10. [Seminar on Some issues in the development of human-friendly robots and their applications](#), Örebro University, Örebro, Sweden, March 3rd, 2013
11. [Seminar on Biologically-Inspired design and control of musical robots to enable physically-embodied expressive musical performances to interact with musicians](#), Royal Institute of Technology, Stockholm, Sweden, December 7th, 2013
12. [Invited talk on Some Issues on Humanoid Robotics Research: Applications and Implications](#), Evolutionary Robotics, Organic Computing and Adaptive Ambience: Epistemological and Ethical Implications of Technomorphic Descriptions of Technologies, Karlsruhe Institute of Technology, Karlsruhe, Germany, October 22nd, 2011
13. [Invited talk on Humanoid Robot Research in Japan: Some Issues on Human Robotic Science and Social Acceptability](#), International Workshop "Future of Robotics in Germany and Japan: Intercultural Perspectives and Technical Opportunities, Dresden University of Technology, Dresden, November 10th, 2010
14. [Seminar on Research Challenges on Human-Robot Interaction and Robotic Human Science](#), Université de Technologie de Compiègne, Compiègne, France, December 4th, 2009.
15. Challenges of Human-Robot Interaction, University Technology of Sydney (UTS), Sydney, Australia, September 28, 2009.
16. [The Development of Anthropomorphic Musical Performance Robots and Their Applications](#), Carnegie Mellon University, Pittsburgh, Pennsylvania, USA, June 4, 2009.

17. From Understanding the Nature of Human Skills to Their Applications to Robotics in Japan, National Taiwan University of Science and Technology, Taipei, Taiwan, April 9, 2009.
18. Can a Humanoid Robot Display Motor Skills for Playing Instruments Like Musicians? Karlsruhe University, Karlsruhe, Germany, September 2008.
19. [Current Robotics Research Topics in Japan: From Medical Robotics to Humanoid Robots](#), McGill University, Montreal, Canada, October 2008.
20. [The Development of the Flutist Robot and its Applications](#), Georgia Institute of Technology, Atlanta, Georgia, USA, August 2008.
21. Haptic Interfaces: Collocation and Coherence Issues. Multipoint interaction in Robotics and Virtual Reality, Workshop given at the International Conference on Robotics and Automation (ICRA), New Orleans, Louisiana, USA, April 27, 2004.

LANGUAGES

Spanish – Mother Tongue
 Italian –Advanced Level
 French – Basic Level

English – Advanced Level
 Swedish – Intermediate Level

Japanese –Intermediate Level
 Portuguese – Basic Level