

Prof Peter Weiliang Xu, PhD

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Chair in Mechatronics Engineering
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Born on 8 Nov 1961 in Jiangsu, China



Scientific Career

- Since 2011 Professor and Chair in Mechatronics Engineering, Department of Mechanical Engineering, The University of Auckland, New Zealand
- 2007 - 2010 Professor of Mechatronics, School of Engineering and Advanced Technology, Massey University, New Zealand
- 2005 - 2006 Associate Professor, School of Engineering and Advanced Technology, Massey University, New Zealand
- 1999 - 2004 Senior Lecturer, School of Engineering and Advanced Technology, Massey University, New Zealand
- 1993 - 1998 Research Assistant Professor, Department of Manufacturing Engineering and Engineering Management, City University of Hong Kong, Hong Kong
- 1990 - 1992 Alexander von Humboldt Research Fellow, Institute of Control Technology for Machine Tools and Manufacturing Units, University of Stuttgart, Germany
- 1988 - 1989 Lecturer, Department of Mechanical Engineering, Southeast University
- 1985 - 1987 PhD in Robotics and Mechatronics, Beijing University of Aeronautics and Astronautics
- 1982 - 1984 ME in Mechanical Engineering, Southeast University, China
- 1978 - 1982 BE in Manufacturing and Automation, Southeast University, China

Scholarships, Awards and Faculty Functions

- Since 2015 Principal Investigator of Interventional Technologies and Platform Leader of Actuation and Control, The New Zealand Medical Technologies Centre of Research Excellence (CoRE), New Zealand
- Since 2015 Associate Investigator of Sensing Techniques, The Dodd-Walls Centre for Photonic and Quantum Technologies, a national CoRE, New Zealand
- Since 2013 Adjunct Professor, Nanjing University of Science and Technology, China
- 2013 Best Conference Paper, RiTA'2013, Denver, USA
- Since 2012 Associate Investigator of Biological Modelling and Simulation, Riddet Institute, a national CoRE in Food, Innovation and Health, New Zealand
- 2011 - 2013 Adjunct Professor, Massey University, New Zealand

2010 & 2012	Adjunct Professor, Jilin University, China
2010 & 2014	Guest Editor, International Journal of Computer Applications in Technology
2010	Visiting Professor, Keio University, Japan
2010	Research Fellowship, Japan Society of the Promotion of Sciences (JSPS)
Since 2009	Technical Committee on Sensors and Actuators, IEEE Industrial Electronics Society
Since 2009	Editorial Board Member, International Journal of Biomechanics and Biomedical Robotics (IBBR)
2009 - 2014	Adjunct Professor, Dalian University of Technology, China
2008 - 2009	Associate Editor, IEEE Robotics and Automation Magazine
Since 2008	Adjunct Professor, State Key Laboratory of Robotics, China
2008	General Co-Chair, 15th IEEE International Conference on Mechatronics and Machine Vision in Practice (M2VIP'02), Auckland, New Zealand
2006	Visiting Professor, Daegu University, Korea
2006	Research Fellowship, Korea Federation of Science and Technology (KoFST)
Since 2006	Fellow, Institution of Professional Engineers New Zealand (IPENZ)
Since 2004	Founding Editor/Editorial Board Member, International Journal of Intelligent Systems Technologies and Applications (IJISTA)
Since 2003	Associate Editor, IEEE Transactions on Industrial Electronics
2003	Visiting Professor, University of Siegen, Germany
Since 1999	Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
1996	Young Academic Research Prize, Fuk Ying Tung Education Foundation, Hong Kong
1990	Research Fellowship, Alexander von Humboldt Foundation, Germany

Ten most important publications

* Publications jointly together with UoA-researchers involved within this IRTG

§ Publications jointly together with USTUTT-researchers involved within this IRTG

A) Published in publication outlets with scientific quality assurance and book publications:

1. Cheng, C.; Xu, W.L.; Shang, J.Z.: Distributed Torque Based Independent Joint Tracking Control of a Redundantly Actuated Parallel Robot with Two Higher Kinematic Pairs. IEEE Transactions on Industrial Electronics, 63(2), p. 1063-1070, 2015.
2. Wen, H.Y.; Xu, W.L.; Cong, M.: Kinematic Model and Analysis of an Actuation Redundant Parallel Robot with Higher Kinematic Pairs for Jaw Movement. IEEE Transactions on Industrial Electronics, 62(3), p.1590-1598, 2015.
3. Sun, C.; Xu, W.L.; Bronlund, J.E.; Morgenstern, M.: Dynamics and Compliance Control of a Linkage Robot for Food Chewing. IEEE Transactions on Industrial Electronics, 61(1), p. 377-386, 2014.
4. * Dirven, S.; Xu, W.L.; Cheng, L.K.: Sinusoidal peristaltic waves in soft actuator for mimicry of esophageal swallowing. IEEE/ASME Transactions on Mechatronics, 20(3), p. 1331-1337, 2014.

5. * Driven, S.; Chen, F.J.; Xu, W.L.; Bronlund, J.E.; Allen, J.; Cheng K.L.: Design and characterization of a peristaltic actuator inspired by esophageal swallowing. IEEE/ASME Transactions on Mechatronics, 19(4), p. 1234-1242, 2014.
6. Yang, T.W.; Xu, W.L.; Han, J.D.: Dynamic compensation control of flexible macro-micro manipulator systems, IEEE Transactions on Control System Technologies, 18(1), p. 143-151, 2010.
7. [§]* Xu, W.L.; Bronlund, J.; Potgieter, J.; Foster, K.D.; Röhrle, O.; Pullan, A.J.; Kieser, J.A.: Review of the Human Masticatory System and Masticatory Robotics. Mechanism and Machine Theory, 43(11), p. 1353-1375, 2008.
8. Xu, W.L.; Torrance, J.; Chen, B.; Potgieter, J.; Bronlund, J.E.; Pap, J.S.: Kinematics and Experiments of a Life-sized Chewing Robot for Characterising Food Texture. IEEE Transactions in Industrial Electronics, 55(5), p. 2121-2132, 2008.
9. Xu, W.L.; Pap, J.S; Bronlund, J.E.: Design of a Biologically Inspired Robot for Foods Chewing. IEEE Transactions on Industrial Electronics, 55(2), p. 832-841, 2008.
10. Xu, W.L.; Bronlund, J.E.: Mastication Robots, from Biological Inspiration to Implementation, Springer, Heidelberg & Berlin. 300p, 2010.

B) Other publications

C) Patents

1. Xu, W.L.; Stommel, M.; Lim P.K.: Peristaltic XY Table for Sorting of Animal Offal, New Zealand Provisional Patent, #627425, 2014
2. Xu, W.L.; Dirven, S.; Chen, F.J.; Bronlund, J.: Fluidic Asserated Peristaltic Actuator, New Zealand Patent, #607834, 2012.
3. Pau J.; Chen T.; Xie, S.Q.; Xu, W.L.: A Neuromuscular Interface for Robot-assisted Healthcare, New Zealand Patent, #598895, 2012.

Supervised graduate students since graduation year 2011

No.	Last Name, First Name	Degree	Title of the dissertation	Duration of thesis
1	Torrance, Jonathan	PhD	Motion Control of a Robotic Jaw for Reproducing Chewing Behaviors	2006-2011
2	Sun, Cheng	PhD	Analysis, Modelling and Control of a Linkage Chewing Machine and its Application in Food Evaluation	2008-2012
3	Wang, Xiaoyun	PhD	Jaw Exoskeleton for Rehabilitation of Jaw Motion Disorders	2009 - 2014
4	Emerson, Iain	PhD	Hybrid Robotic and Mirror System for Neurological Rehabilitation	2009 - 2014
5	Yu, Xuefeng	PhD	Dynamic Programming Based Coordinated Ramp Metering Algorithms	2010 - 2014
6	Pham, Cao Van	PhD	Intelligent Control of Interchange Signals	2010-2014
7	Chen, Feijiao	PhD	A Swallowing Robot for Studying the Effect of Food Bolus Properties on the Swallowing	2010-2014

8	Dirven, Steven	PhD	Modelling, Sensing and Control of a Peristaltic Actuator Inspired by Esophageal Swallowing	2011 - 2014
9	Huo, Benya	PhD	Modelling, Motion Planning and Experiment of a Flexible Needle for Medical Applications	2012 -
10	Zhu, Mingzhu	PhD	Central Pattern Generator Based Involuntary Peristalsis Control of a Swallowing Device	2012 -
11	Cheng, Chen	PhD	Dynamics Control of an Actuation Redundant Parallel Masticatory Robot	2012 -
12	Singh, Jas	PhD	FPI and FBG Integrated Fiber Optic Sensor for Smart Medical Tools	2012 -
13	Mo, Zonglai	PhD	Fiber Optic Tool-tip Tactile Sensing for Smart Surgical Tools	2013 -
14	Lu, Xuanming	PhD	Soft-bodied Robotic Tongue	2014 -
15	Deng, Zhichong	PhD	Soft-bodied Peristaltic XY Table	2014 -
16	Xie, Li	PhD	Energy-optimal Navigation of a Mecanum Wheeled Omni-directional Robot	2014 -
17	Kutia, James	PhD	Unmanned Aerial Vehicle Based Aerial Manipulation	2014 -
18	Abdul Din, Sattar	PhD	Development of Deformable Array of Strain and Tactile Sensors for Biomimetic Esophageal Swallowing Robot	2014
19	Chen, Hao	PhD	A Miniature Fiber Optic Raman Sensor for In Vivo Non-contact Nerve Detection in Minimally Invasive Spine Surgeries	2014
20	Heshen, Ryman	PhD	Biomimicry of Human Gastric Motility Soft-Bodied Robot	2015
21	Dang, Yu	PhD	A Pneumatically Actuated Soft Robot Mimicking the Human Gastric Motility	2015

Most important research grants since 2011

No.	Research Project	Funding Period	Name(s) of the principal investigator(s)	Funding source and reference number
1	Medical Technologies CoRE (Centre of Research Excellence)	2015 - 2020	Hunter, P.J. Xu, W.L. others	Tertiary Education Committee

2	Dodd-Wall Centre for Photonic and Quantum Technologies(Centre of Research Excellence)	2015 - 2020	Hutchinson, D. Xu, W.L. others	Tertiary Education Committee
3	Riddet Institute (Centre of Research Excellence)	2016-2020	Moughanm P. Xu, W.L. others	Tertiary Education Committee
4	Development of New Zealand-Germany Mechatronics Research Relationship	2013 - 2014	Xu, W.L..	Ministry of Business, Innovation and Employment
5	A Clinically Significant Biomimetic Swallowing Robot	2012 - 2014	Xu, W.L.	University of Auckland
6	Robot-assisted Flexible Needle Percutaneous Insertion for Minimally Invasive Surgery	2012 - 2016	Xu, W.L.	National Natural Science Foundation, China
7	Enabling Technologies for Wearable Assistive Devices	2009 - 2012	Xu, W.L. Pullan, A.J. Xie, S.Q. others	Ministry of Business, Innovation and Employment