

Wai On Wong
Associate Professor
Department of Mechanical Engineering
Email: wai.on.wong@polyu.edu.hk
Phone: 27666667

Qualifications

Master of Science in Precision Engineering, Hong Kong Polytechnic
Bachelor of Engineering in Mechanical Engineering, Hong Kong Polytechnic
Doctor of Philosophy, The Hong Kong Polytechnic University
15 Jan 1999 → ... Member of the Hong Kong Institution of Engineers, Member of the Hong Kong Institution of Engineers
27 Nov 1998 → ... Chartered Engineer, Chartered Engineer
14 Oct 1998 → ... Member of the Institution of Mechanical Engineers, Member of the Institution of Mechanical Engineers

Employment

Associate Professor
Associate Professor
Department of Mechanical Engineering
The Hong Kong Polytechnic University
1 Jul 1999 → present

Research outputs

Optimal Design of Maxwell-Viscous Coulomb Air Damper with a Modified Fixed Point Theory
Wong, W. O. & Wong, C. N., 1 Jun 2021, In: Journal of Vibration and Acoustics, Transactions of the ASME. 143, 3, 031002.

Power compensation mechanism for AMB system in magnetically suspended flywheel energy storage system
Xiang, B. & Wong, W., Mar 2021, In: Measurement: Journal of the International Measurement Confederation. 173, 108646.

Decoupling control of magnetically suspended motor rotor with heavy self-weight and great moment of inertia based on internal model control
Xiang, B. & Wong, W., 24 Feb 2021, (E-pub ahead of print) In: JVC/Journal of Vibration and Control.

Active disturbance rejection control of test sample in electrostatic suspension system
Xiang, B., Guo, Q. & Wong, W., 1 Feb 2021, In: Mechanical Systems and Signal Processing. 148, 107187.

Tunable electromagnetic shunt damper with opposing magnets configuration
Sun, R., Wong, W. & Cheng, L., Nov 2020, In: Smart Materials and Structures. 29, 11, abb21d.

Coupling Analysis and Cross-Feedback Control of Three-Axis Inertially Stabilized Platform with an Active Magnetic Bearing System
Wen, T., Xiang, B. & Wong, W., 22 Jul 2020, In: Shock and Vibration. 2020, 8290369.

Electromagnetic vibration absorber for torsional vibration in high speed rotational machine
Xiang, B. & Wong, W., Jun 2020, In: Mechanical Systems and Signal Processing. 140, 106639.

Gimbal torque and coupling torque of six degrees of freedom magnetically suspended yaw gimbal
Tong, W., Xiang, B. & Wong, W. O., Feb 2020, In: International Journal of Mechanical Sciences. 168, 105312 .

Stable control of magnetically suspended motor with heavy self-weight and great moment of inertia

Xiang, B. & Wong, W. O., 2020, (Accepted/In press) In: ISA Transactions.

Vibration Control with a Tunable Self-Sensing Electromagnetic Shunt Damper

Sun, R. & Wong, W., Oct 2019, *2019 23rd International Conference on Mechatronics Technology, ICMT 2019*. Institute of Electrical and Electronics Engineers Inc., 8932148. (2019 23rd International Conference on Mechatronics Technology, ICMT 2019).

Vibration characteristics analysis of magnetically suspended rotor in flywheel energy storage system

Xiang, B. & Wong, W. O., 31 Mar 2019, In: Journal of Sound and Vibration. 444, p. 235-247 13 p.

Suspension Characteristics of Magnetically Suspended Frame in Inertially Stabilized Platform

Xiang, B. & Wong, W., 3 Nov 2018, *Proceedings - 2018 IEEE 18th International Conference on Power Electronics and Motion Control, PEMC 2018*. Institute of Electrical and Electronics Engineers Inc., p. 776-783 8 p. 8521921. (Proceedings - 2018 IEEE 18th International Conference on Power Electronics and Motion Control, PEMC 2018).

Design optimization of a viscoelastic dynamic vibration absorber using a modified fixed-points theory

Wong, W. O., Fan, R. P. & Cheng, F., 1 Feb 2018, In: Journal of the Acoustical Society of America. 143, 2, p. 1064-1075 12 p.

Optimal design of a beam-based dynamic vibration absorber using fixed-points theory

Hua, Y., Wong, W. O. & Cheng, L., 1 Jan 2018, In: Journal of Sound and Vibration. 421, p. 111-131 21 p.

Hybrid vibration absorber with detached design for global vibration control

Tso, M. H., Yuan, J. & Wong, W. O., 1 Dec 2017, In: JVC/Journal of Vibration and Control. 23, 20, p. 3414-3430 17 p.

The mass Ratio's and the primary structure damping Ratio's effects on the dynamic characters of the MTMDs device

Hua, Y., Wong, W. O. & Cheng, L., 1 Jan 2017, *INTER-NOISE 2017 - 46th International Congress and Exposition on Noise Control Engineering: Taming Noise and Moving Quiet*. Institute of Noise Control Engineering

Optimal design of a hysteretic vibration absorber using fixed-points theory

Wong, W. O., 1 Jun 2016, In: Journal of the Acoustical Society of America. 139, 6, p. 3110-3115 6 p.

Hybrid vibration absorber with detached design for global vibration control

Tso, M. H., Yuan, J. & Wong, W. O., 2016, In: Journal of vibration and control. p. 1-17 17 p.

Minimization of impulse response of dynamic structures using a ground-hooked dynamic vibration absorber

Cheung, Y. L. & Wong, W. O., 2016, In: International journal of mechanical systems engineering. 2, p. 1-3 3 p.

A subsystem approach for analysis of dynamic vibration absorbers suppressing broadband vibration

Cheung, Y. L., Wong, W. O. & Cheng, L., 1 Jan 2015, In: Journal of Sound and Vibration. 342, p. 75-89 15 p.

A novel Fourier-Eight-Sensor (F8S) method for separating straightness, yawing and rolling motion errors of a linear slide

Fung, E. H. K., Zhu, M., Zhang, X. Z. & Wong, W. O., 1 Jan 2014, In: Measurement: Journal of the International Measurement Confederation. 47, 1, p. 777-788 12 p.

Simulation, prediction and compensation of transient thermal deformations of a reciprocating linear slide for F8s motion error separation

Fung, H. K. E., Hou, N., Yu, H. F. & Wong, W. O., 2014, [Missing Source Name from PIRA]. Avestia Publishing

A novel method for on-machine determination of slide motion errors considering thermal effects

Fung, E. H. K., Hou, N. J., Zhu, M. & Wong, W. O., 29 Oct 2013, *Information Technology for Manufacturing Systems IV*. p. 157-162 6 p. (Applied Mechanics and Materials; vol. 421).

Profile estimation of linear slide in the presence of straightness, yawing and rolling motion errors

Fung, E. H. K., Zhang, X. Z., Zhu, M. & Wong, W. O., 29 Oct 2013, *Information Technology for Manufacturing Systems IV*. p. 444-448 5 p. (Applied Mechanics and Materials; vol. 421).

Optimization of a hybrid vibration absorber for vibration control of structures under random force excitation

Cheung, Y. L., Wong, W. O. & Cheng, L., 4 Feb 2013, In: *Journal of Sound and Vibration*. 332, 3, p. 494-509 16 p.

Design and experimental study of a hybrid vibration absorber for global vibration control

Tso, M. H., Yuan, J. & Wong, W. O., 1 Jan 2013, In: *Engineering Structures*. 56, p. 1058-1069 12 p.

Modal power flow analysis of a damaged orthotropic plate

Wong, W. O., Cheung, Y. & Cheng, L., 1 Jan 2013, In: *Advances in Structural Engineering*. 16, 1, p. 115-125 11 p.

A modal energy method for dynamic force identification

Mao, C., Wong, W. O. & Cheng, L., 2013, p. 1028-1033. 6 p.

A novel integrated sensing system (ISS) for monitoring motion errors of a precision linear slid

Fung, E. H. K., Hou, N. J., Zhu, M. & Wong, W. O., 1 Dec 2012, *ASME 2012 International Mechanical Engineering Congress and Exposition, IMECE 2012*. Vol. 10. p. 17-24 8 p.

Minimization of the mean square velocity response of dynamic structures using an active-passive dynamic vibration absorber

Cheung, Y. L., Wong, W. O. & Cheng, L., 1 Jul 2012, In: *Journal of the Acoustical Society of America*. 132, 1, p. 197-207 11 p.

Suppression of random vibration in flexible structures using a hybrid vibration absorber

Tso, M. H., Yuan, J. & Wong, W. O., 27 Feb 2012, In: *Journal of Sound and Vibration*. 331, 5, p. 974-986 13 p.

Design optimization of a damped hybrid vibration absorber

Cheung, Y. L., Wong, W. O. & Cheng, L., 13 Feb 2012, In: *Journal of Sound and Vibration*. 331, 4, p. 750-766 17 p.

Minimization of impulse response using hybrid dynamic vibration absorber

Cheung, Y., Wong, W. O. & Cheng, L., Dec 2011, *Dynamics for sustainable engineering : proceedings of the 14th Asia-Pacific Vibration Conference, 5-8 December 2011, Hong Kong*. Department of Civil and Structural Engineering and Department of Mechanical Engineering, The Hong Kong Polytechnic University.

Modal power flow analysis of a damaged composite plate

Wong, W. O., Cheung, Y. L. & Cheng, L., Dec 2011, *Dynamics for sustainable engineering : proceedings of the 14th Asia-Pacific Vibration Conference, 5-8 December 2011, Hong Kong*. Department of Civil and Structural Engineering and Department of Mechanical Engineering, The Hong Kong Polytechnic University.

Turbulent flow structure and swirl number effect in a cyclone

Wang, X. W., Zhou, Y. & Wong, W. O., 10 Nov 2011, In: *Journal of Fluids Engineering, Transactions of the ASME*. 133, 11, 111103.

H-infinity optimization of a variant design of the dynamic vibration absorber - Revisited and new results

Cheung, Y. L. & Wong, W. O., 1 Aug 2011, In: *Journal of Sound and Vibration*. 330, 16, p. 3901-3912 12 p.

H₂ optimization of a non-traditional dynamic vibration absorber for vibration control of structures under random force excitation

Cheung, Y. L. & Wong, W. O., 14 Mar 2011, In: *Journal of Sound and Vibration*. 330, 6, p. 1039-1044 6 p.

A novel integrated sensing system for monitoring CMM motion errors

Fung, E. H. K., Hou, N. J., Zhu, M. & Wong, W. O., 2011.

An improved fourier eight-sensor (F8S) method for separating straightness, yawing and rolling errors of a linear slide

Fung, E. H. K., Zhu, M., Zhang, X. Z. & Wong, W. O., 1 Dec 2010, *ASME 2010 International Mechanical Engineering Congress and Exposition, IMECE 2010*. PARTS A AND B ed. Vol. 3. p. 371-378 8 p.

A simple heterodyne temporal speckle-pattern interferometer

Wong, W. O., Gao, Z. & Lu, J., 20 Jul 2010, *9th International Conference on Vibration Measurements by Laser and Noncontact Techniques and Short Course*. Vol. 1253. p. 410-414 5 p.

Damage detection in plate structures using modal power flow analysis

Liu, X., Wong, W. O. & Cheng, L., 20 Jul 2010, *9th International Conference on Vibration Measurements by Laser and Noncontact Techniques and Short Course*. Vol. 1253. p. 150-154 5 p.

An on-machine separation method for straightness, yawing and rolling errors of a linear slide

Fung, E. H. K., Wong, W. O. & Zhu, M., 1 Jan 2010, *Proceedings of the ASME International Mechanical Engineering Congress and Exposition 2009, IMECE 2009*. American Society of Mechanical Engineers (ASME), Vol. 4. p. 105-114 10 p.

Modal power flow with application to damage detection

Wang, X. Q., Wong, W. O. & Cheng, L., 1 Apr 2009, In: *International Journal of Engineering Science*. 47, 4, p. 512-523 12 p.

H[∞] and H₂ optimizations of a dynamic vibration absorber for suppressing vibrations in plates

Cheung, Y. L. & Wong, W. O., 6 Feb 2009, In: *Journal of Sound and Vibration*. 320, 1-2, p. 29-42 14 p.

Modal power flow analysis of a damaged plate

Wong, W. O., Wang, X. Q. & Cheng, L., 6 Feb 2009, In: *Journal of Sound and Vibration*. 320, 1-2, p. 84-100 17 p.

Structural vibration control with hybrid vibration absorbers

Tso, M. H., Yuan, J. & Wong, W. O., 2009.

Critical speed determination of rotating structures with an optical technique

Wong, W. O., 1 Dec 2008, *IMAC-XXVI: Conference and Exposition on Structural Dynamics - Technologies for Civil Structures*.

Optimization of dynamic vibration absorbers for vibration suppression in plates

Cheung, Y. L. & Wong, W. O., 1 Dec 2008, *IMAC-XXVI: Conference and Exposition on Structural Dynamics - Technologies for Civil Structures*.

Temperature field measurement of a premixed butane/air slot laminar flame jet with Mach-Zehnder Interferometry

Qi, J. A., Wong, W. O., Leung, C. W. & Yuen, D. W., 1 Oct 2008, In: *Applied Thermal Engineering*. 28, 14-15, p. 1806-1812 7 p.

Isolation of bending vibration in a beam structure with a translational vibration absorber and a rotational vibration absorber

Cheung, Y. L. & Wong, W. O., 1 Aug 2008, In: *JVC/Journal of Vibration and Control*. 14, 8, p. 1231-1246 16 p.

Optimal design of a damped dynamic vibration absorber for vibration control of structure excited by ground motion

Wong, W. O. & Cheung, Y. L., 1 Jan 2008, In: *Engineering Structures*. 30, 1, p. 282-286 5 p.

Turbulent flow structure in a cylinder-on-cone cyclone

Wong, W. O., Wang, X. W. & Zhou, Y., 1 Sep 2007, In: *Journal of Fluids Engineering, Transactions of the ASME*. 129, 9, p. 1179-1185 7 p.

Design of a dynamic vibration absorber for vibration isolation of beams under point or distributed loading

Wong, W. O., Tang, S. L., Cheung, Y. L. & Cheng, L., 3 Apr 2007, In: Journal of Sound and Vibration. 301, 3-5, p. 898-908 11 p.

Effect of an oscillating cylinder on flow in a cylinder array

Lai, W., Zhou, Y., Wong, W. O. & Wang, X. W., 2007, In: Dynamics of continuous, discrete & impulsive systems. Series B, Applications & algorithms. 14, S8, p. 63-77 15 p.

Temperature-field measurements of a premixed butane/air circular impinging-flame using reference-beam interferometry

Qi, J. A., Leung, C. W., Wong, W. O. & Probert, S. D., 1 Jan 2006, In: Applied Energy. 83, 12, p. 1307-1316 10 p.

Simulation of turbulent flow and forced convection in a triangular duct with internal ribbed surfaces

Luo, D. D., Leung, C. W., Chan, T. L. & Wong, W. O., 15 Sep 2005, In: Numerical Heat Transfer; Part A: Applications. 48, 5, p. 447-459 13 p.

Flow and forced-convection characteristics of turbulent flow through parallel plates with periodic transverse ribs

Luo, D. D., Leung, C. W., Chan, T. L. & Wong, W. O., 1 Jul 2005, In: Numerical Heat Transfer; Part A: Applications. 48, 1, p. 43-58 16 p.

Effect of fuel nozzle condition on vehicle exhaust emissions

Cheung, C. S., Tsang, K. S., Wong, W. O., Leung, T. Y. & Fung, M. K., 2005, *Proceedings of the Seventh China and Korea International Conference on Internal Combustion Engines and Automotive Engineering, Hangzhou, China, April, 2005*.

Flow measurement in a cyclone using PIV and LDA

Wong, W. O., Wang, X. W. & Zhou, Y., 2005.

Numerical study of turbulent flow in a triangular duct with internal ribbed surfaces

Luo, D. D., Leung, C. W., Chan, T. L. & Wong, W. O., 2005.

PIV study of flow characteristics in a triangular duct with internal ribbed surfaces

Luo, D. D., Leung, C. W., Chan, T. L. & Wong, W. O., 2005.

Numerical analysis of multi-layer composite plates with internal delamination

Yam, L. H., Wei, Z., Cheng, L. & Wong, W. O., 1 Mar 2004, In: Computers and Structures. 82, 7-8, p. 627-637 11 p.

Simple full-field method for the elastic characterization of orthotropic composite plates

Wong, W. O., Feng, P., Reid, S. R. & Chan, K. T., 1 Jan 2004, In: AIAA Journal. 42, 11, p. 2216-2224 9 p.

Comparison of emissions from a light duty diesel vehicle using aged and new fuel injectors

Tsang, K. C., Cheung, C. S., Wong, W. O., Leung, T. Y. & Fung, M. K., 2004, *Proceedings of the Seventh Asia Pacific International Symposium on Combustion and Energy Utilization, Hong Kong, 15-17 December, 2004*.

Enhanced turbulent forced convection of triangular duct with internal ribbed surfaces

Luo, D. D., Leung, C. W., Chan, T. L. & Wong, W. O., 2004, *Proceedings of the Seventh Asia-Pacific International Symposium on Combustion and Energy Utilization (7th APISCEU), The Hong Kong Polytechnic University, Hong Kong, December 15-17, 2004*.

Experimental investigation of the flow structure in a cyclone separator

Wong, W. O., Wang, X. W., Lo, K. K., Cheung, C. S. & Whitelaw, J. H., 2004, *Proceedings of the Seventh Asia-Pacific International Symposium on Combustion and Energy Utilization, Hong Kong, SAR, December 15-17, 2004*.

Experimental study of the separation efficiency of a cyclone based diesel particulate separator

Wong, W. O., Wang, X. W., Lo, K. K., Cheung, C. S. & Whitelaw, J. H., 2004, *Proceedings of the Seventh Asia-Pacific International Symposium on Combustion and Energy Utilization, Hong Kong, SAR, December 15-17, 2004.*

Flow structure around a finite-length square prism

Wang, H. F., Zhou, Y., Chan, C. K., Wong, W. O. & Lam, K. S., 2004.

Author's reply to comments on "The effects of distributed mass loading on plate vibration behaviour"

Wong, W. O., 2003, In: *Engineering Structures*. 264, 4, p. 982 1 p.

Parallel computing for lattice Monte Carlo simulation of large-scale thin film growth

Shu, J., Zheng, W., Lu, Q., Huang, H. & Wong, W. O., 1 Dec 2002, In: *Science in China, Series F: Information Sciences*. 45, 2, p. 103-110 8 p.

Sensitivity studies of parameters for damage detection of plate-like structures using static and dynamic approaches

Yam, L. H., Li, Y. Y. & Wong, W. O., 1 Nov 2002, In: *Engineering Structures*. 24, 11, p. 1465-1475 11 p.

Identification of damage locations for plate-like structures using damage sensitive indices: Strain modal approach

Li, Y. Y., Cheng, L., Yam, L. H. & Wong, W. O., 1 Sep 2002, In: *Computers and Structures*. 80, 25, p. 1881-1894 14 p.

A simple electronic speckle shearing interferometer

Wong, W. O., 1 Jul 2002, In: *Optics and Laser Technology*. 34, 5, p. 399-403 5 p.

Parallelization strategies for Monte Carlo simulations of thin film deposition

Shu, J. W., Lu, Q., Wong, W. O. & Huang, H., 15 Mar 2002, In: *Computer Physics Communications*. 144, 1, p. 34-45 12 p.

Fluctuating temperature measurement on a cylinder in a cross flow using fibre-optic bragg grating sensors

Wang, Z. J., Wang, X. W., Zhou, Y. & Wong, W. O., 2002.

Parallel Monte Carlo simulation of multi-lattice thin film growth

Shu, J. W., Lu, Q., Wong, W. O. & Huang, H. C., 27 Jul 2001, In: *Proceedings of SPIE - The International Society for Optical Engineering*. 4528, 1, p. 98-108 11 p.

A modified Hilbert transformation method for fringe pattern analysis

Wong, W. O., Chan, M. S. M., Chan, K. T. & So, R. M. C., 1 Jan 2001, In: *Proceedings of SPIE - The International Society for Optical Engineering*. 4317, p. 424-428 5 p.

A vibration method for structural damage identification

Ng, K. K., Wong, W. O., Reid, S. R. & Chan, K. T., 2001, p. 1653-1660. 8 p.

Detection of crack damage in composite laminates using smart material and wavelet analysis

Yan, Y. J., Yam, L. H., Li, Y. Y. & Wong, W. O., 2001, p. 2349-2356. 8 p.

Vibration analysis of structures with a weakened support

Wong, W. O., Reid, S. R., Chan, K. T. & Ng, K. K., 2001, p. 3117-3122. 6 p.

Vibration analysis of annular plates using mode subtraction method

Wong, W. O., Yam, L. H., Li, Y. Y., Law, L. Y. & Chan, K. T., 11 May 2000, In: *Journal of Sound and Vibration*. 232, 4, p. 807-822 16 p.

Particle image aberrations in off-axis holography

Chan, K. T., So, R. M. C., Wong, W. O. & Li, Y. J., 2000, p. 1-10. 10 p.

Visualization of Dynamic Stress and Strain Fields in Plate Vibrations

Wong, W. O., 1 Jan 1999, In: Computer Applications in Engineering Education. 7, 2, p. 99-106 8 p.

Vibration Analysis of a Sonic Toothbrush

Wong, W. O., 1999

Vibration-mode Shape Visualization with a Time Average TV Holography System

Wong, W. O., 1 Dec 1998, In: International Journal of Engineering Education. 14, 4, p. 241-247 7 p.

Measurement of modal damping by electronic speckle shearing interferometry

Wong, W. O. & Chan, K. T., 1 Jan 1998, In: Optics and Laser Technology. 30, 2, p. 113-120 8 p.

Quantitative vibration amplitude measurement with time-averaged digital speckle pattern interferometry

Wong, W. O. & Chan, K. T., 1 Jan 1998, In: Optics and Laser Technology. 30, 5, p. 317-324 8 p.

Identification of antinodes and zero-surface-strain contours of flexural vibration with time-averaged speckle pattern shearing interferometry

Wong, W. O., Chan, K. T. & Leung, T. P., 1 Jun 1997, In: Applied Optics. 36, 16, p. 3776-3784 9 p.

Contrast and sensitivity of the vibration fringes in time-averaged electronic speckle-pattern interferometry: Effect of variations of force level

Wong, W. O., Chan, K. T. & Leung, T. P., 1 Jan 1997, In: Optics and Laser Technology. 29, 4, p. 179-185 7 p.

Vibration analysis by laser speckle correlation

Wong, W. O., 1 Jan 1997, In: Optics and Lasers in Engineering. 28, 4, p. 277-286 10 p.

Free vibration of simply supported beam partially loaded with distributed mass

Chan, K. T., Leung, T. P. & Wong, W. O., 11 Apr 1996, In: Journal of Sound and Vibration. 191, 4, p. 590-597 8 p.

Projects

Activities

Pressure Equipment Advisory Committee, Boilers and Pressure Vessels Authority, HKSAR (External organisation)

Wai On Wong (Member)

Jan 2019 → Dec 2020

Consultancy Projects

2020	Consultancy report: 'Geometrical Tolerance and weight analyses of Mark Six Lottery Balls' for The Hong Kong Jockey Club (P18-0435)Lorem ipsum dolor sit amet
2019	Consultancy report: 'Geometrical Tolerance and weight analyses of Mark Six Lottery Balls' for The Hong Kong Jockey Club (P18-0435) dolor sit amet
2018	Consultancy report: 'Geometrical Tolerance and weight analyses of Mark Six Lottery Balls' for The Hong Kong Jockey Club (P16-0425)
2017	Consultancy report: 'Geometrical Tolerance and weight analyses of Mark Six Lottery Balls' for The Hong Kong Jockey Club (P16-0425)
2016	Consultancy report: 'Geometrical Tolerance and weight analyses of Mark Six Lottery Balls' for The Hong Kong Jockey Club (P15-0397)