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Ph.D, Associate Professor,
Associate Dean

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Research Directions

Train braking system design and theory; Braking control & active safety; Intelligent system & fault diagnosis

Education background

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| March 2002 – July 2005 | Shanghai Jiaotong University. Ph.D, Instrument science and technology
Thesis Topic: Key techniques of miniature bionic creeping robotic system and experimental research/Research focus on the microrobot technology and control theory (for phd degrees) |
| Sept. 1999 –Feb. 2002 | Southwest Jiaotong University. Master, Vehicle engineering. Thesis Topic: Study on the wheelset geometric parameters test platform based on non-contact and automatical measurement method. /Research focus on the testing and control technology (for master degrees) |
| Sept. 1995 –July 1999 | Southwest Jiaotong University. Bachelor degree, Vehicle engineering
Thesis Topic: Railway wagon boxcar design (for bachelor degrees) |

Work Experience

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| Dec. 2012-Now | Institute of Railway Transit, Tongji University. Associate professor, Assistant to the Dean |
| Apr. 2008-Nov. 2012 | Institute of Railway Transit, Tongji University. Lecturer |
| Sept. 2005-March 2008 | Shanghai SIMTEK new technology Co., Ltd. Technology research and project management. |
| Nov.2004-Jun 2005 | Precision Engineering Laboratory, GE GRC Shanghai. |

Projects Experience

In charge of two project of National Natural Science Foundation of China, one project of National Hi-tech Research and Development Program of China (863 Program), two projects of National Science and Technology Support Program, one project of Shanghai Natural Science Foundation, one project of Shanghai Education Development Fund and the Foundation to Promote Scientific and Technological Achievements in Shanghai, one project of Shanghai Economic Information

Commission Special Foundation, one project of Fundamental Research Funds for the Central Universities Project, three projects of State Key Laboratory of topics, one project of Development of Young talents of Tongji University and five projects of cooperation between university and enterprise.

Part of two projects of National Natural Science Foundation of China, two projects of National Science and Technology Support Program, one project of National Hi-tech Research and Development Program of China (863 Program), five projects of Ministry of Railways key program, one project of Shanghai Economic Information Commission Special Foundation.

Main projects in recent years:

- [1] General Program of the National Natural Science Foundation of China, "Research on the inducing mechanism and active prevention of abnormal wear of EMU brake disc under extreme snow and ice conditions", No. 51775386. 2018-2021
- [2] State Key Laboratory of topics, "Study on abnormal wear mechanism of brake disc of high and cold EMU under ice and snow environment", No. TPL1706. 2017-2019
- [3] Shanghai Natural Science Foundation, "Inducing mechanism of abnormal wear of arctic EMU brake disc under the extreme snow and ice conditions", No. 16ZR1438700. 2016-2019
- [4] National Science and Technology Support Program, "Key technology of interoperability testing for train braking system", No.2015BAG19B02-3, 2015-2017
- [5] National Science and Technology Support Program, "Service safety research on the railway train braking system", No.2015BAG19B01, 2015-2017
- [6] Fundamental Research Fund for the Central Universities Project, "Research on the service efficiency of the braking system driven by the model and the data", No. 2860219030. 2014-2015
- [7] Technical Entrustment Project of Shanghai Rail Transit Testing Technology Co., Ltd., "Experimental study on the control of subway train", No. 28602530346. 2015-2016
- [8] Cooperation projects with CSR Qingdao Sifang Locomotive Co., Ltd. , "Study on the thermal capacity test and speed limit of the friction pair in the two phase of Guangfo Metro Line", No. 28602530235. 2014-2015
- [9] Shanghai Economic Information Commission Special Foundation program. "Trusted embedded software development platform for rail transportation", No. 130407. 2013-2015
- [10] State Key Laboratory of topics, "Research on high-speed train braking and anti-skid control considering wheel-rail adhesion characteristics", No. TPL1308. 2013-2014
- [11] Fundamental Research Fund for the Central Universities Project, "Research on some problems of wind resistance brake suitable for high speed train", No. 2860219022. 2013-2014
- [12] National 863 program, "The urban train braking system fault monitoring and early warning systems based on the robustness", No. 2011AA0503-3. 2012-2014
- [13] Cooperation projects with CSR Qingdao Sifang Locomotive Co., Ltd. , "Analysis and technical research of braking system for urban rail train", No. SF/JS-201342. 2013-2014
- [14] State Key Laboratory of topics, "Research on coupling effects between flow field under-train and brake disc groups of the high-speed train", No. TPL1107. 2011-2012
- [15] Cooperation projects with CSR Qingdao Sifang Locomotive Co., Ltd. , "EMU traction braking Data Processing Software Development", No. 2860219015. 2012-2013
- [16] National Natural Science Foundation of China, "Study in high-speed train brake disk group dynamics characteristic and impact on running trains under complex flow field", No. 61004077. 2011-2013
- [17] Fundamental Research Fund for the Central Universities Project, "Several Issues on Wind resistance braking suitable for high-speed train", No. 2860219022. 2012-2013
- [18] Shanghai Education Development Fund and the Foundation to Promote Scientific and Technological Achievements in Shanghai, "Rail vehicle status monitoring based on wireless sensing", No. 2860237013. 2011-2012
- [19] Development of Young talents of Tongji University, "Research on key technology of High-speed train anti-skid control", No. 2860219015. 2009-2010

Around 50 papers as the first or corresponding author, including 7 in SCI journal, 30 indexed by EI, 15 indexed by CSCD have been published. There are 12 patents for invention and 8 utility model patents as the first inventor have been authorized. Besides, there are over 20 papers as the second or three co-authors.

The ten major papers in recent years:

- [1] J.Y. Zuo, X.Y. Zhu, M.L. Wu, Numerical simulation of bird impact on composite aerodynamic brake wing of high-speed train. Proceedings of the Institution of Mechanical Engineers, Part F:Journal of Rail and Rapid Transit. 2015.229(3):223-236. (SCI)
- [2] Z.J.Luo,M.L.Wu,J.Y.Zuo,C.Tian.Modelling and model validation of an electropneumatic brake on subway trains. Proceedings of the Institution of Mechanical Engineers, Part F:Journal of Rail and Rapid Transit.2016.230(2):374-391. (SCI)
- [3] Z.J. Luo, J.Y. Zuo, Conjugate heat transfer study on a ventilated disc of high-speed trains during braking. Journal of Mechanical Science and Technology.2014.28(5):1887-1897. (SCI)

- [4] J.Y. Zuo, Z.K. Chen, Sensor Configuration and Test for Fault Diagnoses of Subway Braking System Based on Signed Digraph Method. Chinese Journal of Mechanical Engineering. 2014.27(3):475-482. (SCI)
- [5] J.Y. Zuo, M.L. Wu, et al. Aerodynamic braking device for high-speed trains: Design, simulation, and experiment. Proceedings of the Institution of Mechanical Engineers, Part F:Journal of Rail and Rapid Transit. 2014.228(3):260-270. (SCI)
- [6] J.Y. Zuo, Z.J. Luo, et al, Position Control Optimization of Aerodynamic Brake Device for High-speed Trains. Chinese Journal of Mechanical Engineering. 2014.27(2):287-295. (SCI)
- [7] J.Y. Zuo, F. Han, W. Hu. Reproduction Simulation of Emergency Brake Fault Feature for Subway Train. Journal of Traffic and Transportation Engineering. 2015.15(5):44-49.(EI)
- [8] J.Y. Zuo, X.Y. Zhu, M.L. Wu. Numerical Analysis of Anti-bird Impact Performance of Aerodynamic Brake Wing on High-speed Train. Journal of Vibration and Shock. 2014.33(22):30-34.(EI)
- [9] J.Y. Zuo, Z.J. Luo. Air-pumping Effect Analysis for Brake Disc of High-speed Train. Journal of Traffic and Transportation Engineering. 2014.14(2):34-40.(EI)
- [10]J.Y. Zuo, M.L. Wu, Z.J. Luo. Simulation on Air Flow Field of High Speed Train Concerning the Environment Under Train[J]. Tongji university(Natural science). 2013.11(11):1717-1720. (EI).

Ten conference papers in recent years: :

- [1]J.Y.Zuo,M.L.Wu,H.P.Z.K.Chen.Feedback control of pneumatic brake of urban railway train under ATO mode,2010 International Conference on E-Product E-Service and E-Entertainment, ICEEE2010,Henan,2010.11.7-2010.11.9(EI)
- [2]J.Y.Zuo,Z.K.Chen,H.P.Study on trains' anti-slide simulated system based on ARM,2nd International Conference on Information Science and Engineering, ICISE2010,Hangzhou,2010.12.4-2010.12.6(EI)
- [3]J.Y.Zuo,Y.C.Lu.Simulation on pneumatic brake control of train based on deceleration feedback,4th International Conference on Intelligent Computation Technology and Automation, ICICTA 2011,Shenzhen2011.3.28-2011.3.29(EI)
- [4]J.Y.Zuo,T.P.Chen. Software design of rail transit train braking system fault diagnosis based on MATLAB/VB,2011 International Conference on Multimedia Technology, ICMT 2011,Hangzhou,2011.7.26-2011.7.28(EI)
- [5]Z.K.Chen,J.Y.Zuo.Freeport communication protocol for S7-200 Programmable Controllers,2011 2nd International Conference on Mechanic Automation and Control Engineering, MACE 2011,Inner Mongolia,2011.7.15-2011.7.17(EI)
- [6]Z.J.Luo,J.Y.Zuo,L.G.Zhang. Simulation of hydraulic system with AMESim for aerodynamic brake of highspeed train, 2012 2nd International Conference on Computer Application and System Modeling, ICCASM 2012, shenyang,2012.7.27-2012.7.29(EI)
- [7]X.B.Wu,J.Y.Zuo,M.L.Wu.Heat simulation of high-speed train's brake disc considering the wind speed of disc surface influence on convection coefficient,2012 2nd International Conference on Electronic and Mechanical Engineering and Information Technology, EMEIT 2012, Shenyang, 2012.9.26-2012.9.28(EI)
- [8] Z.M. Wang, J.Y. Zuo, Simulation of wheel slide protection system for railway vehicles. Advanced Information and Computer Technology in Engineering and Manufacturing, Environmental Engineering. Taiwan. 20-24 Dec. 2013.(EI)
- [9] X.Y. Zhu, J.Y. Zuo, Power consumption analysis of high-speed train's brake discs. Advanced Information and Computer Technology in Engineering and Manufacturing, Environmental Engineering. Taiwan. 20-24 Dec. 2013.(EI)
- [10]M.L. Wu, X.Y.Zhu,J.Y.Zuo. Secondary developments of ANSYS for temperature and stress field simulation of brake disc based on VB, 3rd International Conference on Advanced Materials Design and Mechanics, ICAMDM 2014, Singapore, 2014.5.23-2014.5.24(EI)
- [10] J.Y. Zuo*, Z.M. Wang, etc., State Monitoring and Analysis of In-Service Rail Transit Vehicle Braking System. The Second International Conference on Railway Technology: Research, Development and Maintenance. Ajaccio, Corsica, France 8-11 April 2014.

Authorized patents and Software copyright:

- [1] Patent for invention authorized, Railway wheel braking characteristics simulation device. ZL201010275945.6.
- [2] Patent for invention authorized, Pneumatic proportional regulating device based on solenoid valve array. Patent number ZL201110205797.5.
- [3] Patent for invention authorized, Aerodynamic brake control system based on PLC. ZL201210005242.0.
- [4] Patent for invention authorized, A type of hydraulic booster device driven by compressed air. ZL201110168407.1
- [5] Patent for invention authorized, A type of method on Dew point calibration test method for complex environment. ZL 201210559912.3
- [6] Patent for invention authorized, Wind effect and dynamic heat dissipation characteristic test device of high speed train brake disc. ZL201310060446.9
- [7] Patent for invention authorized, Active control device for reducing wind power consumption of high speed train brake disc. ZL201310060353.6
- [8] Patent for invention authorized, Stability device performance test bench for track dynamic stabilizing vehicle. ZL201410051958.3
- [9] Software copyright, Failure algorithm software used to monitor on-line rail train braking system. 2012SR093656

- [10] Software copyright, The configuration software of braking system fault detection equipment based on sensor network. 2012SR096079
- [11] Software copyright, The communication software of braking system fault detection equipment based on sensor network. 2012SR096769
- [12] Software copyright, Fault identification algorithm software of rail train air brake system. 2013SR026558

Teaching & Practice

- Teaching the postgraduate course "Optimization Theory and Methods", the undergraduate course "Hydraulic and pneumatic transmission", and one school core curriculum "CRH EMU Principles and Application";
- Having guided 2 SITP projects and undergraduate thesis projects 14 times, won the title of outstanding instructor of undergraduate thesis projects in 2011;
- The second award of Tongji University Teaching Achievement in 2013;
- Having presided 2 experimental teaching reform project of Tongji University, and one project has finished and awarded the Annual outstanding project in 2011 .

Social works

- Assistant to Dean of Institute of Railway Transit;
- Project reviewer of NSFC Engineering and Materials Science Department of Engineering Science;
- Papers reviewer of journals: Automation in Construction, International Journal of Thermal Sciences, Journal of Vibration and Acoustics, Int. J. of Heavy Vehicle Systems. China Railway Science (EI), Urban rail transit (CSCD) and so on.