
Wei Cheng

Visiting Research Student, Wu Manufacturing Research Center, Department of Mechanical Engineering, University of Michigan, Ann Arbor, USA

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Research Field: Machinery condition monitoring and fault diagnosis &

Blind Source Separation and Independent component analysis.



Education

- Feb. 2011 – present Visiting Research Student, Wu Manufacturing Research Center, Department of Mechanical Engineering, College of Engineering, University of Michigan.
- Sep. 2008- present Ph.D Candidate of Mechanical Engineering, State Key Laboratory for Manufacturing Systems Engineering, Xi'an Jiaotong University.
- Sep. 2006- Sep. 2008 M.S. of Mechanical Engineering, State Key Laboratory for Manufacturing Systems Engineering, Xi'an Jiaotong University.
- Sep. 2002-Jul. 2006 B.S. of Mechanical Engineering, Department of Mechanical Engineering, Xi'an Jiaotong University.

Papers

1. **Wei Cheng**, Zhousuo Zhang, Zhengjia He, et al. Quantitative calculation of vibration source contributions of shell structures using independent component analysis method. Chinese journal of Mechanical Engineering, 2010, 46(7): 82-87. (**EI source**, In Chinese)
2. **Wei Cheng**, Zhousuo Zhang, Zhengjia He, et al. Spectral correlation technique and its application to analyzing vibration signals' transfer characteristics of shell structures. Journal of Vibration and Shock, 2010, 29(7). (**EI source**, In Chinese)
3. Zhousuo Zhang, **Wei Cheng**, Xiaoning Zhou. Research on intelligent diagnosis of mechanical fault based on ant colony algorithm. In: the Sixth International Symposium on Neural Networks: 631-640 (ISNN2009). (**ISTP source**)
4. **Wei Cheng**, Zhousuo Zhang, Zhengjia He. A novel approach to quantitatively calculate the vibration source contributions of shell structures. Journal of Vibration and Acoustics, under review (**SCI source**).
5. **Wei Cheng**, Zhousuo Zhang, Zhengjia He. Feature extraction of mechanical signals based on denoising source separation. Journal of Sound and Vibration, under review. (**SCI source**).
6. **Wei Cheng**, Zhousuo Zhang, Zhengjia He. Enhance the separation performance of ICA via clustering evaluation and its applications. 2010 International Symposium on Mechanical Science and Technology, in press. (**SCI source**)
7. **Wei Cheng**, Zhousuo Zhang, Zhengjia He. Denoising source separation technique and its application to feature extraction of mechanical equipment running information. Chinese journal of Mechanical Engineering, 2010, 46(13). (**EI source**, In Chinese)
8. **Wei Cheng**, Zhousuo Zhang, Zhengjia He. Vibration analysis of shell structures based on an improved ICA approach. In: the Seventh International Symposium on Neural Networks (ISNN2010), in press. (**EI source**)

9. Xiaoxu Yan, Zhousuo Zhang, **Wei Cheng**. Intelligent Fault Diagnosis based on Granular Computing. In: 2008 IEEE International Conference on Granular Computing, 712-717. (**EI source**)
10. Zhousuo Zhang, Xiaoxu Yan, **Wei Cheng**. Intelligent Technique and its Application in Fault Diagnosis based on Granular Computing. International Journal of Granular Computing, Rough Sets and Intelligent Systems (IJGCRSIS), in press. (**EI source**)
11. Zhousuo Zhang, Xiaoxu Yan, **Wei Cheng**. Intelligent Technique and its Application in Fault Diagnosis of Locomotive Bearing based on Granular Computing. In: the Sixth International Symposium on Neural Networks (ISNN2009),3: 744-754, (**EI source**)
12. Zhousuo Zhang, Xiaoxu Yan, **Wei Cheng**. Granular Computing with Application to Fault Diagnosis. Journal of Xi'an Jiaotong University, 2009, 43(9): 37-41. (**EI source**)
13. Lve Chen, Yanyang Zi, Zhengjia He, **Wei Cheng**. Application of Ensemble Empirical Mode Decomposition Principle and 1.5 Dimension Spectrum Method. Journal of Xi'an Jiaotong University, 2009, 43(5): 94-98. (**EI source**)

Engineering Experience

- National research project
 - *National Natural Science Foundation of China* (No.50875197): explored Hybrid Intelligent Diagnosis method based on independent component analysis for mechanical damage detection.
 - *Key project of National Natural Science Foundation of China* (No. 50335030): delved into the incipient fault prognosis methods by Independent Component Analysis, particularly quantitatively calculating the vibration source contributions of thin shell structures.
 - *The Project Sponsored Scientific Research Foundation for the Returned Overseas Chinese Scholars, State Education Ministry*: intensively studied the mechanical health monitoring using Spectral Correlation Technique, Ant Colony Algorithm and Denoising Source Separation.
- Entrepreneurial research project (principal research person)
 - Vibration signal acquisition and fault diagnosis of a heavy-duty air compressor.
 - Noise source identification and active control over the vibration and noise of shell structures (Monitoring system design and software development).
 - Testing system design, vibration characteristics analysis and quantitative calculation of vibration source contributions of shell structures.
 - Vibration signal analysis and alarm system design of a pingpang table.

Awards and Honors

Oct. 2010	* Enterprise Scholarship of "SMTCL".	* Outstanding postgraduate
Oct. 2009	* First Scholarship of "National Graduate Innovation Fund".	
	* Enterprise Scholarship of "Guang Hua".	* Outstanding postgraduate
Oct. 2008	* Major Award for "National Graduate Innovation Fund".	