

汽车工程系

DEPARTMENT OF AUTOMOTIVE ENGINEERING

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危银涛 清华大学汽车工程系 教授

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教育背景

1994.9—1997.12 博士, 哈尔滨工业大学航天工程与力学系 复合材料专业

1988.9—1994.9 学士、硕士, 哈尔滨工业大学航天工程与力学系 计算力学专业

工作经历

2011.12—今 清华大学汽车工程系教授、博士生导师

2015.9—2015.12 德国德累斯顿工业大学, 洪堡访问学者

2009.8—2009.12 德国柏林勃兰登堡大学, 洪堡访问学者

2003.11—2004.3 德国亚琛工业大学、洪堡访问学者

2003.2—2003.10 德国汉诺威大学、洪堡访问学者

2002.2—2011.12 清华大学汽车工程系 副研究员

2000.1—2001.12 清华大学汽车工程系 博士后

1998.3—1999.12 华中科技大学力学系 博士后

学术兼职

《中国公路学报》 编委

《轮胎工业》 编委

社会兼职

中国橡胶专业委员会 副主任委员

中国石油和化工行业“绿色节能高性能轮胎材料行业重点实验室”学术委员会 委员



汽车工农业机械轮标委 (SAC/TC19/SC1)委员

Tire Society Member

北京力学会计算力学专业委员会 委员

湖南省“工程结构动力学与可靠性”重点实验室学术委员会 委员

研究领域

智能轮胎、车辆动力学与控制、振动噪声诊断与控制、复合材料与智能材料、橡胶本构与疲劳

研究概况

智能轮胎: 无源传感器系统、智能轮胎算法、胎路感知与六分力辨识、智能轮胎数据采集与大数据应用、下一代轮胎ITPMS系统;

车辆动力学与控制: 先进轮胎建模理论、先进车辆动力学建模与仿真技术(多体动力学、疲劳动力学、中高频车辆动力学行为)、磁流变半主动悬架动力学与控制、侧翻预警系统;

振动噪声诊断与控制: 流-固-声学耦合仿真技术、汽车胎噪-路噪分析与测试技术、车辆异常振动噪声诊断与控制技术、弹性减振器开发与应用;

复合材料与智能材料: MRF磁流变材料开发与应用、智能橡胶、阻尼可控悬架、刚度可控减振器、橡胶复合材料、车用CFRP;

橡胶本构与疲劳: 橡胶多轴本构测试系统、橡胶疲劳加速表征、橡胶裂纹扩展表征、生胶与硫化胶黏弹性理论、橡胶疲劳仿真软件。

主持国家自然科学基金机械学科和力学学科项目“子午线轮胎六分力预报理论”、“磁敏弹性体多轴大变形磁力耦合研究”、“填充橡胶Payne效应本构表征与微观机制”、“基于旋转模态理论子午线轮胎面内动力学研究”、“基于Kriging模型轮胎花纹形状优化设计新方法”等五项。

负责清华苏州汽车研究院重点产业化研发项目“基于无源传感器的智能轮胎研究”、中德TUD国际合作项目“智能轮胎集成仿真环境-SENSE”、“清华苏州汽车研究院智能轮胎研究所”、“清华玲珑汽车轮胎动力学联合中心”等;负责多个国际合作项目和产业化科技项目,主要研究智能轮胎系统、振动噪声控制、有限元方法、复合材料、轮胎力学与车辆动力学、电动汽车轮胎、橡胶疲劳等方面的研究。

奖励与荣誉

2003.2 德国洪堡学者

2016.9 国际轮胎协会特别提名奖(HONARABLE MENTION AWARD)

2016.2 黄河三角洲学者特聘专家

2008.4 浙江省科技进步二等奖

2014.12 湖北省科技进步二等奖

2005.8 中国流变学青年奖

2016.9 第19届全国轮胎技术研讨会一等奖(赛轮金宇杯)

学术成果

主持承担国际合作项目、国家基金项目 and 横向项目二十余项。在Vehicle System Dynamics, Journal of Sound and Vibration, Composite and structures等国际刊物发表论文40余篇。出版轮胎力学英文专著《Advanced mechanics of tire and rubber products》,主编《轮胎理论与技术》,近年来的代表性论著如下:

1. Wei Yintao, Michael Kaliske. ADVANCED MECHANICS OF TIRE AND RUBBER PRODUCTS. 北京:清华大学出版社, 2013.12.
2. Wei, Y.; Oertel, C.; Li, X.; Yu, L.: A theoretical model for the tread slip and the effective rolling radius of the tyres in free rolling. Proceedings of the Institution of Mechanical Engineers Part D Journal of Automobile Engineering (2017) DOI: 10.1177/0954407016675227.
3. Liu Zhe, Zhou Fuqiang, Christian Oertel, Wei Yintao, Three-dimensional vibration of a ring with a non-circular cross-section on an elastic foundation. Proceedings of the Institution of Mechanical Engineers Part C Journal of Mechanical Engineering Science (2017) DOI: 10.1177/0954406217720823.
4. Wei, Y.; Zhao, C.; Yao, Z.; Hauret, P.; Li, X.; Kaliske, M.: Adjoint design sensitivity analysis and optimization of nonlinear structures using geometrical mapping approach. Computers & Structures 183 (2017) 1-13.
5. Li, X.; Wei, Y.; Feng, Q.; Luo, R.K.: Mechanical behavior of nylon 66 tyre cord under monotonic and cyclic extension: Experiments and constitutive modeling. Fibers and Polymers 18 (2017) 542-548.

6. Feng, X.; Li, Z.; Wei, Y.; Chen, Y.; Kaliske, M.; Zopf, C.; Behnke, R.: A novel method for constitutive characterization of the mechanical properties of uncured rubber. *Journal of Elastomers and Plastics* 48 (2016) 523-534.
 7. Wei, Y.; Oertel, C.; Liu, Y.; Li, X.: A theoretical model of speed dependent steering torque for rolling tyres. *Vehicle system dynamics* 65 (2016) 463-473.
 8. Li, X.; Wei, Y.; He, Y.: Simulation on polytropic process of air springs. *Engineering Computation* 33 (2016) 1957-1968.
 9. Wei, Y.; Feng, Q.; Yang, Y.; Wang, H.; Li, X.; Kaliske, M.: A hybrid numerical-experimental analysis for tire air-pumping noise with application to pattern optimization. *Noise Control Engineering Journal* 64 (2016) 56-63.
 10. Li, X.; Wei, Y.: Classic strain energy functions and constitutive tests of rubber-like materials. *Rubber Chemistry and Technology* 88 (2015) 604-627.
 11. Wei, Y.; Oertel, C.; Shen, X.: Tyre rolling kinematics and prediction of tyre forces and moments: Part II – simulation and experiment. *Vehicle System Dynamics* 50 (2012) 1689-1706.
 12. Wei, Y.; Ali, R.; Yao, Z.; Wang, P.: A comparative analysis of contact algorithms in contact shape optimization problems. *Optimization and Engineering* 13 (2012) 595-623.
 13. Yintao Wei; Xijin Feng; Dabing Xiang: The simulation of the rolling noise based on Mixed Lagrange-Euler Method. *Tire Science and Technology*. 2016: 41(1):36-50.
 14. Wei, Y.T.; Nasdala, L.; Rothert, H.: Analysis of forced transient response for rotating tires using REF models, *Journal of Sound and Vibration*, 2009, 320(1-2):145-162.
 15. Guan YongJun; Wei YinTao: A new effective 3-D FE formulation of FRP structural modal damping for thick laminate, *Composite Structures*, 2009, 87(3):225-231.
- Y. T. Wei; L. Nasdala; H. Rothert; Z. Xie: Experimental investigations on the dynamic mechanical properties of aged rubbers, *Polymer Testing*, 2004, 23(4):447-453.

Resume of Prof. WEI Yintao

1. Experience

Dr. WEI Yintao, Professor of Department of Automotive Engineering, Tsinghua University, Beijing, China. Alexander von Humboldt Fellow. The main research area focuses on tire mechanics with application to tire/vehicle/rubber NVH, fatigue and simulation. He published 8 papers in the journal of "Tire Science and Technology", and 30+ papers on the journal of Vehicle System and Dynamics, Journal of Sound and Vibration, Composite and structures, Journal of Pressure Vessel Technology.

Dr. Wei published/edit two books:

Advanced mechanics of tire and rubber products, Tsinghua Press, 2012

The Pneumatic Tire, Translated from English Version, Tsinghua Press, 2012

Award:

Dr. Wei received the tire society HONARABLE MENTION AWARD 2016.

Education background:

1988-1992 Harbin Institute of Technology, Bachelor in Engineering Mechanics; 1994-1997 Harbin Institute of Technology, PhD in Composite Materials.

Experience:

2011.12-til now, Full Professor;

2003.2-2004.3 Alexander von Humboldt fellow visiting Scholar in University of Hannover, Aachen University of Technology in Germany.

2002.2-2011.12 Associate Professor in, Tsinghua University;

2. Projects, Patents and Software

1) Conducted 10+ projects on smart tires, tire noise simulation, testing, pattern design and materials improvements, with domestic and international industry partners such as Michelin, Chaoyang, Triangle, Linglong, Double Coin etc.

2) Awarded and Application of 10+ patents and softwares on tire noise, design and F&M prediction.

3. Selected publications

Books:

1. Wei Yintao, Michael Kaliske. ADVANCED MECHANICS OF TIRE AND RUBBER PRODUCTS. Beijing: Tsinghua University Press, 2013/12.
2. Wei Yintao, Li Yong, Tire Science and Technology (Translated from English Version, The Pneumatic Tires). Beijing: Tsinghua University Press, 2013.10

Articles:

1. Wei, Y.; Oertel, C.; Li, X.; Yu, L.: A theoretical model for the tread slip and the effective rolling radius of the tyres in free rolling. Proceedings of the Institution of Mechanical Engineers Part D Journal of Automobile Engineering (2017) DOI: 10.1177/0954407016675227.
2. Liu Zhe, Zhou Fuqiang, Christian Oertel, Wei Yintao, Three-dimensional vibration of a ring with a non-circular cross-section on an elastic foundation. Proceedings of the Institution of Mechanical Engineers Part C Journal of Mechanical Engineering Science (2017) DOI: 10.1177/0954406217720823.
3. Wei, Y.; Zhao, C.; Yao, Z.; Hauret, P.; Li, X.; Kaliske, M.: Adjoint design sensitivity analysis and optimization of nonlinear structures using geometrical mapping approach. Computers & Structures 183 (2017) 1-13.
4. Li, X.; Wei, Y.; Feng, Q.; Luo, R.K.: Mechanical behavior of nylon 66 tyre cord under monotonic and cyclic extension: Experiments and constitutive modeling. Fibers and Polymers 18 (2017) 542-548.
5. Feng, X.; Li, Z.; Wei, Y.; Chen, Y.; Kaliske, M.; Zopf, C.; Behnke, R.: A novel method for constitutive characterization of the mechanical properties of uncured rubber. Journal of Elastomers and Plastics 48 (2016) 523-534.
6. Wei, Y.; Oertel, C.; Liu, Y.; Li, X.: A theoretical model of speed dependent steering torque for rolling tyres. Vehicle system dynamics 65 (2016) 463-473.
7. Li, X.; Wei, Y.; He, Y.: Simulation on polytropic process of air springs. Engineering Computation 33 (2016) 1957-1968.
8. Wei, Y.; Feng, Q.; Yang, Y.; Wang, H.; Li, X.; Kaliske, M.: A hybrid numerical-experimental analysis for tire air-pumping noise with application to pattern optimization. Noise Control Engineering Journal 64 (2016) 56-63.
9. Li, X.; Wei, Y.: Classic strain energy functions and constitutive tests of rubber-like materials. Rubber Chemistry and Technology 88 (2015) 604-627.
10. Wei, Y.; Oertel, C.; Shen, X.: Tyre rolling kinematics and prediction of tyre forces and moments: Part II – simulation and experiment. Vehicle System Dynamics 50 (2012) 1689-1706.
11. Wei, Y.; Ali, R.; Yao, Z.; Wang, P.: A comparative analysis of contact algorithms in contact shape optimization problems. Optimization and Engineering 13 (2012) 595-623.
12. Yintao Wei; Xijin Feng; Dabing Xiang: The simulation of the rolling noise based on Mixed Lagrange-Euler Method. Tire Science and Technology. 2016: 41(1):36-50.
13. Wei, Y.T.; Nasdala, L.; Rothert, H.: Analysis of forced transient response for rotating tires using REF models, Journal of Sound and Vibration, 2009, 320(1-2):145-162.
14. Guan YongJun; Wei YinTao: A new effective 3-D FE formulation of FRP structural modal damping for thick laminate, Composite Structures, 2009, 87(3):225-231.
15. Y. T. Wei; L. Nasdala; H. Rothert; Z. Xie: Experimental investigations on the dynamic mechanical properties of aged rubbers, Polymer Testing, 2004, 23(4):447-453.

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