

GANG LI

Assistant Professor

Department of Mechanical Engineering, Mississippi State University

Office Phone: +1 (662)-325-3260; Email: gli@me.msstate.edu

EDUCATION

University of Maryland Baltimore County Visiting Ph.D., Department of Mechanical Engineering	<i>Oct 2016 - May 2017</i>
University of Shanghai for Science and Technology Ph.D., in Mechanical Engineering	<i>Sept 2013 - Jun 2017</i>
University of Shanghai for Science and Technology M. S., in Mechanical Engineering	<i>Sept 2010 - Jun 2013</i>
University of Shanghai for Science and Technology B. S., in Mechanical Engineering	<i>Sept 2006 - Jun 2010</i>

EXPERIENCE

Assistant Professor , Mississippi State University Mississippi State, MS	<i>Aug 2023 - Present</i>
Assistant Research Professor , University of Maryland, Baltimore County Baltimore, MD	<i>Oct 2022 - June 2023</i>
Patent Agent (part-time), Bayes PLLC Tysons Corner, VA	<i>Spet 2022 - July 2023</i>
Postdoc Research Associate , University of Maryland, Baltimore County Baltimore, MD	<i>Jul 2017 - Oct 2022</i>
Research Associate , University of Maryland Baltimore County Baltimore, MD	<i>Oct 2016 - May 2017</i>
Research Assistant , University of Shanghai for Science and Technology Shanghai, China	<i>Oct 2011 - Aug 2016</i>
CAE Engineer (part-time), China Shipbuilding Industry Co., Ltd. Shanghai, China	<i>Mar 2014 - Dec 2014</i>
CAE Intern , Shanghai Machine Tool Works Ltd. Shanghai, China	<i>Mar 2013 - Sept 2013</i>

PROJECTS

PFI-TT: A New Cost-Effective and Scalable Infinitely Variable Transmission for Tidal Current Energy Harvesting (Co-PI) Mississippi State University Supported by <i>National Science Foundation (NSF)</i> , Grant No. 2329791	<i>Sept 2023 - Present</i>
--	----------------------------

“ScanMaster” – Mirror-Assisted Continuously Scanning Laser Vibrometry for Measuring Three-Dimensional Panoramic Vibrations of Structures

University of Maryland Baltimore County

Sept 2022 - Mar 2023

Supported by *TEDCO - Maryland Innovation Initiative (MII)*

Collaborative Research: Three-dimensional Continuous Scanning Laser Vibrometry with Application to Structural Damage Detection

University of Maryland Baltimore County

Jan 2022 - Aug 2022

Supported by *National Science Foundation (NSF), Grant No. CMMI-1763024*

Novel Tracking Continuous Scanning Laser Doppler Vibrometry for Wind Turbine Blade Vibration Monitoring and Damage Detection

University of Maryland Baltimore County

Oct 2021 - Jan 2022

Supported by *UMBC - Technology Catalyst Fund (TCF)*

A Novel Geared Infinitely Variable Transmission for Tidal Current Energy Harvesting

University of Maryland Baltimore County

Apr 2019 - Sept 2021

Supported by *Maryland Energy Innovation Institute (MEI²), Energy Innovation Seed Grant*

“Transfinity” – an Infinitely-variable Transmission for Tidal Energy Harvesting

University of Maryland Baltimore County

Sept 2020 - July 2021

Supported by *TEDCO - Maryland Innovation Initiative (MII)*

Novel Infinitely Variable Transmission for Tidal Current Energy Harvesting

University of Maryland Baltimore County

Mar 2020 - Dec 2020

Supported by *UMBC - Technology Catalyst Fund (TCF)*

“Windmaster” – an Improved Hybrid Vertical Axis Wind Turbine

University of Maryland Baltimore County

Sept 2019 - July 2020

Supported by *TEDCO - Maryland Innovation Initiative (MII)*

Novel Drivetrains for Wind Turbines with Geared Infinitely-Variable Speed Converters and Variable Electromotive-Force Generators

University of Maryland Baltimore County

Oct 2016 - Oct 2018

Supported by *National Science Foundation (NSF), Grant No. CMMI-1335397*

Design and CAM Software Development of a Form-Grinding Machine Tool for Involute Cylindrical Gears

University of Shanghai for Science and Technology

Jan 2012- Aug 2016

Supported by *Hunan Jinnengda Mechanical and Electric Technology Co., Ltd.*

Study of Vibration Performance for Spiral Bevel Gears based on a Real Tooth Surface Model

University of Shanghai for Science and Technology

Jan 2011 - Dec 2013

Supported by *National Science Foundation of China (NSFC)*, Grant No. 51075279

Study of Vibration Reduction and Optimization Design for Spiral Bevel Gears

University of Shanghai for Science and Technology

Sept 2010 - Dec 2013

Supported by *Shanghai Education Commission, Science and Technology Innovation Projects*, Grant No. 10CZZ92

Development of Parametrization Design and Simulation System for Machine Tools

University of Shanghai for Science and Technology

Jan 2011 - Dec 2012

Supported by *Shanghai Education Commission, Science and Technology Innovation Projects*, Grant No. 11CXY45

Development of a Computer-Aid Design System for Hydro-Cylinder Products

University of Shanghai for Science and Technology

Feb 2011 - Sept 2013

Supported by *Xuzhou Xugong Hydraulic Parts Co., Ltd.*

TEACHING EXPERIENCES & MENTORSHIP

Teaching Experiences

System Dynamics (ME3613)

Mississippi State University

Fall 2023

Undergraduate Course

Engineering Mechanics - Dynamics (ENME221)

University of Maryland Baltimore County

Teaching Assistant; Fall 2018

Undergraduate Course

Linear Vibrations (ENME662)

University of Maryland Baltimore County

Teaching Assistant; Fall 2019

Graduate Course

Dynamics (ENME664)

University of Maryland Baltimore County

Teaching Assistant; Spring 2018, Spring 2019

Graduate Course

Mentorship (Served as co-supervisor for two M.S. students.)

Alexander Ives, M.S. student

May 2023

University of Maryland Baltimore County; Supervisor: *Prof. Weidong Zhu*

Thesis Title: Power loss analysis of an infinitely variable transmission for tidal current energy harvesting

Ruixu Zhang, M.S. student

May 2018

University of Maryland Baltimore County; Supervisor: *Prof. Weidong Zhu*

Thesis Title: Design and efficiency evaluation of a noncircular gear pair for an infinitely variable transmission

PUBLICATIONS

Journal Papers

1. **Gang Li** and Weidong Zhu. Control and flume flow experiments of a tidal current energy converter with an infinitely variable transmission. *Renewable Energy*, 2023, Under Review.
2. **Gang Li** and Weidong Zhu. Tidal current energy harvesting technologies: A review of current status and resource and life cycle assessments. *Renewable and Sustainable Energy Reviews*, 179:113269, 2023.
3. **Gang Li** and Weidong Zhu. A review on up-to-date gearbox technologies and maintenance of tidal current energy converters. *Energies*, 15:9236, 2022.
4. **Gang Li** and Weidong Zhu. Time-delay closed-loop control of an infinitely variable transmission system for tidal current energy converters. *Renewable Energy*, 189:1120–1132, 2022.
5. Xiaoli Zhang, Ji Yang, Weidong Zhu, and **Gang Li**. A non-destructive health monitoring method for wooden utility poles with frequency-modulated empirical mode decomposition and Laplace wavelet correlation filtering. *Sensors*, 22(11):4007, 2022.
6. Zhi Geng and **Gang Li**. A reliability-enhanced forming grinding method of cylindrical involute gears for electrical vehicles. *International Journal of Automotive Science and Technology*, 6(4):317–323, 2022.
7. Zhi Geng and **Gang Li**. Optimal clutch control of a one-way clutch assistant transmission for electrical vehicles. *International Journal of Automotive Science and Technology*, 6(3):257–264, 2022.
8. **Gang Li** and Weidong Zhu. Experimental investigation on control of an infinitely variable transmission system for tidal current energy converters. *IEEE/ASME Transactions on Mechatronics*, 26(4):1960–1967, 2021.
9. **Gang Li**, Xuefeng Wang, and Weidong Zhu. Theoretical and experimental investigation on an integral time-delay feedback control combined with a closed-loop control for an infinitely variable transmission system. *Mechanism and Machine Theory*, 164:104410, 2021.
10. **Gang Li** and Weidong Zhu. Design and power loss evaluation of a noncircular gear pair for an infinitely variable transmission. *Mechanism and Machine Theory*, 156:104137, 2021.
11. **Gang Li** and Zhi Geng. Gear bending stress analysis of automatic transmissions with different fillet curves. *International Journal of Automotive Science and Technology*, 5(2):100–106, 2021.
12. **Gang Li** and Zhi Geng. Tooth contact analysis of herringbone rack gears of an impulse continuously variable transmission. *International Journal of Automotive Science and Technology*, 5(1):52–57, 2021.
13. Minhui Tong, Weidong Zhu, Xiang Zhao, Meilin Yu, Kan Liu, and **Gang Li**. Free and forced vibration analysis of H-type and hybrid vertical-axis wind turbines. *Energies*, 13(24):6747, 2020.
14. **Gang Li**. Design and modeling of an impulse continuously variable transmission with a rotational swashplate. *International Journal of Automotive Science and Technology*, 4(4):307–313, 2020.
15. John Yan, **Gang Li**, and Kan Liu. Development trend of wind power technology. *International Journal of Advanced Engineering Research and Science*, 7(6):124–132, 2020.
16. Yuhao Hu, **Gang Li**, Weidong Zhu, and Jiankun Cui. An elastic transmission error compensation method for rotary vector speed reducers based on error sensitivity analysis. *Applied Sciences*, 10(2):481, 2020.

17. **Gang Li** and Weidong Zhu. An active ease-off topography modification approach for hypoid pinions based on a modified error sensitivity analysis method. *ASME Journal of Mechanical Design*, 141(9):093302, 2019.
18. **Gang Li**, Zhonghou Wang, and Weidong Zhu. Prediction of surface wear of involute gears based on a modified fractal method. *ASME Journal of Tribology*, 141(3):031603, 2019.
19. **Gang Li**. An active forming grinding method for cylindrical involute gears based on a second-order transmission error model. *SCIREA Journal of Mechanical Engineering*, 2(1):1–14, 2019.
20. Dequan Huang, Zhonghou Wang, **Gang Li**, and Weidong Zhu. Conjugate approach for hypoid gears frictional loss comparison between different roughness patterns under mixed elasto-hydrodynamic lubrication regime. *Tribology International*, 140:105884, 2019.
21. **Gang Li**, Zhonghou Wang, Weidong Zhu, and Aizoh Kubo. A function-oriented active form-grinding method for cylindrical gears based on error sensitivity. *The International Journal of Advanced Manufacturing Technology*, 92(5-8):3019–3031, 2017.
22. **Gang Li**, Zhonghou Wang, and Aizoh Kubo. Error-sensitivity analysis for hypoid gears using a real tooth surface contact model. *Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science*, 231(3):507–521, 2017.
23. **Gang Li**, Zhonghou Wang, and Aizoh Kubo. The modeling approach of digital real tooth surfaces of hypoid gears based on non-geometric-feature segmentation and interpolation algorithm. *International Journal of Precision Engineering and Manufacturing*, 17(3):281–292, 2016.
24. Wenxue Zhang, Zhonghou Wang, Xinrong Liu, **Gang Li**, and Pinlei Wan. Research on optimization of temperature measuring point and thermal error prediction method of cnc machine tools. *Journal of Shaanxi University of Technology*, 33(3):18–24, 2017. (in Chinese)
25. Kunlong Gu, Zhonghou Wang, **Gang Li**, and Xinrong Liu. Optimization of geometric parameters of a straight conjugate internal gear pump based on a genetic algorithm. *Journal of Electronic Science and Technology*, 30(6):39–42, 2017. (in Chinese)
26. Zhonghou Wang, Huan Cao, **Gang Li**, and Xinrong Liu. Compensation of the radial error of measuring head based on form grinding machine. *Journal of Mechanical Transmission*, 41(3):143–146, 2017. (in Chinese)
27. Zhonghou Wang, Keke Yuan, and **Gang Li**. Optimization identification for dynamic characteristic parameters of sliding joints based on response surface methodology. *China Mechanical Engineering*, 27(5):622–626, 2016. (in Chinese)
28. **Gang Li**, Zhonghou Wang, Zhi Geng, and Wenmin Zhu. The modeling approach of digital real tooth surfaces of hypoid gears based on non-geometric-feature segmentation and interpolation algorithm. *Chinese Journal of Mechanical Engineering*, 51(7):77–84, 2015. (in Chinese)
29. Zhonghou Wang, Xiaoming Song, Weiming He, and **Gang Li**. Tooth surface model construction and error evaluation for tooth-trace modification of helical gear by form grinding. *China Mechanical Engineering*, 26(21):1665–1671, 2015. (in Chinese)
30. Zhonghou Wang, Zhi Geng, **Gang Li**, and Wenmin Zhu. Compensation for tooth profile deviation of form-grinding tooth with grinding wheel dressing. *Journal of Mechanical Transmission*, 39(1):13–16, 42–43, 2015. (in Chinese)

31. Jinliang Wu, Zhonghou Wang, and **Gang Li**. Study on the crack propagation characteristic and remaining life of helical gears. *Journal of Mechanical Transmission*, 38(12):1–4, 2015. (in Chinese)
32. **Gang Li**, Zhonghou Wang, and Aizoh Kubo. Tooth contact analysis of spiral bevel gears based on digital real tooth surfaces. *Chinese Journal of Mechanical Engineering*, 50(15):1–11, 2014. (in Chinese)
33. Zhonghou Wang, Wenmin Zhu, **Gang Li**, and Zhi Geng. Optimization of contact lines for form-grinding modified helical gears based on neural network. *China Mechanical Engineering*, 25(12):1665–1671, 2014. (in Chinese)
34. Xiaoling Zhou, **Gang Li**, Zhonghou Wang, and Wenmin Zhu. Feedback robust optimization design method of involute gears. *Journal of Mechanical Transmission*, 38(9):5–10, 2014. (in Chinese)
35. Fajun Zhang, Xiaoling Zhou, Jie Wang, **Gang Li**, and Xinrong Liu. Influence of installation error of high precision modeling of helical gears on contact stress area and tooth root bending stress. *Journal of Mechanical Transmission*, 38(8):6–9, 2014. (in Chinese)
36. Zhonghou Wang, Jie Wang, Qiaoling Wang, and **Gang Li**. Transmission error analysis of spiral bevel gear based on finite element method. *Journal of Vibration and Shock*, 33(14):165–170, 2014. (in Chinese)
37. Zhonghou Wang, Jie Wang, Pengcheng Ma, and **Gang Li**. Dynamic transmission error analysis of spiral bevel gears with actual tooth surfaces. *Journal of Vibration and Shock*, 33(15):138–143, 2014. (in Chinese)
38. Zhonghou Wang, Jinni Ma, Xiaojun Kang, and **Gang Li**. Involute gear contact pattern analysis and simulation based on numbs surfaces. *Journal of Mechanical Transmission*, 38(1):44–49, 2014. (in Chinese)
39. Zhonghou Wang, **Gang Li**, Xinglin Zhang, and Kesong Li. Study on virtual hobbing simulation and tooth surface accuracy of involute helical gears. *Journal of Mechanical Transmission*, 36(8):9–13, 2012. (in Chinese)

Conference Papers

1. **Gang Li** and Weidong Zhu. Experimental investigation on control of an infinitely variable transmission system for tidal current energy converters. In *IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM2021)*, Delft, The Netherlands, July 2021.
2. Yuhao Hu, **Gang Li**, and Aimin Hu. Iterative optimization of orbital dynamics based on model prediction. In *Fuzzy Systems and Data Mining V: Proceedings of FSDM 2019*, volume 320, pages 76–86, Osaka, Japan, March 2019.
3. Zhonghou Wang, **Gang Li**, Xinrong Liu, and Liming Zhang. A function-oriented active forming grinding method of cylindrical involute gears. In *Power Transmissions: Proceedings of the International Conference on Power Transmissions 2016 (ICPT 2016)*, page 217, Chongqing, China, October 2016.
4. **Gang Li**, Zhonghou Wang, Liping Zhang, and Qingjiao Liu. Development of an intelligent design system for hydro-cylinders. In *Chinese Doctoral Forum in Mechanical Engineering*, Suzhou, China, September 2014.

5. Zhonghou Wang, **Gang Li**, and Jie Wang. Transmission error analysis of spiral bevel gears considering material damping. In *Chinese Society of Aeronautics and Astronautics Power Transmission Conference*, Yueyang, China, November 2013.
6. Zhonghou Wang, **Gang Li**, and Aizoh Kubo. Tooth contact analysis of spiral bevel gears based on digital real tooth surfaces. In *Chinese Society of Aeronautics and Astronautics Power Transmission Conference*, Yueyang, China, November 2013.
7. Xinglin Zhang, Zhonghou Wang, and **Gang Li**. Research on virtual hobbing simulation and study of tooth surface accuracy of involute helical gears. In *Applied Mechanics and Materials*, volume 155, pages 601–605. Trans Tech Publ, 2012.

PATENTS & COPYRIGHT

Patents

1. Weidong Zhu and **Gang Li**. Noncircular gear pair. U.S. Patent Application No. 18/048,563, Published, April 2023.
2. Weidong Zhu, **Gang Li**, Meilin Yu, and Xuefeng Wang. Time-delay closed-loop control of an infinitely variable transmission system for tidal current energy converters. U.S. Patent Application No.: US17/723,805, Published, August 2022.
3. Weidong Zhu, Xuefeng Wang, and **Gang Li**. Closed-loop control of an infinitely variable transmission. U.S. Patent, Patent No.: US11,686,388 B2, Issued, June 2023.
4. Weidong Zhu, Xuefeng Wang, and **Gang Li**. Closed-loop control of an infinitely variable transmission. U.S. Patent, Patent No.: US 11,268,615 B2, Issued, March 2022.
5. Zhonghou Wang, **Gang Li**, Zhang Liming, Yahe Ma, Wenmin Zhu, Zhi Geng, and Xinrong Liu. A form-grinding wheels design method for involute gears. China Patent, Patent No.: CN105223814B, Issued, March 2018.
6. Zhonghou Wang, Wenmin Zhu, **Gang Li**, Xiaoling Zhou, Zhi Geng, Keke Yuan, and Xinrong Liu. A form-grinding wheel dresser. China Patent, Patent No.: CN104669116B, Issued, March 2017.
7. Zhonghou Wang, Xinrong Liu, Xiaoling Zhou, Shaokun Liu, **Gang Li**, Huan Cao, Yahe Ma, , and Kai Hu. A fixture for spur gears with involute splined holes. China Patent, Patent No.: CN104842020B, Issued, April 2017.
8. Zhonghou Wang, Pinlei Wan, Yahe Ma, Linxi Zeng, Xinrong Liu, and **Gang Li**. A temperature field simulation method for rubbers with cords. China Patent, Patent No.: CN104794277B, Issued, September 2017.

Copyright

“A rapid design system for hydro-cylinders v1.0,” Software Copyright No. 2013SR073353, China, July 2013.

OUTREACH ACTIVITIES & MEMBERSHIP

Outreach Activities

Future Engineers in Dynamic Systems (FEDS) Academy
University of Maryland Baltimore County

Supervised by *Prof. Weidong Zhu*

Served as a mentor in a two-week summer educational program, called the Future Engineers in Dynamic Systems (FEDS) Academy, for underserved high school students in the Baltimore area; over 40% of which are underrepresented students. Demonstrated modal testing of baseball bats, acoustic guitars, bamboo bridges, and scale masts.

Membership

- American Society of Mechanical Engineers (ASME)
- Society of Automotive Engineers (SAE International)
- Chinese Gear Manufacturers Association (CGMA)

SERVICE TO THE PROFESSION

Editorial Board

- Frontiers in Energy Research
- Engineering Perspective
- Journal of Dynamics and Control
- SCIREA Journal of Mechanical Engineering
- SCIREA Journal of Energy

Committee Member

- The 5th International Conference on Materials, Mechanical Engineering and Automation Technology (MMEAT 2019), Wuhan, China, March 2019

Reviewer

- **Journals**

IEEE/ASME Transaction Mechatronics; Nonlinear Dynamics; Applied Sciences; Energies; Machines; Sensors; Fractal and Fractional; Journal of Computational Design and Engineering; Advances in Mechanical Engineering; Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science; Computer Modeling in Engineering & Sciences; Mathematical Problems in Engineering; Engineering Report; International Journal of Mechanical Engineering and Applications; Engineering Technology Open Access Journal; The Open Mechanical Engineering Journal; Chinese Journal of Mechanical Engineering; Journal of Dynamics and Control; Journal of Mechanical Transmission; Journal of Aerospace Power; Journal of Vibration and Shock; Journal of Harbin Institute of Technology

- **Conferences**

ASME International Mechanical Engineering Congress & Exposition (IMECE 2023), New Orleans, LA, USA, November 2023

ASME International Mechanical Engineering Congress & Exposition (IMECE 2022), Columbus, OH, USA, November 2022

ASME International Mechanical Engineering Congress & Exposition (IMECE 2021), online, November 2021

ASME International Mechanical Engineering Congress & Exposition (IMECE 2020), Portland, USA, November 2020

ASME International Mechanical Engineering Congress & Exposition (IMECE 2019), Salt Lake City, USA, November 2019
The 8th Global Conference on Martials Science and Engineering (CMSE 2019), Kitakyushu, Japan, August 2019
ASME International Mechanical Engineering Congress & Exposition (IMECE 2018), Pittsburgh, USA, November 2018
International Conference on Mechanical, Electric and Industrial Engineering (ICMEIE 2018), Hangzhou, China, May 2018

HONORS & AWARDS

2022 Best Paper on Mechatronics , ASME DSCD Mechatronics Technical Committee	<i>Oct 2022</i>
Best Performance Award , NSF I-Corps program	<i>Jun 2020</i>
Top 10 Best Students Award , University of Shanghai for Science and Technology	<i>Jun 2016</i>
National Scholarship , Ministry of Education of China	<i>Dec 2015</i>
National Scholarship , Ministry of Education of China	<i>Dec 2014</i>
Excellent Student Award , University of Shanghai for Science and Technology	<i>Dec 2014</i>
Third Place Award , 6th International Conference of Chinese Society of Mechanical Engineering on Mechanical Power Transmission	<i>Sept 2014</i>
Best Paper Award , 16th Committee Conference of Chinese Society of Aeronautics and Astronautics on Mechanical Power Transmission	<i>Nov 2013</i>