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# GANG LI

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## RESEARCH INTERESTS

- Computational solid mechanics at nano, micro, meso and macro scales
- Computational modeling and simulation of micro/nanoscale thermal transport, electrical transport, energy conversion and other multi-physics phenomena in crystalline and composite materials
- Multiscale computational methods
- Computational design, analysis and optimization of meta-materials
- Energy harvesting

## EDUCATION

- Ph.D., University of Illinois at Urbana-Champaign, 2003, Mechanical Engineering
- M.A.Sc, Dalhousie University, Canada, 1999, Mechanical Engineering
- M.Eng., Tongji University, China, 1996, Mechanical Engineering
- B.S., Tongji University, China, 1993, Automotive Engineering

## PROFESSIONAL EXPERIENCE

- Clemson University, 2018-present, Professor of Mechanical Engineering
- Clemson University, 2012-2018, Associate Professor of Mechanical Engineering
- Clemson University, 2006-2012, Assistant Professor of Mechanical Engineering
- University of Illinois at Urbana-Champaign, 2004-2006, Research Scientist
- University of Illinois at Urbana-Champaign, 2003-2004, Postdoctoral Fellow
- Shanghai Volkswagen Co., 1996, Engineer

### Adjunct Professor Positions

- Zhejiang University Ningbo Institute of Technology, Institute of Energy and Environment Engineering, 2017-present

## MEMBERSHIPS

- Member, United States Association of Computational Mechanics (2009- )
- Member, American Society of Mechanical Engineers, ASME (1999- )

- Member, Sigma Xi (2009 - )

## **PROFESSIONAL ACTIVITIES**

- Editorial Positions
  - (1) Associate Editor, Journal of Computational Electronics (2017 – present)
  - (2) Editorial Board Member, International Journal of Nanoparticles and Nanotechnology (2016-present)
- ASME Committee on Computing in Applied Mechanics, Member, Applied Mechanics Division (2007 - present)
- Gordon Research Conference, Elected Vice Chair and Chair, Nano-Mechanical Interfaces, Hong Kong, China, (July 2017, July 2019)
- Gordon Research Conference, Discussion Leader, Nano-Mechanical Interfaces, Hong Kong, China, (July 2013, 2015)
- ASME, Symposium Organizer, Modeling of the Fracture, Failure and Fatigue in Solids, IMECE, (November 2017, 2018)
- ASME, Symposium Organizer, Multi-Physics Simulations and Experiments for Solids, IMECE, (November 2012, 2013, 2014, 2015, 2018)
- ASME, Symposium Organizer, Multi-Physics Simulations for Solids, IMECE, (November 2009, 2010, 2011)
- ASME, Symposium Organizer, Computational Analysis of Nanostructured Thermoelectric Materials, IMECE 2008 (November 2008)
- ASME, Symposium Organizer, Multi-Scale Multi-Physics Modeling and Simulation of Nanomaterials and Nanostructures, IMECE 2007 (November 2007)
- U.S. Association for Computational Mechanics, Symposium Organizer, the 9<sup>th</sup> USNCCM, (July 2007)
- ASME, Symposium Organizer, McMat 2007 (June 2007)
- Technical Program Committees
  - (1) International Conference on Intelligent Cloud Computing (ICC2016), Wuhan, China (December 2016)
  - (2) International Symposium on Intelligent Unmanned Systems and Artificial Intelligence (SIUSAI2017), Osaka, Japan (September 2017)
- Grant Proposal Reviewer
  - (1) NSF (2010, 2012, 2013, 2016, 2017)
  - (2) SC EPSCoR/IDeA (2014)
  - (3) ACS Petroleum Research Fund (2014)
- Reviewer for Books
  - (1) Finite Element Modeling and Simulation with ANSYS Workbench (2014)
  - (2) Finite Element Basic Concepts for Engineers, with ANSYS Application (2016)
  - (3) Numerical Analysis for Science, Engineering and Technology (2017)
- Reviewer for Journals
  - (1) Applied Physics A
  - (2) Applied Physics Letters
  - (3) Computational Mechanics

- (4) Computer Methods in Applied Mechanics and Engineering
- (5) Computers and Structures
- (6) IEEE/ASME Journal of Microelectromechanical Systems
- (7) IEEE Transactions on Circuits and Systems II
- (8) IEEE Transactions on Electron Devices
- (9) International Journal for Numerical Methods in Engineering
- (10) International Journal of Thermophysics
- (11) Journal of Applied Mechanics
- (12) Journal of Applied Physics
- (13) Journal of Computational Electronics
- (14) Journal of Heat Transfer
- (15) Journal of the Mechanics and Physics of Solids
- (16) Journal of Micromechanics and Microengineering
- (17) Journal of Micro/Nanolithography, MEMS and MOEMS
- (18) Journal of Physics D: Applied Physics
- (19) Materials and Design
- (20) Materials Research Express
- (21) Materials Science and Engineering B
- (22) Mechatronics
- (23) Microelectronic Engineering
- (24) Nanoscale
- (25) Proceedings of the Royal Society A
- (26) Sensors
- (27) Sensors and Actuators

## **HONORS AND AWARDS**

- Elected Chair and Vice Chair, Gordon Research Conference, Nano-Mechanical Interfaces, Hong Kong, China (2019, 2017)
- D. W. Reynolds Emerging Faculty Scholar Award, Clemson University (2016)
- Eastman Chemical Award, Clemson University (2015)
- Board of Trustee Award, Clemson University (2011)
- CAREER Award, NSF (2010)
- Finalist, the 16th Annual Robert J. Melosh Medal Competition for the best student paper on Finite Element Analysis (2004)
- Travel Award, U.S. National Congress on Computational Mechanics (2001)
- Dalhousie Graduate Fellowship (1998)
- Tongji Guang Hua Fellowship (1994)
- Shanghai Outstanding Graduate Award (1993)

## **PUBLICATIONS**

### **Books**

1. Li, G., "Introduction to the Finite Element Method and Implementation with MATLAB," Cambridge University Press, expected 2019.

## **Book Chapters**

1. Xu, Y. and Li, G., "Modeling and Analysis of Strain Effects on Thermoelectric Figure of Merit in Si/Ge Nanocomposites," *Nanoscale Thermoelectrics*, ed. by Z. Wang, Springer, 2013.
2. Li, G., Jin, X., and Aluru, N.R., "Meshless methods for numerical solution of partial differential equations," *Handbook of Materials Modeling*, ed. by S. Yip, Vol. I, Kluwer, 2005.

## **Refereed Journal Papers**

1. Liu, Q., Daqaq, M. F., and Li, G., "Magnetization and Microstructures of Ferrofluid under Shear Flow: A Non-Equilibrium Molecular Dynamics Study," Submitted for publication, (2018).
2. Gong, J., Thompson, L. and Li, G., "On the Local and Non-local Plate Models of Single Layer Graphene," Submitted for publication, (2018).
3. Kulkarni, N., Franklin, S. J., Fadel, G., Li, G., Coutris, N. and Castanier, M., "Extended Unit Cell Synthesis Method and Design Sensitivity Analysis of Tank Track Pad Meta-Material," Submitted for publication, (2018).
4. Noel, J., Yadav, R., Li, G., and Daqaq, M. F., "Improving the Performance of Galloping Micro-Power Generators by Passively Manipulating the Trailing Edge," *Applied Physics Letters*, **112**(8), 083503 (2018).
5. Liu, Q., Daqaq, M. F., and Li, G., "Performance Analysis of a Ferrofluid-Based Electromagnetic Energy Harvester," *IEEE Transactions on Magnetics*, **54**(5), 4600314 (2018).
6. Li, W., Chen, J., Zhao, H., and Li, G., "Heat Flux Induced Coherent Vibration of H-Shaped Single Layer Graphene Structure," *Nanoscale*, **10**, pp. 1432-1439, (2018).
7. Liu, Q., Alazemi, S. F., Daqaq, M. F., and Li, G., "A Ferrofluid Based Energy Harvester: Computational Modeling, Analysis, and Experimental Validation," *Journal of Magnetism and Magnetic Materials*, **449**, 105-118 (2017).
8. Satterfield, Z., Kulkarni, N., Fadel, G., Li, G., Coutris, N. and Castanier, M., "Unit Cell Synthesis Method to Design Meta-Materials with Targeted Nonlinear Deformation Response," *Journal of Mechanical Design*, **139** (12), 121401, (2017).
9. Ozsoy, I. B., Choi, H., Joseph, P., Li, G., Luzinov, I. and Zhao, H., "Reinforced Thermoplastic Composites with Interfacial Microarchitectural Anchoring: Computational Study," *International Journal of Solids and Structures*, **112**, 54-64 (2017).
10. Yu, Y., Zhao, H. and Li, G., "A Quasi-Continuum Thermomechanical Model for Phonon Damping Analysis of Single-Crystal Silicon Nano-Resonators," *International Journal of Heat and Mass Transfer*, **106**, 491-502 (2017).  
In March 2017, the paper was highlighted by Advances in Engineering (<https://advanceseng.com>) as a key scientific article contributing to science and engineering research excellence.
11. Gong, J., Thompson, L. and Li, G., "A Semi-Analytical Approach for Calculating the Equilibrium Structure and Radial Breathing Mode Frequency of Single-Walled Carbon Nanotubes," *Acta Mechanica Sinica*, **32**(6), 1075-1087 (2016)

12. Li, C., Li, G. and Zhao, H., "Thermal Conductivity Variation of Graphene with Patterned Double-Side Hydrogen Doping," *Journal of Applied Physics*, **118**, 075102 (2015).
13. Ozsoy, I. B., Li, G., Choi, H. and Zhao, H., "Shape Effects on Nanoparticle Engulfment for Metal Matrix Nanocomposites," *Journal of Crystal Growth*, **422**, 62-68 (2015).
14. Li, H. and Li, G., "Analysis of Ballistic Transport in Nanoscale Devices by Using an Accelerated Finite Element Contact Block Reduction Approach," *Journal of Applied Physics*, **116**, 084501 (2014).
15. Li, H., Yu, Y. and Li, G., "Computational Modeling and Analysis of Thermoelectric Properties of Nanoporous Silicon," *Journal of Applied Physics*, **115**, 124316 (2014).
16. Li, C., Li, G. and Zhao, H., "Hydrogenation Induced Deformation Mode and Thermal Conductivity Variations in Graphene Sheets," *Carbon*, **72**, 185-191 (2014).
17. Li, H., Xu, Y., Xu, Y. and Li, G., "Strain Effect Analysis on the Electrical Conductivity of Si/Si(1-x)Ge(x) Nanocomposite Thin Films," *Solid State Electronics*, **85**, 64-73 (2013).
18. Xu, Y. and Li, G., "Strain Effect Analysis on the Thermoelectric Figure of Merit in n-type Si/Ge Nanocomposites," *Journal of Applied Physics*, **111**, 054318 (2012).
19. Lan, J. and Li, G., "A Component Mode Synthesis Approach for Multiscale Dynamic Analysis of Nanostructures," *International Journal for Numerical Methods in Engineering*, **92**(1), 79-98 (2012).
20. Bibo, A., King, A., Masana, R., Li, G. and Daqaq, M. F., "Electromagnetic Ferrofluid-based Energy Harvester," *Physics Letters A*, **376**(32), 2163-2166 (2012).
21. Xu, Y. and Li, G., "Thermal Actuation using Nanocomposites: A Computational Analysis," *Journal of Heat Transfer*, **134**, 112401 (2012).
22. Bibo, A., Li, G. and Daqaq, M. F., "Performance Analysis of a Harmonica Type Aeroelastic Micropower Generator," *Journal of Intelligent Material Systems and Structures*, **23**(13), 1461-1474 (2012).
23. Chakravarthy, P. and Li, G., "On Particle Impact Induced Bong Breaking of Single-Walled Carbon Nanotubes," *World Journal of Engineering*, ICCE-19 special issue, supplement 1 (2011).
24. Li, H. and Li, G., "Component Mode Synthesis Approaches for Quantum Mechanical Electrostatic Analysis of Nanoscale Devices," *Journal of Computational Electronics*, **10**(3), 300-313 (2011).
25. Bibo, A., Li, G. and Daqaq, M. F., "Electromechanical Modeling and Normal Form Analysis of an Aeroelastic Micro-Power Generator", *Journal of Intelligent Material Systems and Structures*, **22**(6), 577-592 (2011).
26. St. Clair, D., Bibo, A., Sennakesavababu, V. R., Daqaq, M. F. and Li, G., "A Scalable Concept for Micro-Power Generation Using Flow-Induced Self-Excited Oscillations," *Applied Physics Letters*, **96**, art. no. 144103 (2010).
27. Xu, Y. and Li, G., "Strain Effect Analysis on Phonon Thermal Conductivity of 2-D Nanocomposites," *Journal of Applied Physics*, **106**, art. no. 114302 (2009).

28. Starling, T., Daqaq, M. and Li, G., "A Computational Approach for Pre-Shaping Voltage Commands of Torsional Micromirrors," *Computer Modeling in Engineering and Sciences*, **45**(3), 207-225 (2009).
29. Wang, W., Li, G. and Huang, Y., "Modeling of Bubble Expansion-Induced Cell Mechanical Profile in Laser-Assisted Cell Direct Writing," *ASME J. of Manufacturing Science and Engineering*, **131**(5), 051013-1-10 (2009).
30. Li, G., "A Multilevel Component Mode Synthesis Approach for the Calculation of the Phonon Density of States of Nanocomposite Structures," *Computational Mechanics*, **42**(4), 593-606 (2008).
31. Grujicic, M., Sellappan, V., Pandurangan, B., Li, G., Seyr, N., Erdmann, A.M. and Holzleitner, J., "Computational Analysis of Injection-Molding Residual-Stress Development in Direct-Adhesion Polymer-to-Metal Hybrid Body-In-White Components," *Journal of Materials Processing Technology*, **203**(1-3), 19-36 (2008).
32. Li, G. and Aluru, N.R., "A Lagrangian Approach for Quantum-Mechanical Electrostatic Analysis of Deformable Silicon Nanostructures," *Engineering Analysis with Boundary Elements*, **30**(11), 925-939 (2006).
33. Tang, Z., Zhao, H., Li, G. and Aluru, N.R., "Finite-Temperature Quasicontinuum Method for Multiscale Analysis of Silicon Nanostructures," *Physical Review B*, **74**(6), art no. 064110 (2006).
34. Zhao, H., Tang, Z., Li, G. and Aluru, N.R., "Quasiharmonic Models for the Calculation of Thermodynamic Properties of Crystalline Silicon under Strain," *Journal of Applied Physics*, **99**(6), art. no. 064314 (2006).
35. Tang, Z., Xu, Y., Li, G. and Aluru, N.R., "Physical Models for Coupled Electromechanical Analysis of Silicon Nanoelectromechanical Systems," *Journal of Applied Physics*, **97**(11), art. no. 114304 (2005).
36. Jin, X., Li, G. and Aluru, N.R., "New Approximations and Collocation Schemes in the Finite Cloud Method," *Computers and Structures*, **83**(17-18), 1366-1385 (2005).
37. Li, G. and Aluru, N.R., "Hybrid Techniques for Electrostatic Analysis of Nanoelectromechanical Systems," *Journal of Applied Physics*, **96**(4), 2221-2231 (2004).
38. Jin, X., Li, G. and Aluru, N.R., "Positivity Conditions in Meshless Collocation Methods," *Computer Methods in Applied Methods and Engineering*, **193**(12-14), 1171-1202 (2004).
39. Li, G. and Aluru, N.R., "Efficient Mixed-Domain Analysis of Electrostatic MEMS," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, **22**(9), 1228-1242 (2003).
40. Li, G., Paulino, G.H. and Aluru, N.R., "Coupling of the Meshfree Finite Cloud Method with the Boundary Element Method: A Collocation Approach," *Computer Methods in Applied Mechanics and Engineering*, **192**(20-21), 2355-2375 (2003).
41. Li, G. and Aluru, N.R., "A Boundary Cloud Method with a Cloud-by-cloud Polynomial Basis," *Engineering Analysis with Boundary Elements*, **27**(1), 57-71 (2003).

42. Li, G. and Aluru, N.R., "A Lagrangian Approach to Compute Electrostatic Forces on Deformable MEMS," *Journal of Microelectromechanical Systems*, **11**(3), 245-254 (2002).
43. Li, G. and Aluru, N.R., "Boundary Cloud Method: A Combined Scattered Point/Boundary Integral Approach for Boundary-Only Analysis," *Computer Methods in Applied Mechanics and Engineering*, **191**(21-22), 2337-2370 (2002).
44. Jin, X., Li, G. and Aluru, N.R., "On the Equivalence Between Least-Squares and Kernel Approximation in Meshless Methods," *Computer Modeling in Engineering and Sciences*, **2**(4), 447-462 (2001).
45. Li, G. and Aluru, N.R., "Linear, Nonlinear and Mixed-Regime Analysis of Electrostatic MEMS," *Sensors and Actuators A*, vol. **91**(3), 278-291 (2001).
46. Aluru, N.R. and Li, G., "Finite Cloud Method: A True Meshless Technique Based on a Fixed Reproducing Kernel Approximation," *International Journal of Numerical Methods in Engineering*, **50**(10), 2373-2410 (2001).

### **Conference Papers**

1. Franklin, S., Fadel, G., Li, G. and Coutris, N., "The Influence of Material Property Variances and Prototyping Tolerances on the Mechanical Behavior of an Additively Manufactured Meta Material Tank Track Backed Pad," *15<sup>th</sup> International Design Conference (Design 2018)*, paper No. 549, Dubrovnik, Croatia (May, 2018).
2. I. B. Ozsoy, Y. Peng, P. Joseph, I. Luzinov, G. Li, H. Zhao, M. K. Ramasubramanian, "Mechanics of Mechanical Bonding in Carbon Fiber Reinforced Thermoplastic Polymer Composite," *SAMPE*, Baltimore, Maryland (May, 2015).
3. Li, C., Li, G. and Zhao, H., "A Molecular Dynamics Study about Two Way Tuning of Thermal Conductivity in Graphene Sheets: Strain and Doping," *Proceeding of the 13<sup>th</sup> IEEE International Conference on Nanotechnology*, Beijing, China (August 2013).
4. Bibo, A., Masana, R., King, A., Li, G., and Daqaq, M. F., "Investigating the Energy Harvesting Potential of Ferro-Fluids Sloshing in Base-Excited Containers," *SPIE Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring*, San Diego, CA (March 2012).
5. Li, H. and Li, G., "Computational Analysis of Strain Effects on Electrical Transport Properties of Crystalline Nanocomposites," *Proceedings of the 2011 ASME International Mechanical Engineering Congress and Exposition*, paper no. *IMECE2011-64641*, Denver, CO (November, 2011).
6. Chakravarthy, P. and Li, G., "On the Quality Factors of Crystalline Semiconductor Nanocomposite Resonators," *Proceedings of the 2011 ASME International Mechanical Engineering Congress and Exposition*, paper no. *IMECE2011-64626*, Denver, CO, (November, 2011).
7. Bibo, A., St. Clair, D., Sennakesavababu, V., Li, G., and Daqaq, M. F., "A Nonlinear Electromechanical Model of A Scalable Self-Excited Wind Energy Harvester," in *Proceedings of the ASME 2009 International Design and Technical*

- Conference & Computers and Information in Engineering Conference IDETC/CIE 2010, Montreal, Canada, DETC2010-28921, (2010).*
8. St. Clair, D., Stabler, C., Luo, J., Daqaq M. and Li, G., "A Smart Device for Harnessing Energy From Aerodynamic Flow Fields," *Proceedings of the 2009 ASME International Mechanical Engineering Congress and Exposition, paper no. IMECE2009-12301*, Lake Buena Vista, FL, (November 2009).
  9. Starling, T., Daqaq, M. and Li, G., "Computational Analysis of Input-Shaping Control of Torsional Microelectromechanical Mirrors," *Proceedings of the 2009 ASME International Mechanical Engineering Congress and Exposition, paper no. IMECE2009-10948*, Lake Buena Vista, FL, (November 2009).
  10. Xu, Y. and Li, G., "Modeling of Strain-Induced Phonon Thermal Conductivity Reduction in Thermoelectric Nanocomposites," *Proceedings of the ASME 2008 International Mechanical Engineering Congress and Exposition (IMECE 2008)*, Boston, MA (November, 2008).
  11. Wang, W., Li, G. and Huang, Y., "Modeling of Bubble Expansion-Induced Cell Mechanical Profile in Laser-Assisted Cell Direct Writing," *Proceedings of the 2008 International Manufacturing Science & Engineering Conference (MSEC2008)*, Evanston, IL (October 2008).
  12. Xu, Y., Li, G. and Aluru, N.R., "A Coarse-Grained Tight Binding Method for Electrostatic Analysis of Nanoelectromechanical Systems (NEMS)," *Proceedings of the 2005 NSTI Nanotechnology Conference*, Anaheim, CA (May 2005).
  13. Li, G. and Aluru, N.R., "Hybrid Techniques for Electrostatic Analysis of Nanowires," *Proceedings of the IEEE/ACM International Conference on Computer-Aided Design*, San Jose, CA (November 2004).
  14. Li, G. and Aluru, N.R., "Efficient Mixed-Domain Analysis of Electrostatic MEMS," *Proceedings of the IEEE/ACM International Conference on Computer-Aided Design*, San Jose, CA (November 2002).
  15. Li, G., Paulino, G.H. and Aluru, N.R., "Coupling of the Meshfree Finite Cloud Method with the Standard Boundary Element Method," *Proceedings of IABEM '02*, Austin, TX, (May 2002).
  16. Li, G. and Aluru, N.R., "Dynamic Analysis of Electrostatic MEMS by Meshless Methods," *Proceedings of the IEEE MSM '02*, San Juan, Puerto Rico (April 2002).
  17. Li, G. and Aluru, N.R., "A Boundary Cloud Method for Exterior Electrostatic Analysis," *Proceedings of the first MIT conference on Computational Solid and Fluid Mechanics*, MIT, Cambridge, MA (June 2001).
  18. Li, G. and Aluru, N.R., "Finite Cloud Meshless Method for Large Deformation Analysis of Structures," *Proceedings of the 2000 International Conference of Computational Engineering and Science*, Los Angeles, CA (August 2000).
  19. Li, G. and Aluru, N.R., "Finite Cloud Meshless Method for Geometrically Nonlinear Analysis of MEMS," *Proceedings of 20th International Congress of Theoretical and Applied Mechanics (ICTAM 2000)*, Chicago, IL (August 2000).
  20. Li, G. and Aluru, N.R., "Meshless Techniques for Efficient Simulation of Non-linear Behavior In Electrostatic MEMS," *Proceedings of 2000 Solid-State Sensor and Actuator Workshop*, Hilton Head Island, SC (June 2000).

21. Li, G. and Hubbard, T.J., "Etch Variation Analysis via SEGS On-Line Simulator," *Proceedings of the Symposium on Microelectronics Research & Development in Canada (MR&DCAN'98)*, Ottawa, Canada (June 1998).
22. Li, G., Hubbard, T.J. and Antonnson, E.K., "SEGS: On-line Etch Simulator," *Proceedings of the IEEE MSM '98*, Santa Clara, CA (April 1998).

### **Conference Presentations**

1. Yu, Y. and Li, G., "Scaling Analysis of Thermomechanical Models for Intrinsic Damping Calculation of Single-Crystal Silicon Resonators," *ASME International Mechanical Engineering Congress and Exposition, IMECE2017-72212*, Tampa, FL (November, 2017).
2. Ozsoy, I., Choi, H., Joseph, P., Li, G., Luzinov, I. and Zhao, H., "Mechanics of Thermoplastic Composites with Interfacial Micro-architectural Anchoring," *ASME International Mechanical Engineering Congress and Exposition, IMECE2017-72557*, Tampa, FL (November, 2017).
3. Liu, Q., Daqaq, M. and Li, G., "Multiphysics Modeling and Parametric Study of a Ferrofluid Based Electromagnetic Energy Harvester," *ASME International Mechanical Engineering Congress and Exposition, IMECE2017-72212*, Tampa, FL (November, 2017).
4. Shah, P., Gandra, C., Pilla, S. and Li, G., "Factory Layout Design and Cost Modeling of a Carbon Fiber Reinforced Thermoplastic Composite Vehicle Door Assembly," *The Fiber Society's 2017 Fall Technical Meeting and Conference and 2nd International Symposium on Materials From Renewables*, Athens, GA (November, 2017).
5. Kothari, A., Ozsoy, I. Aditya, V., Li, G. and Pilla, S., "Design Optimization of a Carbon Fiber Reinforced Thermoplastic Composite Vehicle Door Assembly for Weight Reduction," *17<sup>th</sup> Annual Society of Plastics Engineers Automotive Composites Conference & Exhibition*, Novi, MI (September, 2017).
6. Shah, P., Gandra, C., and Li, G., "Cost Modeling and Estimation of a Carbon Fiber Reinforced Thermoplastic Composite Vehicle Door Assembly," *17<sup>th</sup> Annual Society of Plastics Engineers Automotive Composites Conference & Exhibition*, Novi, MI (September, 2017).
7. Kulkarni, N., Fadel, G. M., Li, G., Coutris, N., Castanier, M. P., Ostberg, D. and Cardine, C. V., "Reliability-Based Design Optimization of Tank Track Pad Meta-Material using the Unit Cell Synthesis Method," *22<sup>nd</sup> Annual ARC Program Review Meeting*, Ann Arbor, MI (2016).
8. Satterfield, Z. T., Kulkarni, N., Fadel, G. M., Li, G., Coutris, N., Castanier, M. P., Ostberg, D. and Cardine, C. V., "Design and Optimization of a Tank Track Pad Meta-Material," *21<sup>st</sup> Annual ARC Program Review Meeting*, Ann Arbor, MI (2015).
9. Lan, J. and Li, G., "Nonlinear Finite Temperature Multiscale Dynamic Analysis of Nanostructures using Component Mode Synthesis," *ASME International Mechanical Engineering Congress and Exposition, IMECE2014-38462*, Montreal, Quebec, Canada (November, 2014).

10. Yu, Y. and Li, G., "Numerical Modeling on Thermoelastic Damping of Single Crystal Silicon Nano-Resonator using Non-Gray BTE," *ASME International Mechanical Engineering Congress and Exposition*, IMECE2014-38480, Montreal, Quebec, Canada (November, 2014).
11. Liu, Q. and Li, G., "Modeling and Simulation of Electromagnetic Ferrofluid-Based Energy Harvesters," *ASME International Mechanical Engineering Congress and Exposition*, IMECE2013-65727, San Diego, CA, (November, 2013).
12. Li, C., Li, G. and Zhao, H., "A Molecular Dynamics Study of Thermal Conductivity Design and Manipulation of Graphene," *ASME International Mechanical Engineering Congress and Exposition*, IMECE2013-65782, San Diego, CA, (November, 2013).
13. Yu, Y. and Li, G., "Effect of Ballistic Thermal Transport on Thermoelastic Energy Dissipation in Crystalline Nanocomposite Resonators," *ASME International Mechanical Engineering Congress and Exposition*, IMECE2012-88770, Houston, TX, (November, 2012).
14. Li, H. and Li, G., "Computational Analysis of Thermoelectric Properties of Nanoporous Silicon," *ASME International Mechanical Engineering Congress and Exposition*, IMECE2012-88767, Houston, TX, (November, 2012).
15. Xu, Y and Li, G., "Strain Effects on the figure of merit of nanocomposite thermoelectric materials," *ASME International Mechanical Engineering Congress and Exposition*, IMECE2011-64556, Denver, CO, (November, 2011).
16. Lan J and Li, G., "A Component Mode Synthesis Approach for Multiscale Dynamic Analysis of Nanostructures," *Proceedings of the 11th U.S. National Congress on Computational Mechanics*, Minneapolis, MN (July 2011).
17. Xu, Y. and Li, G. "Thermal Actuation using Nanocomposites: A Computational Analysis," *the 2010 ASME International Mechanical Engineering Congress and Exposition*, Abstract no. IMECE2010-39142, Vancouver, Canada (November 2010).
18. Li, H. and Li, G. "A Multilevel Component Mode Synthesis Approach for Quantum Mechanical Electrostatic Analysis," *the 2010 ASME International Mechanical Engineering Congress and Exposition*, Abstract no. IMECE2010-39142, Vancouver, Canada (November 2010).
19. Li, G., "A Multi-Level Component Mode Synthesis Approach for Atomistic-To-Continuum Coupling," *the 2009 ASME International Mechanical Engineering Congress and Exposition*, Abstract no. IMECE2009-10954, Lake Buena Vista, FL, (November 2009).
20. Li, G., "A Multiscale Approach for Thermal Transport Analysis of Nanocomposites", *the 2009 ASME International Mechanical Engineering Congress and Exposition*, Abstract no. IMECE2009-10945, Lake Buena Vista, FL, (November 2009).
21. V. Bachina and G. Li, "Efficient Calculation of Phonon Thermal Conductivity for 2-D Nanocomposites With Randomly Distributed Inclusions", *the 2009 ASME International Mechanical Engineering Congress and Exposition*, Abstract no. IMECE2009-10946, Lake Buena Vista, FL, (November 2009).

22. Li, G., "A Multiscale Approach for Thermal Transport Analysis of Nanocomposites," *Proceedings of the ASME 2009 International Mechanical Engineering Congress and Exposition (IMECE 2009)*, Lake Buena Vista, FL (November, 2009).
23. Bachina, V. and Li, G., "Efficient Calculation of Phonon Thermal Conductivity for 2-D Nanocomposites with Randomly Distributed Inclusions," *Proceedings of the ASME 2009 International Mechanical Engineering Congress and Exposition (IMECE 2009)*, Lake Buena Vista, FL (November, 2009).
24. Li, G., "A Multilevel Component Mode Synthesis Approach for Atomistic-To-Continuum Coupling," *Proceedings of the ASME 2009 International Mechanical Engineering Congress and Exposition (IMECE 2009)*, Lake Buena Vista, FL (November, 2009).
25. Li, G., "Multiscale Calculation of Phonon Density of States for Nanocomposite Structures," *Proceedings of the 9th U.S. National Congress on Computational Mechanics*, San Francisco, CA (July 2007).
26. Aluru, N.R., Li, G. and De, S., "Computational MEMS," *Proceedings of the 8th U.S. National Congress on Computational Mechanics*, Austin, TX (July 2005).
27. Tang, Z., Xu, Y., Zhao, H., Li, G. and Aluru, N.R., "Multiscale Modeling of Electrostatic Nanoelectromechanical Systems (NEMS)," *Proceedings of the 8th U.S. National Congress on Computational Mechanics*, Austin, TX (July 2005).
28. Li, G. and Aluru, N.R., "A Boundary Cloud Method for Boundary-only Analysis of 2-D Potential Problems," *Proceedings of the 6th U.S. National Congress on Computational Mechanics*, Dearborn, MI (August 2001).
29. Li, G. and Aluru, N.R., "A Hybrid Finite Cloud/Boundary Cloud Method for Two-Dimensional Analysis of Coupled Electro-Mechanical Devices," *Proceedings of the 6th U.S. National Congress on Computational Mechanics*, Dearborn, MI (August 2001).

## **INVITED SEMINAR AND PRESENTATIONS**

1. Li, G., "Lightweighting with Thermoplastic Composites: Interfacial Bonding through Mechanical Interlocking," Presentation and Panel Discussion, International Conference on Automotive Engineering, Greenville, South Carolina, USA (February, 2018).
2. Li, G., "Strain Effects on Nanoscale Phonon Thermal Transport and Thermomechanical Modeling of Nanomaterials," Changchun University of Science and Technology, Changchun, China (2017).
3. Li, G., "Modeling Phonon and Electron Transport in Nanomaterials," Zhejiang University, Hangzhou, China (2017).
4. Li, G., "Strain Effects on Nanoscale Phonon Thermal Transport and Thermomechanical Modeling of Nanomaterials," New York University Abu Dhabi, Abu Dhabi, UAE (2017).

5. Li, G., "Strain Effects on Energy Conversion Efficiency of Nanocomposite Thermoelectric Materials," Nanoscale Science and Engineering Center, University of Georgia (2011).
6. Li, G., "Strain Effects on Thermal Transport in 2-D Nanocomposites," the 2008 International Conference on Computational and Experimental Engineering and Sciences, Honolulu, HI (2008).
7. Li, G., "Coupled Electromechanical Analysis of Micro And Nanoelectromechanical Systems (MEMS/NEMS) By Using Meshless Methods," Department of Mathematical Science, Clemson University (2006).

## **PATENTS**

1. "Self-Excited Piezoelectric Micropower Generators," USA, Provisional Patent, 61/381,106, with M. F. Daqaq.

## **SPONSORED RESEARCH (TOTAL VALUE: \$7,701,044, LI'S SHARE \$2,939,458 INCLUDING \$1,068,000 COST SHARE)**

- "Enabling Industry 4.0 for Multi-tiered Quality and Process Control in Precision Manufacturing of Composites," SC Research Authority (SCRA), Co-Principle Investigator, \$100,000 (5%), (2018-2019).
- "Drivetrain Model Characterization – Rotor Loads," Clemson Energy Innovation Center (EIC) at Charleston, Principle Investigator, \$30,000 (100%), (2018).
- "Systems Approach to Wheel and Pad Metamaterial Design Including Robustness Issues," U.S. Army through University of Michigan, Co-Principle Investigator, \$80,000 (50%), (2018-2019).
- "Systems Approach to Wheel and Pad Metamaterial Design Including Robustness Issues," U.S. Army through University of Michigan, Co-Principle Investigator, \$94,764 (50%), (2017-2018).
- D. W. Reynolds Emerging Faculty Scholar Professorship, Clemson University, Principle Investigator, \$30,000 (100%), (2016-2018).
- "Functionally Designed Ultra-Lightweight Carbon Fiber Reinforced Thermoplastic Composites Door Assembly," U.S. Department of Energy, Co-Principle Investigator, \$5,810,000 (including \$3,560,000 cost share) (30%), (2015-2019).
- "Meta-Materials for Tank Tread Backer Pads," U.S. Army through University of Michigan, Co-Principle Investigator, \$66,100 (50%), (2016).
- "Meta-Materials for Tank Tread Backer Pads," U.S. Army through University of Michigan, Co-Principle Investigator, \$96,151 (25%), (2015-2016).
- "Clemson Engineering and Science Online Course Development Grant", Clemson University, Principle Investigator, \$7,500 (100%), (2015).
- "Meta-Materials for Tank Tread Backer Pads," U.S. Army through University of Michigan, Co-Principle Investigator, \$118,081 (50%), (2014-2015)

- “Exploiting Liquid-State Transduction Materials in Vibratory Energy Harvesting,” National Science Foundation, Co-Principle Investigator, \$360,000 (50%), (2013-2016).
- “Novel Techniques for Probing Defect-Induced Electrical, Thermal and Optical Properties at the Nanoscale,” Clemson CoES Transformative Initiative for Generating Extramural Research (TIGER), Clemson University, Co-Principle Investigator, \$20,000 (10%), (2013).
- “CAREER: Multiscale Thermomechanical Analysis of Nanomaterials and Nanostructures,” National Science Foundation, Principle Investigator, \$400,000 (100%), (2010-2015).
- “A Novel Concept for Micro-Power Generation Using Flow-Induced Self-Excited Oscillations,” National Science Foundation, Co-Principle Investigator, \$250,000 (40%), (2010-2013).
- “Multiscale Computational Analysis of Nanoelectromechanical Systems (NEMS),” National Science Foundation, Principle Investigator, \$238,448 (100%), (2008-2012).

## **GRADUATE STUDENT ADVISING**

### **Doctoral Graduates**

- Qi Liu (PhD), “Computational Analysis of Ferro-Fluid Based Energy Harvesters,” (August 2018).
- Jixuan Gong (PhD), “Nonlocal Elasticity and Acoustics in Nanostructured Materials,” (May 2018).
- Ying Yu, “Thermomechanical Modeling for Phonon Transport and Damping Analysis of Silicon Nanostructures,” (August 2016).
- Chengjian Li, “Thermal Transport Properties of Graphene with Hydrogenation Doping by Molecular Dynamics Simulations,” (August 2015).
- Jun Lan, “A Multiscale Component Synthesis Method for Dynamic Analysis of Nanostructures,” (August 2015).
- Hua Li, “Component Mode Synthesis Based Multiscale Electrostatic Analysis of NEMS,” (May 2014).
- Yaoyao Xu, “Modeling of Strain Effect on Thermal and Electrical Transport Properties of Si/Ge Nanocomposites and Its Applications,” (August 2011).

### **Masters Graduates (Thesis)**

- Rajiv Yadav (MS, Thesis), “Fluid Dynamics of Galloping Tailed Bluff Body,” (May 2017).
- Shanyun Gao (MS, Thesis), “Design of Nonlinear Meta Materials,” (August 2016).
- Songkai Wang (MS, Thesis), “Computational Optimization of Harmonica Type Aeroelastic Micropower Generator,” (May 2014).
- Mayank Malladi (MS, Thesis), “Phonon Transport Analysis of Semiconductor Nanocomposites using Monte Carlo Simulations,” (November, 2013).

- Zhe Gao (MS, Thesis), “A Component Mode Synthesis Approach for Electrodynamic Analysis of Nanocomposites,” (May 2012).
- Bargav Cheruku (MS, Thesis), “Modeling and Finite Element Analysis of Fluid Structure Interaction in a Wind Energy Harvester,” (August 2011).
- Puroorava Chakravarthy (MS, Thesis), “Molecular Dynamics Study of Particle Impact Induced Bond Breaking of Single-Walled Carbon Nanotubes and Quality Factors of Nanocomposite Structures,” (August 2011).
- Thomas Starling (MS, Thesis), “Modeling and Optimization of MEMS Open-Loop Control,” (December 2008).

### **Masters Graduates (Non-Thesis)**

- Venkat Sennakesavabab (MS, Non-Thesis), “A Smart Device for Harnessing Energy From Aerodynamic Flow Fields: Computational Studies,” (December, 2010).
- Vidya Sagar Bachina (MS, Non-Thesis), “Efficient Calculation of Thermal Conductivity of Nano Composite Materials,” (August, 2009).
- Kalyan Neelam (MS, Non-Thesis), “Thermal Conductivity Modeling of Fiber Composite Materials: From Micro to Nano,” (December 2007).

### **Current Graduate Advising**

- Anmol Kothari (PhD), “Modeling and Analysis of Thermoplastic Composites with Interfacial Micro-Architectural Anchoring,” (August 2020).
- Madhura Limaye (PhD), “Thermal Forming of Carbon Fiber Reinforced Thermoplastic Composites: Manufacturing to Performance Pathway for Optimization,” (August 2021).
- Aishwarya Patwardhan MS, Thesis), “Meta-Material Optimization for Nonlinear Stress-Strain Responses,” (May 2019).
- Nathan Beasley (MS, Thesis), “Drivetrain Model Characterization – Rotor Loads,” (May 2019).

### **Post Doctoral Research Advisees**

- Istemi Ozsoy, “Modeling and Analysis of Thermoplastic Composites with Interfacial Micro-Architectural Anchoring,” (2014-2016).
- Istemi Ozsoy, “Design Optimization of a Carbon Fiber Reinforced Thermoplastic Composite Vehicle Door Assembly for Weight Reduction,” (2016-2017).

## **UNDERGRADUATE STUDENT ADVISING**

### **ME 415/H415 Undergraduate Research**

- Nathan Beasley, “Cost Modeling and Design for Manufacturing of Carbon Fiber Reinforced Thermoplastic Composite Door Assembly,” (Fall 2016-Summer 2017).

- Dylan Cronin, “Molecular Dynamics Study on Electromagnetic Properties of Ferrofluid under Dynamic Excitations,” (Fall 2013-Fall 2014).
- Yang Wang, “Development of an Online Finite Element Mechanical Analysis Tool,” (Fall 2012).
- Nick Walsh, “Comparison of Models for the Calculation of Mechanical Properties of Composite Materials,” (Spring 2011).

## **VISITING SCHOLARS**

- Hang Xiu, Changchun University of Science and Technology, January 2018-December 2018.
- Jia Chen, Nanjing University of Science and Technology, March 2017-February 2018.
- Wei Li, Zhejiang University Ningbo Institute of Technology, September 2016-August 2017.
- Hongping Wang, Changchun University of Science and Technology, September 2015-August 2016.
- Jianhe Liu, Changchun University of Science and Technology, January 2016-December 2016.

## **STUDENT HONORS AND AWARDS**

- Anmol Kothari, Third Place, Best PhD Student Poster Presentation, “Design Optimization of a Carbon Fiber Reinforced Thermoplastic Composite Vehicle Door Assembly for Weight Reduction,” *17<sup>th</sup> Annual SPE Automotive Composites Conference & Exhibition*, Novi, MI (2017)
- Neehar Kulkarni, First Place, Best Student Poster Award, “Reliability-Based Design Optimization of Tank Track Pad Meta-Material using the Unit Cell Synthesis Method,” *22<sup>nd</sup> Annual ARC Program Review Meeting*, Ann Arbor, MI (2016)
- Zachary Satterfield, Best Student Poster Award Finalist, “Design and Optimization of a Tank Track Pad Meta-Material,” *21<sup>st</sup> Annual ARC Program Review Meeting*, Ann Arbor, MI (2015)
- Hua Li, Travel Award, NSF CMMI Grantees Conference, (2010)

## **TEACHING**

### **Courses Developed**

- ME 4320/6320 Hybrid, Advanced Mechanics of Materials, S15
- ME 4180 Online, Finite Element Analysis in Mechanical Design, Su14.
- ME 8930, Introduction to Computational Nanomechanics, F11.
- ME 8930, Continuum Mechanics, F18

## **Courses Taught**

- ME 2040, Mechanics of Materials, F07, S08, S09, Su09, F09, Su10, F10, F11, S12, S13, S16, F16, S17, F17, S18
- ME 4020, Internship in Engineering Design, F08, S10, S13
- ME 4150, Undergraduate Research, S11, F12, F13, F16, S17
- ME 4180, Finite Element Analysis in Mechanical Design, S10, S11, S12, F12, F13, F14, F15, S17
- ME 4300/6300, Mechanics of Composite Materials, F13
- ME 4320/6320, Advanced Mechanics of Materials, S09, S10, S11, S12, S13, S14
- ME 8180, Introduction to Finite Element Analysis, F06, F08, F09, F10, F12, F16, F18
- ME 8520, Advanced Finite Element Analysis, S07, S08, S14, S16
- ME 8930, Introduction to Computational Nanomechanics, F11
- ME 8930, Continuum Mechanics, F18

## **UNIVERSITY AND PUBLIC SERVICE**

### **Committees**

- College: Member, College Curriculum Committee (2017-2018)  
Member, College Honors and Awards Committee (2014-2015)
- Department: Chair, Graduate and Research Committee (2018- 2019)  
Chair, Undergraduate and Graduate Curriculum Committee (2017-2018)  
Chair, Merit Evaluation Ad hoc Committee (2018)  
Chair, Honors, Awards and Scholarships Committee (2014-2015)  
Chair, Faculty Search Committee (2013-2014)  
Member, Assessment Committee (2015-2016)  
Member, Research Committee (2013-2014)  
Member, Department Chair Search Committee (2017-2018)  
Member, Faculty Search Committee (2010-2011, 2012-2013, 2017-2018)  
Member, Curriculum, Lab and International Committee (2010-2012, 2016-2017)  
Member, Computer Utilization Committee (2006-2008)  
Member, Graduate and Research Committee (2007-2008, 2011-2012)

## **Other Service**

- Department: Chair, Applied Mechanics Group (10 faculty members) (2012- )  
Faculty Mentor of Dr. Huijuan Zhao (2012-2014)  
Teaching Mentor of ASME Teaching Fellow Ben Caldwell (2010)

## **MISCELLANEOUS**

### **Software Development**

- SEST 2.0: strain effects on thermodynamic properties of single crystal Silicon (research); software written in C/C++ and Java; version 2.0; source code available upon request.
- Graphene Generator 2D: for creating two dimensional periodic or finite size grapheme lattices with or without defects; software written in Java; source code available upon request.
- Mohr's Circle: an online tool for obtaining Mohr's circle corresponding to any given state of stress and perform arbitrary 2-D stress transformations; online software; website: [http://cecas.clemson.edu/~gli/software/mohr/mohr\\_circle.html](http://cecas.clemson.edu/~gli/software/mohr/mohr_circle.html)
- FELES 2D: an online finite element analysis tool for quasi-static mechanical analysis of 2-D linear elastic structures; software written in C/C++ and Java; source code available upon request.