

Yanyan He

CONTACT INFORMATION	E-mail: yanyan.he@unt.edu Website: https://yanyanhe13.wixsite.com/yanyanhe	1155 Union Cir Denton, TX76203
RESEARCH INTERESTS	Uncertainty Quantification, Uncertainty Modeling, Bayesian Methods, Computational Statistics, Monte Carlo Methods, Uncertainty Visualization, Uncertain Data Fusion, Fuzzy Sets, Fuzzy Measures, Image Processing	
EMPLOYMENT	University of North Texas Assistant Professor, Department of Math, and of CSE (Aug 2019 - present) New Mexico Institute of Mining and Technology Assistant Professor, Department of Mathematics (Aug 2016 - Jul 2019) The University of Utah Postdoctoral Fellow, Scientific Computing and Imaging Institute (Jul 2016) Advisors: Professor Mike Kirby and Professor Dongbin Xiu	
EDUCATION	Florida State University Ph.D., Applied and Computational Mathematics (Dec 2013) M.S., Applied and Computational Mathematics (May 2010) Advisor: Professor M. Yousuff Hussaini Huazhong University of Science and Technology M.S., Computational Mathematics (Dec 2007) B.S., Computational Mathematics (Apr 2004)	
RESEARCH	Awarded Research Grants <ul style="list-style-type: none">W911NF-12-2-0023: U.S. Army Research Laboratory HBCU/MI Partnered Research Initiative program (Sub-recipient PI), “Material Design under Uncertainty”, Nov 2016 - Nov 2020. Publications in Refereed Journals <ol style="list-style-type: none">J. Chilleri, Y. He, D. Bedrov, and M. R. Kirby. Optimal allocation of computational resources based on Gaussian process: Application to molecular dynamics simulations. <i>Computational Materials Science</i>, 188(2021): 110178.L. D. Waldrop, Y. He, N. A. Battista, T. N. Peterman and L. A. Miller. Uncertainty quantification reveals the physical constraints on pumping by peristaltic hearts. <i>J. R. Soc. Interface</i>, 17(2020): 20200232.L. D. Waldrop, Y. He, T. L. Hedrick and J. Rader. Functional morphology of gliding flight I. Modeling reveals distinct performance landscapes based on soaring strategies. <i>Integrative and Comparative Biology</i>, 60(5)(2020): 1283–1296.	

4. J. Rader, T. L. Hedrick, **Y. He** and L. D. Waldrop. Functional morphology of gliding flight II. Morphology follows predictions of gliding performance. *Integrative and Comparative Biology*, 60(5)(2020): 1297-1308.
5. **Y. He**, J. Chilleri, S. K. O'Leary, M. Shur and R. Kirby. Sensitivity analysis for an electron transport system: application to the case of wurtzite gallium nitride. *Journal of computational Electronics*, 19(1)(2020): 103-110.
6. M. Razi, R. Wang, **Y. He**, R. Kirby and L. Dal Negro. Optimization of large-scale vogel spiral arrays of plasmonic nanoparticles. *Plasmonics*, 14(1)(2019): 253-261.
7. L. Waldrop, **Y. He** and S. Khatri. What can computational modeling tell us about the diversity of odor-capture structures in the pancrustacea? *J. Chem. Ecol.*, 44(12)(2018): 1084-1100.
8. **Y. He**, M. Razi, C. Forestiere, L. Dal Negro and R. Kirby. Uncertainty quantification guided robust design for nanoparticles' morphology. *Comput. Methods Appl. Mech. Eng.*, 336(2018): 578-593.
9. A. Bhaduri, **Y. He**, M. D. Shields, L. Graham-Brady and R. Kirby. Stochastic collocation approach with adaptive mesh refinement for parametric uncertainty analysis. *J. Comput. Phys.*, 371(2018): 732-750.
10. **Y. He** and D. Xiu. Numerical strategy for model correction using physical constraints. *J. Comput. Phys.*, 313(2016): 617-634.
11. C. Forestiere, **Y. He**, R. Wang, R. Kirby and L. Dal Negro. Inverse design of metal nanoparticles' morphology. *ACS Photonics*, 3(1)(2016): 68-78.
12. **Y. He**, M. Y. Hussaini, Y. Gong and Y. Xiao. Optimal unified combination rule in application of Dempster-Shafer theory in lung cancer radiotherapy dose response outcome analysis. *J. Appl. Clin. Med. Phys.*, 17(1)(2016): 4-11.
13. X. Chen, **Y. He** and D. Xiu. An efficient method for uncertainty propagation using fuzzy sets. *SIAM J. Sci. Comput.*, 37(6)(2015): A2488-A2507.
14. **Y. He**, M. Mirzargar, S. Hudson, R. M. Kirby and R. T. Whitaker. An uncertainty visualization technique using possibility theory: possibilistic marching cubes. *Int. J. Uncertain. Quantif.*, 5(5)(2015): 433-451.
15. **Y. He**, M. Mirzargar and R. M. Kirby. Mixed aleatory and epistemic uncertainty quantification using fuzzy set theory. *Int. J. Approx. Reason.*, 66(2015): 1-16.
16. C. Wang, Z. Qiu and **Y. He**. Fuzzy interval perturbation method for uncertain heat conduction problem with interval and fuzzy parameters. *Int. J. Numer. Meth. Eng.*, 104(52)(2015): 330-346.
17. C. Wang, Z. Qiu and **Y. He**. Fuzzy stochastic finite element method for the hybrid uncertain temperature field prediction. *Int. J. Heat Mass Tran.*, 91(2015): 512-519.
18. **Y. He**, M. Y. Hussaini, J. Ma, B. Shafei and G. Steidl. A new fuzzy c-means method with total variation regularization for segmentation of images with noisy and incomplete data. *Pattern Recognition*, 45(9)(2012): 3463-3471.
19. W. Chen, Y. Cui, **Y. He**, Y. Yu, J. Galvin, M. Y. Hussaini and Y. Xiao. Application of Dempster-Shafer theory in dose response outcome analysis. *Phys. Med. Biol.*, 57(17)(2012): 5575-5585.
20. **Y. He**, B. Shi and Y. Yang. Complete complementary codes based on shifted multiphase sequences (in Chinese). *Signal Processing*, 23(6)(2007): 941-945.

21. Y. Yang, B. Shi and **Y. He**. A class of unified constructions of sequence sets with zero (low) correlation zone (in Chinese). *Telemetry and Telecontrol*, 4(2007): 7-11.

Publications in Refereed Conference Proceedings

22. **Y. He** and M. Y. Hussaini. Constructing belief functions using the principle of minimum uncertainty. 2020 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Glasgow, United Kingdom, 2020, pp. 1-7, doi: 10.1109/FUZZ48607.2020.9177795.
23. M. Mirzargar, **Y. He** and R. M. Kirby. Application of uncertainty modeling frameworks to uncertain isosurface extraction. IUKM 2015: 4th International Symposium on Integrated Uncertainty in Knowledge Modeling and Decision Making, Nha Trang, Vietnam, Oct 2015, Proceedings, V. Huynh, M. Inuiguchi and T. Denoeux (editors), Lecture Notes in Computer Science, 2015, 9376: 336-349.
24. **Y. He** and M. Y. Hussaini. An optimal unified combination rule. BELIEF2014: 3rd International Conference on Belief Functions, Oxford, UK, Sep 2014, Proceedings, F. Cuzzolin (editor), Lecture Notes in Artificial Intelligence, 2014, 8764: 39-48.
25. S. V. Poroseva, **Y. He**, M. Y. Hussaini and R. R. Mankbadi. Uncertainty quantification in the horizontal projection of flight plan trajectories using evidence theory. 13th AIAA Non-Deterministic Approaches Conference, AIAA2011-1759, Denver, CO, Apr 2011.
26. **Y. He**, M. Y. Hussaini, S. V. Poroseva and R. R. Mankbadi. Uncertainty quantification in flight plan horizontal path using evidence theory. Florida Center for Advanced Aero-propulsion (FCAAP) Annual Technical Symposium and Exhibition, Tallahassee, FL, Aug 2010.
27. S. V. Poroseva, **Y. He**, M. Y. Hussaini, J. J. Pesce and R. R. Mankbadi. Uncertainty quantification in flight plans using evidence theory: departure and arrival times. 12th AIAA Non-Deterministic Approaches Conference, AIAA2010-2678, Orlando, FL, Apr 2010.

Conferences and Invited Talks

- Data-driven surrogate construction based on optimal allocation of computational resources and physical constraints. ARL MSME CRA Fall 2020 Seminar Series, virtual, Dec 2020.
- Constructing belief functions using the principle of minimum uncertainty. IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Glasgow, United Kingdom, Jul 2020.
- Numerical Approaches and Applications for Uncertainty Quantification. Millican Colloquium, Department of Mathematics, UNT, Oct 2019.
- Non-probabilistic numerical approaches for uncertainty quantification. Millican Colloquium, University of North Texas, Denton, TX, Feb 2019.
- Numerical approaches and applications for uncertainty quantification. Math Colloquium, University of Washington Tacoma, Tacoma, WA, Feb 2019.
- Efficient numerical techniques and applications of uncertainty quantification. ARL MSME CRA Fall 2018 Seminar Series, virtual, Dec 2018.
- Numerical Strategy for Model Correction using Physical Constraints. SIAM Conference on Computational Science and Engineering, Atlanta, GA, Feb 2017.
- Inverse Design of Metal Nanoparticles' Morphology. Mach Conference, Annapolis, MD, Apr 2016.
- Uncertainty Quantification beyond Probabilistic Modeling. University of Massachusetts Dartmouth, Dartmouth, MA, Feb 2016.

- Non-probabilistic approaches for epistemic uncertainty quantification. SIAM Conference on Analysis of Partial Differential Equations, Scottsdale, AZ, Dec 2015.
- Uncertainty Quantification Using Dempster-Shafer Theory. Huazhong University of Science and Technology, Wuhan, Hubei, China, Jul 2015.
- An efficient method for uncertainty propagation using fuzzy sets. SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 2015.
- SIAM Conference on Uncertainty Quantification, Savannah, GA, Mar 2014.
- Uncertainty quantification and data fusion using Dempster-Shafer theory. University of Utah, Salt Lake City, UT, Oct 2013.
- Uncertainty quantification and application of fuzzy measures. SUNY Buffalo, Buffalo, NY, Oct 2013.
- Data fusion based on evidence theory. The Second Pacific Rim Mathematical Association Congress, Shanghai, China, Jun 2013.
- Workshop on Advances in Computational Mathematics and Engineering, Tallahassee, FL, Sep 2012.
- SIAM Conference on Uncertainty Quantification, Raleigh, NC, Apr 2012.
- Uncertainty quantification in quasi-one-dimensional nozzle flow. Joint Mathematical Meeting, Boston, MA, Jan 2012.
- Uncertainty quantification in flight plan horizontal path using evidence theory, Florida Center for Advanced Aero-propulsion (FCAAP) Annual Technical Symposium and Exhibition, Tallahassee, FL, Aug 2010.
- AIAA Non-Deterministic Approaches Conference, Orlando, FL, Apr 2010.

TEACHING

- Supervisor: Supervised/supported undergraduate/graduate research projects.
 - Graduate research on Bayesian Neural Network (UNT).
 - Graduate research on Gaussian process (UNT).
 - Graduate research on the application of uncertainty quantification to electronic devices (NMT).
 - Graduate research on optimization of cost to construct proper Gaussian process (NMT).
 - Undergraduate research on the installation and implementation of UQ software Dakota (NMT).
 - Undergraduate research on the l-1 norm optimization (NMT).
 - Undergraduate research on uncertainty visualization (U of U).
- Course instructor for:
 - MATH5290/CSCE5230 - Numerical Methods (UNT)
 - MATH3350-Introduction to Numerical Analysis (UNT)
 - MATH352-Basic Concepts of Mathematics (NMT)
 - MATH410-Numerical Methods I (NMT)
 - MATH335-Ordinary Differential Equations (NMT)
 - MATH132-Calculus II (NMT)
 - MATH411-Numerical Linear Algebra (NMT)
 - MAC1140-Precalculus (FSU)
 - Designed syllabus, lesson materials, homework problems and quizzes.
 - Utilized document camera, handouts, and computer software (Matlab) for lectures.
 - Used an e-learning software (Blackboard, Canvas) to post notes, assignments and grades.

- Encouraged students to present their work.
- Teaching assistant: MAC1105-College Algebra, MAC1114-Trigonometry, MAC2233-Business Calculus.
- PIE Conference (FSU): attended the program for instructional excellence (PIE) graduate student teaching conference and completed requirements for the PIE certificate.

COMMITTEE SERVICE

- UNT Committee Member for Applied Math Qualifying Exam Committee, Sep 2019 - Sep 2020.
- UNT Committee Member for CSCE Faculty Search Committee, Sep 2019 - Apr 2020.
- UNT Committee Member for Math Postdoc Recruitment Group, Sep 2019 - Apr 2020.
- UNT Committee Member for CSCE Awards and Scholarship Committee, Sep 2019 - Sep 2020.
- New Mexico Tech graduate students thesis committee member, Jan 2017 - May 2017.
- New Mexico Tech Master of Science for Teachers Program students committee chair, July 2017 - Aug 2019.
- New Mexico Tech Preliminary exam committee member, Aug 2016 - Aug 2019.
- Mathematics committee member (judge) for 65th New Mexico Science and Engineering Fair, 2017.

HONORS

- Postdoctoral Travel Grant from University of Utah, Oct 2015.
- Travel Funding from NSF Grant administered at University of Washington, May 2013.
- Grad Student Travel Grant from AMS, Jan 2012.
- Grad Student Travel Grant from Florida State University, Jan 2012.