ZHAOHUI GENG

Website: zhaohuigeng.github.io
Address: EASFC 1.316H, 1201 W University Dr., Edinburg, TX 78539
EMAIL: zhaohui.geng@utrgv.edu **Phone:** (412) 944-7917

RESEARCH INTERESTS

- **Advanced Manufacturing**: *Reverse engineering; Additive manufacturing; Quality control and optimal process planning; Tolerance modeling, analysis and synthesis.*
- **Engineering Statistics**: *High-dimensional statistical shape analysis and inference; Probabilistic/Bayesian machine learning; Experimental design; Statistical quality control; Statistical learning and inference.*

ACADEMIC EXPERIENCES

Assistant Professor 2021,8-now
Department of Manufacturing and Industrial Engineering
The University of Texas Rio Grande Valley

Health Sciences Research Fellow 2021.5 - 2021.8
Department of Neurological Surgery, and Neurology at the University of Pittsburgh Medical Center, Department of Neurological Surgery and Department of Biomedical Informatics of the School of Medicine at the University of Pittsburgh

Graduate Student Researcher / Lecturer 2016.1 - 2021.5
Department of Industrial Engineering
University of Pittsburgh

EDUCATION

Ph.D. in Industrial Engineering 2021.8
University of Pittsburgh

- *Dissertation Topic*: Volumetric data analysis for reverse engineering and solid additive manufacturing: A framework for geometric metrological analysis
- *Advisor*: Dr. Bopaya Bidanda
- *Committee Members*: Drs. Arman Sabbaghi, Jayant Rajgopal, Xiayun Zhao, Mostafa Bedewy

Master of Arts in Statistics 2018.4
University of Pittsburgh

Master of Science in Industrial Engineering 2016.4
University of Pittsburgh

Bachelor of Engineering in Electronic Science and Technology 2014.6
Nankai University

PUBLICATIONS

Journal Publications (Published)

5. **Z. Geng**, B. Bidanda (2021). Tolerance Estimation and Metrology for Reverse Engineering based Remanufacturing Systems. *International Journal of Production Research*, 1-14.
4. **Z. Geng**, B. Bidanda (2021). Geometric Precision Analysis for Additive Manufacturing Processes: A Comparative Study. *Precision Engineering* (**Invited**), 69, 68-76.
3. **Z. Geng**, B. Bidanda (2017). Review of Reverse Engineering Systems - Current State of the Art. *Virtual and Physical Prototyping* (**Invited Review**), 12(2), 161-172.
2. Z. Zhang, **Z. Geng**, D. Cai, T. Pan, Y. Chen, L. Dong, and T. Zhou (2015). Structure, Electronic and Magnetic Properties of Hexagonal Boron Nitride Sheets Doped by 5d Transition Metal Atoms: First-Principles Calculations and Molecular Orbital Analysis, *Physica E: Low-dimensional Systems and Nanostructures* 65, 24-29.
1. Z. Zhang, **Z. Geng**, P. Wang, Y. Hu, Y. Zheng, and T. Zhou (2013). Properties of 5d Atoms Doped Boron Nitride Nanotubes: A First-Principles Calculation and Molecular Orbital Analysis, (in Chinese) *Acta Physica Sinica*, 62(24), 246301.

Journal Publications (Under Revision/Under Review)

4. **Z. Geng**, A. Sabbaghi, B. Bidanda (2021). Reconstructing Original Design: Process Planning for Reverse Engineering. Revision at *IISE Transactions*.
3. **Z. Geng**, A. Sabbaghi, B. Bidanda (2021). A Framework of Tolerance Specification for Freeform Point Clouds and Capability Analysis for Reverse Engineering Processes. Revision at *International Journal of Production Research*.
2. **Z. Geng**, A. Sabbaghi, B. Bidanda (2021). Automated Variance Modeling for Three-Dimensional Point Cloud Data via Bayesian Neural Networks. Revision at *IISE Transactions*.
1. **Z. Geng**, B. Bidanda (2021). Utilizing Dual Functionalities of Reverse Engineering in Additive Manufacturing: Metrology and Quality Implications. Revision at *Manufacturing Letters*.

Manuscripts in Preparation

2. **Z. Geng**, A. Sabbaghi, B. Zeng, B. Bidanda. Automated Metrology Planning for 3D Scanning of a Freeform Design using Bayesian Optimization.
1. **Z. Geng**, B. Zeng, A. Sabbaghi, B. Bidanda. Minimax Registration for Point Clouds Alignment.

Refereed Book Chapters

2. **Z. Geng**, B. Bidanda. Current Status and Applications of Additive Manufacturing for Dental Applications. Submitted to *The ASM Handbook, Vol. 24A, Additive Manufacturing in Biomedical Applications*.
1. **Z. Geng**, B. Bidanda (2020). Medical applications of additive manufacturing. In *Bio-Materials and Prototyping Applications in Medicine*. Springer, Cham.

Refereed Conference Proceedings

6. **Z. Geng**, B. Bidanda (2021). Metrological Analysis for Reverse Engineering System via Volumetric Data Analysis, *FAIM 2020 - 30th International Conference on Flexible Automation and Intelligent Manufacturing*, Athens, Greece.

5. **Z. Geng**, B. Bidanda (2019). Volumetric Data Analysis: Inspection and Experimental Design for Additive Manufacturing, *ASPE 34th Annual Meeting*, Pittsburgh, PA.
4. B. Bidanda, **Z. Geng** (2017). Modeling Techniques in Reverse Engineering, *24th International Conference on Production Research*, Poznan, Poland.
3. R. Bidanda, J. Winakor, **Z. Geng**, N. Vidic (2017). A Review of Optimization Models for Boarding a Commercial Airplane, *24th International Conference on Production Research*, Poznan, Poland.
2. B. Bidanda, **Z. Geng** (2016). Emerging Trends in Reverse Engineering, *Proceedings of the 2nd Conference on Progress in Additive Manufacturing*, Singapore, Singapore.
1. **Z. Geng**, J. Haight, W. Schwaderer (2016) Current Research - Safety & Health management System Performance Measurement, *The ASSE Safety 2016 Professional Development Conference & Exposition 2016*, Atlanta, GA.

CONFERENCE PRESENTATIONS

Invited Talks

3. **Z. Geng**, B. Bidanda. Automated Metrology Planning For 3d Scanning Of A Freeform Design Using Bayesian Optimization. In *2021 INFORMS Annual Meeting*, Anaheim, CA, October 2021.
2. **Z. Geng**. Volumetric Data Analysis for Reverse Engineering and Additive Manufacturing: A Framework for Geometric Metrological Analysis. *The University of Texas Rio Grande Valley*, Edinburg (Virtual), TX, Februrary 2021.
1. **Z. Geng**. Volumetric Data Analysis for Reverse Engineering and Additive Manufacturing: A Framework for Geometric Metrological Analysis. *University of Michigan-Dearborn*, Dearborn, MI, Februrary 2020.

Contributed Talks

10. **Z. Geng**, B. Bidanda. Geometric Metrology for Additive Manufacturing. In *STM International Conference on Additive Manufacturing (ASTM ICAM 2021)*, Anaheim, CA, November 2021.
9. **Z. Geng**, B. Bidanda. The Dual Functionality of Reverse Engineering for Additive Manufacturing. In *STM International Conference on Additive Manufacturing (ASTM ICAM 2021)*, Anaheim, CA, November 2021.
8. **Z. Geng**, B. Bidanda. Metrological Analysis for Reverse Engineering System via Volumetric Data Analysis. In *FAIM 2021 - 30th International Conference on Flexible Automation and Intelligent Manufacturing*, Athens, Greece, June 2021.
7. **Z. Geng**, B. Bidanda. Designed Experiments on Geometric Accuracy of Additive Manufacturing Processes. In *Institute of Industrial & Systems Engineers (IISE) Annual Conference & Expo 2020*, Virtual, May 2020.
6. **Z. Geng**, B. Bidanda. Freeform Tolerance Specification and Metrological Analysis of Reverse Engineered Models. In *FACAM 2020 Workshop*, Los Angeles, CA, February 2020.
5. **Z. Geng**, B. Bidanda. Reverse Engineering System: Tolerance Estimation and Analysis for Remanufacturing. In *2019 INFORMS Annual Meeting*, Seattle, WA, October 2019.
4. **Z. Geng**, B. Bidanda. Volumetric Data Analysis for Inspection of 3D Printed Parts. In *25th*

International Conference on Production Research, Chicago, IL, August 2019.

3. **Z. Geng**, B. Bidanda. Reverse Engineering for Small Batch Remanufacturing. In *Institute of Industrial & Systems Engineers (IISE) Annual Conference & Expo 2019*, Orlando, FL, May 2019.
2. B. Bidanda, **Z. Geng**. Modeling Techniques in Reverse Engineering. In *24th International Conference on Production Research, Poznan, Poland*, August 2017.
1. R. Bidanda, **Z. Geng**. Emerging Trends in Reverse Engineering. In *24th International Conference on Production Research*, Poznan, Poland, August 2017.

Contributed Posters

2. **Z. Geng**, B. Bidanda. Volumetric Data Analysis for Inspection of 3D Printed Parts. In *25th International Conference on Production Research*, Chicago, IL, August 2019.
1. **Z. Geng**, B. Bidanda. Modeling Techniques in Reverse Engineering. In *24th International Conference on Production Research, Poznan, Poland*, August 2017.

MENTORING EXPERIENCE

Master Student Supervision

UTRGV

- Mauro Garcia (Presidential Research Fellowship by The University of Texas Rio Grande Valley)
- William Noonan

TEACHING EXPERIENCE

The University of Texas Rio Grande Valley

Undergraduate Level

- MANE 4311, Quality Control (Instructor): 2021 Fall

Undergraduate Level

- DMEI 4303, Defense Manufacturing Seminar (Instructor): 2021 Fall

University of Pittsburgh

Undergraduate Level

- ENGR 0020, Probability and Statistics for Engineers I (Instructor): 2021 Spring, 2021 Fall, 2018 Fall, Spring
- IE 1082, Probabilistic Methods in Operations Research (TA): 2020 Summer
- ENGR 0020, Probability and Statistics for Engineers I (TA): 2016 Spring

Graudate Level

- IE 2007, Statistics and Data Analysis (TA): 2020 Spring
- IE 2062, Data Mining (TA): 2021 Spring
- IE 1089/2089, Additive Manufacturing (TA): 2018 Summer

AWARDS AND HONORS

Summer 2021 Degree Completion Fellowships for PhD Students (University of Pittsburgh), 2021.

Outstanding Teaching Assistant Award (Swanson School of Engineering), 2019.

Invitee, IFPR Doctoral Workshop, Poznan, Poland, August 2017.

ACADEMIC SERVICES

Invited reviewer for *Virtual and Physical Prototyping*, *International Journal of Production Research*.

Invited reviewer for *IEEE International Conference on Automation Science and Engineering 2021*, *IEEE International Symposium on Industrial Electronics 2021*, *SME NAMRC 48*, *International Conference on Production Research 2019*, *International Conference on Production Research 2017*.

Chair, Auctions and Remanufacturing session, 2019 INFORMS Annual Meeting, Seattle, WA, October 2019.

Undergraduate Student Research Mentor (2017 Summer) of Ashley Dacosta (Pitt EXCEL, Undergrad Diversity Program), co-advised with Dr. Joel M. Haight on data analysis of safety management program

Course Mentor, ENGR 0020, 2019 Fall.

Secretary, INFORMS Student Chapter, 2017.

Member of *IISE, INFORMS, ASA, ASQ*.