Xianping DU

Room B428, Haiqing Bulding 3, 2 Daxue Road, Zhuhai, Guangdong, China

Link: https://www.linkedin.com/in/xianping-du-510175116/

https://scholar.google.com/citations?user=EeHUTIMAAAAJ&hl=en

Cell: (+86) 13021510872 E-mail: xianping.du@gmail.com

SHORT BIOGRAPHY

- Interested in **Design automation, uncertainty quantification, and offshore wind turbine control co-design**
- Published **30 peer-reviewed papers** and **3 patents**
- Serving as the reviewer for SAMO, etc., well-known international journals and conferences

WORK EXPERIENCE

- **2020 FEB- Now**

  Postdoctoral associate, Rutgers University, NJ, US (Supervisors: **Prof. Onur Bilgen and Prof. Laurent Burlion**)
  - Model development and validation, reduced order modeling and control co-design;
- **2019 JUN- 2019 AUG**

  Research assistant, University of Connecticut, CT, US (Supervisor: **Prof. Hongyi Xu**)
  - Worked on the uncertainty quantification and engineering design
- **2016 JAN-2019 DEC**

  Research assistant, Embry-Riddle Aeronautical University, FL, US (Supervisor: **Prof. Feng Zhu**)
  - Develop a data mining methodology for complex system design, sUAV falling and electric vehicle safety
- **2016 JAN-2019 DEC**

  Teaching assistant ~ Embry-Riddle Aeronautical University, FL, US
  - Grade the homework and quiz of Engineering Material class and give tutorials on the FE simulations
- **2012 OCT-2013 NOV**

  Research assistant, Hunan University, Hunan, CN (Supervisor: **Prof. Libo Cao**)
  - Assist experiments on vehicle crash and traffic injury prevention

EDUCATION

- 2016 JAN-2019 DEC (Advisor: **Prof. Feng Zhu**)

  Ph.D. in Mechanical Engineering, Embry-Riddle Aeronautical University, Daytona Beach, US
- 2012 SEP- 2015 APR (Advisor: **Prof. Libo Cao**)

  M.S. in Mechanical Engineering, Hunan University, Hunan, CN
- 2008 SEP-2012 JUN

  B.S. in Vehicle Engineering, Shandong University of Technology, Shandong, CN

PROJECTS INVOLVED

- **2023**

  数据驱动的浮式风机结构稳定性识别与协同控制机理研究 ***(NSFC funding)***

  - To investigate the coupling between structural design and optimal dynamic control
  - To study the mechanism of structural instability under multi-physics coupling

- **2020 FEB-Now**

  A software framework for the control co-design of floating offshore wind turbine ***(US DoE ARPA-E grant)***

  - To develop a multidisciplinary and modularized design software framework
  - To construct a high-fidelity structural module
  - To couple modules on different physical disciplines
  - To implement control co-design based on hybrid-fidelity models

- **2016 JAN-2019 DEC**

  A data mining methodology for whole vehicle crashworthiness design (Ph.D. dissertation)

  - Developed a data mining methodology for systematic design
  - Proposed a decision tree algorithm for uncertain data learning for engineering design
  - Implemented method on the whole system design

- **2019 JUL–2020 FEB**

  Study on battery failure mechanism and protection design (funded by ***Ford Motor****)*

  - Reproduced the dynamic behavior by FE model for the safety-related failure mechanism
  - Did experiments using the prismatic battery for protection design

- **2017 MAR-2018 DEC**

  Study on battery and electric vehicle safety design (Collaborated with ***MIT****)*

  - Conducted a variety of battery cell and modules experiment
  - Developed a battery modules FE model for designing countermeasures

- **2016 JAN-2017 JAN**

  *Small unmanned aerial vehicle (sUAV) ground collision evaluation and structural design (****FAA*** *funding)*

  - Developed two sUAV FE models and simulated the ground collision
  - Established a simplified male chest FE model for UAV impact severity evaluation

- **2012 SEP-2014 NOV**

  Development of multiple vehicle crash dummies (https://www.hnsaf.com/en/index.html*)*

  - Finished Q6 child dummy geometric design, components cast mold design, and material selection
  - Led P3 child dummy geometric design and components cast mold design
  - Developed the TNO 10 head, neck, and chest geometric models and designed their cast molds
  - Finished Hybrid III 50th male lower leg cast mold design; Chest modeling and case mold design

PUBLICATIONS

[1] **Du, Xianping**, Binhui Jiang, and Feng Zhu*. A new method for vehicle system safety design based on data mining with uncertainty modeling. Engineering Structures, 247 (2021): 113184.

[2] **Du, Xianping**, Hongyi Xu, and Feng Zhu*. "Understanding the effect of hyperparameter optimization on machine learning models for structure design problems." *Computer-aided design*, (2021), 103013.

[3] **Du, Xianping**, Hongyi Xu and Feng Zhu*. A data mining method for structure design with uncertainty in design variables. Computers & *Structures,* 244: 106457.

[4] **Du, Xianping**, and Feng Zhu*. A new data-driven design methodology for mechanical systems with high dimensional design variables. *Advances in Engineering Software,* 117 (2018): 18-28.

[5] **Du, Xianping**, and Feng Zhu*. A novel principal components analysis (PCA) method for energy absorbing structural design enhanced by data mining. *Advances in Engineering Software,* 127 (2019): 17-27

[6] **Du, Xianping**, Chao Sun, Yiang Zheng, Xiexing Feng, and Na Li*. Evaluation of vehicle vibration comfort using deep learning. *Measurement*, (2020),108634.

[7] **Du, Xianping**, and Binhui Jiang*, Gaunjun Zhang, Clifford Chou, and Zhonghao Bai. Study on the long bone failure behaviors under the impactor rigid-contact by experiment analysis and subject-specific simulation. *Journal of Biomechanical Engineering,* 143 (2021).

[8] **Du, Xianping**, Yufang Deng, Guanjun Zhang, Libo Cao, and Feng Zhu*. Conceptual design and evaluation of a novel bilateral pretension seatbelt: a computational study. *International Journal of Crashworthiness*, (2019):1-10.

[9] **Du, Xianping**, Alex Dori and Eduardo Divo, Victor Huayamave and Feng Zhu*. Modeling the motion of small unmanned aerial system (sUAS) due to ground collision. *Proceedings of the Institution of Mechanical Engineers, Part G: Journal of Aerospace Engineering,* 232.10 (2018): 1961-1970.

[10] **Du, Xianping**, Feng Zhu*, and Clifford C. Chou. A new data-driven design method for thin-walled vehicular structures under crash loading. *SAE International journal of transportation safety,* 5.2017-01-1463 (2017): 188-193.

[11] **Du, Xianping***, Laurent Burlion, and Onur Bilgen. Control Co-Design for Rotor Blades of Floating Offshore Wind Turbines. *IMECE* 2020

[12] **Du, Xianping***, Hongyi Xu, and Onur Bilgen. Generating Pseudo-Data to Enhance the Performance of Classification-Based Engineering Design: A Preliminary Investigation. *IMECE* 2020.

[13] Chen, Liang, **Xianping Du**, Bin Hu, and Frede Blaabjerg. "Drivetrain oscillation analysis of grid forming type-IV wind turbine." IEEE Transactions on Energy Conversion (2022).

[14] Zhu, Feng*, **Xianping Du**, Jianyin Lei, and et al. Experimental study on the crushing behaviour of lithium-ion battery modules. *International Journal of Crashworthiness*, (2020) 1-10.

[15] Peng, Yi, **Xianping Du** and Lihua Huang et al. Optimizing bone cement stiffness for vertebroplasty through biomechanical effects analysis based on patient-specific three-dimensional finite element modeling. *Medical & biological engineering & computing* (2018): 1-14.

[16] Zhu, Feng*, Jianyin Lei and **Xianping Du** et al. Crushing Behavior of Vehicle Battery Pouch Cell and Module: A Combined Experimental and Theoretical Study. *SAE Int. J. Mater. Manf.* 11(4):341-348, 2018.

[17] Mo, Fuhao*, Li, Fan, Behr, Michel, Xiao, Zhi, Zhang, Guanjun, & **Du, Xianping**. A lower limb-pelvis finite element model with 3D active muscles. *Annals of biomedical engineering*, 2018, *46*(1), 86-96.

[18] **Du, Xianping,** Guanjun Zhang, Libo Cao* and Yuequn Hu. A study on the simulation analysis and injury criterion of Chinese lower leg impact. *Qiche Gongcheng/Automotive Engineering*, 38 (2016): 1324-1330.

[19] Cao, Libo*, **Xianping Du**, Guanjun Zhang, Yuequn Hu, and Kai Zhang. Development and Validation of the 50th Percentile Chinese Male Lower Leg FE Model. *Qiche Gongcheng*, 37 (2015): 1291-1297+1319.

[20] Cao, Libo*, **Xianping Du**, Guanjun Zhang, and Kai Zhang. Reverse of Geometry and Material Parameter for the Child Crash Dummy. *Mechanical science and technology for aerospace engineering*, 11 (2015): 1-5.

[21] **Du, Xianping**, Libo Cao*, Guanjun Zhang, and Kai Zhang. Progress in 3D Finite Element Modeling of Pedestrian Lower Limb Injury. *Chinese Journal of Automotive Engineering*, 4(2014), 235-244.

[22] Zhang, Guanjun, Longliang Wang, Yuequn Hu, **Xianping Du,** and Libo Cao. “A Study on the Validation Method of the 50th Percentile Chinese Thigh Finite Element Model Based on Optimization.” *Qiche Gongcheng*, 38(2016), 653-660.

[23] Zhang, Guanjun, Longliang Wang, Xiaopeng Deng, **Xianping Du,** and Fengjiao Guan. "Study on FE Modeling Method of the 50th Percentile Chinese Shank with Optimization Methods under Multi-Loading Condition." *Chinese Journal of Biomedical Engineering* 36, 2(2017): 195-204.

CONFERENCE PRESENTATIONS

[1] **"**基于不确定决策树算法的大型风机叶片结构稳定性识别." 2021+1 中国力学大会（CCTAM2021+1）, Nov. 6-8, 2022.

[2] "A control co-design framework for the floating offshore wind turbines: a preliminary demonstration." ICFDM2022, Changchun, China, Aug. 17-19, , 2022.

[3] **Keynote Speech**, "A machine learning method for vehicle crashworthiness design." USNCCM15, Jul. 28- Aug. 01, 2019, Austin.

[4] "Control Co-Design for Rotor Blades of Floating Offshore Wind Turbines." ASME IMECE, Nov. 16-19, 2020.

[5] **"**Generating Pseudo-Data to Enhance the Performance of Classification-Based Engineering Design: A Preliminary Investigation." ASME IMECE, Nov. 16-19, 2020.

[6] "A Data Mining Method for Vehicle Crashworthiness Design." The 3rd Xiangjiang River International Forum for Outstanding Overseas Young Scholars (Sub-Forum of Traffic& Transportation Engineering), May. 18-19, 2019, Changsha, China.

[7] "A new crashworthiness design method for complex vehicular structures using principal components analysis (PCA) and data mining." ASME IMECE, Nov. 9-15, 2018, Pittsburgh, PA.

[8] "Finite Element Modeling of a Lower Limb Based on the East Asian Body Characteristics for Pedestrian Protection." ICAME, Jun. 4-5, 2017, New York, NY.

PATENTS

[1] **Du, Xianping** et al. "Foldable power twister." CN201899810U.

[2] **Du, Xianping** et al. "Regulating system used for cooperatively regulating collision safety of seat cushion and backrest." CN104015639B.

[3] Huang, Jie and **Xianping Du** et al. "Automobile seat for actively and synergistically regulating cushion angle and backrest angle." CN104029617A.

HONORS AND AWARDS

- Silver medal of **patent competition** of Shandong province
- **National scholarship** for outstanding master student
- **Outstanding graduate** of Shandong province
- ***Yangfan* scholarship**, Shandong province for distinguished graduate

ACADEMIC SERVICES

- **Serving as the reviewer for:**

  Structural and Multidisciplinary Optimization; International Journal of Advanced Robotic Systems; Knowledge-Based systems; Vehicle System Dynamics; International Journal of Crashworthiness; International Journal of Transportation safety; Proc. IMechE, Part D: Journal of Automobile Engineering; SAE WCX 2017-2021; ASME IDETC 2019; ASME IMECE 2018-2021;

- **Serving as the host for a session of 'CCTAM2021+1'**