



Ping He

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Education

- Ph.D. *Engineering Thermophysics, Chinese Academy of Sciences, 2012*
- B. S. *Thermal Energy and Power Engineering, Sichuan University, 2007*

Academic Appointments

- Iowa State University (2020-present)**
 - Assistant Professor, August, 2020 – present
- University of Michigan, Ann Arbor (2016-2020)**
 - Assistant Research Scientist, May, 2018 – August, 2020
 - Postdoctoral Research Fellow, June, 2016 – May, 2018
- North Carolina State University (2013-2016)**
 - Postdoctoral Research Scholar, March, 2013 – June, 2016
- Duke University (2012-2013)**
 - Visiting Scholar, September, 2012 – March, 2013
- Chinese Academy of Sciences (2007-2012)**
 - Research Assistant, September, 2007 – July, 2012

Awards and Honors

Teaching

Research

Interest Areas:

- Multidisciplinary Design Optimization (MDO):** ▪ Modular high-fidelity MDO framework development; ▪ Effective adjoint algorithm development; ▪ Aero-thermal-structural optimization for aircraft and turbomachinery.
- Computational Fluid Dynamics (CFD):** ▪ Exploring efficient unsteady flow simulation algorithms; ▪ DNS and LES of small-scale turbulence; ▪ Massively parallel computing for CFD.

Selected Publications

(of 22 pubs. including 14 journals and 8 conf. proceedings)

1. **He, P.**, Mader, C.A., Martins, J.R.R.A., Maki, K.J. (2020). “DAFoam: An open source adjoint framework for multidisciplinary design optimization with OpenFOAM”. *AIAA Journal*, 58, pp. 1304-1319.
2. **He, P.**, Luder, A.J., Mader, C.A., Martins, J.R.R.A., Maki, K.J. (2020). “A time-spectral adjoint approach for aerodynamic shape optimization under periodic wakes”. In: AIAA Scitech Forum, AIAA-2020-2114.
3. Du, X.S., **He, P.**, Martins, J.R.R.A. (2020). “A B-spline-based generative adversarial network model for fast interactive airfoil aerodynamic optimization”. In: AIAA Scitech Forum, AIAA-2020-2128.
4. **He, P.**, Mader, C.A., Martins, J.R.R.A., Maki, K.J. (2019). “Aerothermal optimization of a ribbed U bend cooling channel using the adjoint method”. *International Journal of Heat and Mass Transfer*, 140, pp. 152-172.
5. Kenway, G.K.W., Mader, C.A., **He, P.**, Martins, J.R.R.A. (2019). “Effective adjoint approaches for computational fluid dynamics”. *Progress in Aerospace Sciences*, 110, p. 100542.
6. **He, P.**, Filip, G.P., Maki, K.J., Martins, J.R.R.A. (2019). “Design optimization for self-propulsion of a bulk carrier hull using a discrete adjoint method”. *Computers & Fluids*, 192, p. 104259.
7. **He, P.**, Mader, C.A., Martins, J.R.R.A., Maki, K.J. (2019). “An object-oriented framework for rapid discrete adjoint development using OpenFOAM”. In: AIAA Scitech Forum, AIAA-2019-1210.
8. **He, P.**, Mader, C.A., Martins, J.R.R.A., Maki, K.J. (2018). “An aerodynamic design optimization framework using a discrete adjoint approach with OpenFOAM”. *Computers & Fluids*, 168, pp. 285-303.
9. **He, P.**, Mader, C.A., Martins, J.R.R.A., Maki, K.J. (2018). “Aerothermal optimization of internal cooling passages using the adjoint method”. In: 2018 Joint Thermophysics and Heat Transfer Conference, AIAA Aviation, AIAA-2018-4080.
10. **He, P.**, Basu, S. (2016). “Extending a surface-layer C 2 n model for strongly stratified conditions utilizing a numerically-generated turbulence dataset”. *Optics Express*, 24, pp. 9574-9582.
11. **He, P.** (2016). “A high order finite difference solver for massively parallel simulations of stably stratified turbulent channel flows”. *Computers & Fluids*, 127, pp. 161-173.
12. **He, P.**, Basu, S. (2015). “Development of similarity relationships for energy dissipation rate and temperature structure parameter in stably stratified flows: a direct numerical simulation approach”. *Environmental Fluid Mechanics*, 16, pp. 373-399.
13. **He, P.**, Sun, Z.G., Guo, B.T., Tan, C.Q. (2013). “Aerothermal investigation of backface clearance flow in deeply scalloped radial turbines”. *Journal of Turbomachinery*, 135, p. 021002.
14. **He, P.**, Sun, Z.G., Zhang, H.L., Chen, H.S., Tan, C.Q. (2012). “Investigation of clearance flows in deeply scalloped radial turbines”. *Proc. IMechE., Part A: Journal of Power and Energy*, 226, pp. 951-962.
15. **He, P.**, Sun, Z.G., Chen, H.S., Tan, C.Q. (2012). “Investigation of backface cavity sealing flow in deeply scalloped radial turbines”. *Proc. IMechE., Part A: Journal of Power and Energy*, 226, pp. 751-763.

Thesis Advisor/Co-advisor and Postgraduate-Scholar Sponsor

Professional and Outreach Activities