QINXIAN (CHELSEA) HE

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Citizenship: United States

EDUCATION

Massachusetts Institute of Technology Cambridge, MA GPA: 4.8/5.0

Ph.D. Aeronautics and Astronautics June 2014 (Expected)

Thesis: A Stochastic Process Model for Uncertainty Quantification in the Design of Complex Systems

Advisor: Karen E. Willcox

S.M. Aeronautics and Astronautics June 2010

Thesis: Development of an Income-Based Hedonic Noise Monetization Model for the Assessment of Aviation-Related Noise Impacts

Advisor: Ian A. Waitz

Duke University Pratt School of Engineering Durham, NC *Magna cum laude*, GPA: 3.86/4.0

B.S.E. Mechanical Engineering with Departmental Distinction May 2008

B.S.E. Biomedical Engineering May 2008

RESEARCH EXPERIENCE

Aerospace Computation Design Laboratory MIT June 2010 – Present

Developing methods for uncertainty quantification and sensitivity analysis in complex system design, including strategies for complexity estimation and resource allocation.

Laboratory for Aviation and the Environment MIT Sep 2008 – June 2010

Created a global model for assessing the monetary impacts of aviation noise to inform policy decision-making. Performed model testing, uncertainty assessment, and integration.

Acoustics and Noise Reduction Laboratory Duke University Jan 2007 – Aug 2008

Developed innovative passive noise reduction methods for aircraft interiors using lightweight flexible panels. Built computational models to simulate the behavior of multi-panel systems.

Orthopaedic Bioengineering Laboratory Duke University June 2005 – Sep 2006

Studied the morphology of mammalian articular cartilage in an evolutionary context.

TEACHING EXPERIENCE

16.003/16.004 Unified Engineering MIT Spring 2013

Laboratory Teaching Assistant for sophomore-level course in AeroAstro integrating Thermodynamics, Fluid Mechanics, Materials & Structures, and Signals & Systems. Instructed 60 students in various projects, including design of a remote-controlled aircraft, wind tunnel testing, and circuit building, culminating in the annual Unified Engineering Flight Competition.

Hands-On Aerospace MIT IAP 2012 & IAP 2013

Co-developed and co-instructed week-long non-credit course introducing freshman and sophomore students to a variety of topics in AeroAstro through lectures, hands-on activities, and laboratory tours. Activities have included building a miniature wind tunnel for streamline visualization, programming target-tracking robots, and designing lightweight gliders to optimize aerodynamic performance.

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Academic Honors

- MIT Graduate Women of Excellence Honoree 2013
- Zonta International Amelia Earhart Fellowship 2012 – 2013
- National Science Foundation Graduate Research Fellowship 2009 – 2012
- Federal Aviation Administration Centers of Excellence Outstanding Student of the Year 2010
- American Society of Mechanical Engineers John and Elsa Gracik Scholarship 2007 – 2008
- Tau Beta Pi Engineering Honor Society

Skills and Interests

- **Technical Areas:** Systems engineering, uncertainty quantification and risk mitigation, probabilistic sensitivity analysis, aviation environmental impacts, engineering program management.
- **Computer Literacy:** Extensive knowledge of MATLAB. Familiarity with Mathematica, SolidWorks, ArcGIS, and Python.
- **Language Proficiency:** English (native), Shanghai dialect (fluent), Mandarin (advanced: speaking; basic: reading, writing), French (basic).

Relevant Coursework

- **Aircraft Systems Engineering** (major concentration): Aerodynamics, Multidisciplinary System Design Optimization, Air Transportation Systems Architecting, Mechanics of Solid Materials, Human Factors Engineering.
- **Aerospace Computational Engineering** (minor concentration): Computational Science and Engineering, Introduction to Numerical Methods, Optimization Methods, Applied Probability.

Leadership Experience

Sidney-Pacific Graduate Community MIT

- Board of Trustees 2011 – Present
- Executive Council, Chair of the Halls 2010 – 2011
- MIT Alumni Association Great Dome Award for distinguished service to the Institute 2013
- William L. Stewart, Jr. Award for outstanding contributions to student life at MIT 2011

Women's Graduate Association of Aeronautics and Astronautics MIT

- President 2011 – 2012
- Vickie Kerrebrock Award for significant contributions to building a sense of community in the Department of Aeronautics and Astronautics 2012

Graduate Association of Aeronautics and Astronautics MIT

- Co-President 2008 – 2009
- Vickie Kerrebrock Award for significant contributions to building a sense of community in the Department of Aeronautics and Astronautics 2009

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PUBLICATIONS

- **He, Q.**, Allaire, D., Deyst, J., and Willcox, K. A Bayesian Framework for Uncertainty Quantification in the Design of Complex Systems. *12th AIAA ATIO/14th AIAA/ISSMO MAO Conference*, September 17-19, 2012, Indianapolis, IN.
- Allaire, D., **He, Q.**, Deyst, J., and Willcox, K. An Information-Theoretic Metric of System Complexity with Application to Engineering System Design. *Journal of Mechanical Design*, 134(10), 2012, pp. 100906.
- **He, Q.**, Wollersheim, C., Locke, M., and Waitz, I.A. Estimation of the Global Impact of Aviation-Related Noise Using an Income-Based Approach. *Transport Policy*, to appear.
- Mahashabde, A., Wolfe, P., Ashok, A., Dorbian, C., **He, Q.**, Fan, A., Lukachko, S., Mozdzanowska, A., Wollersheim, C., Barrett, S.R.H., Locke, M., and Waitz, I.A. Assessing the Environmental Impacts of Aircraft Noise and Emissions. *Progress in Aerospace Sciences*, 47(1), 2011, pp. 15-52.
- Bliss, D.B., **He, Q.**, Franzoni, L., and Palas, C. Innovative Structural Acoustic Strategies to Reduce Sound Transmission Through Lightweight Flexible Structures. *157th Meeting of the Acoustical Society of America*, May 18-22, 2009, Portland, OR.
- **He, Q.**, Bliss, D.B., and Franzoni, L. Noise Reduction Strategies Using Multi-Element Flexible Structures. *ASME 2008 Noise Control and Acoustics Division Conference*, July 28-30, 2008, Dearborn, MI.