

# Kenton B Fillingim

Research & Development Staff, Oak Ridge National Laboratory

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## I. EDUCATION

**Georgia Institute of Technology**, Atlanta, GA

**Ph.D.** Mechanical Engineering, August 2021

**Cumulative GPA:** 3.78

*Thesis: Understanding the Development & Implementation of Heuristics & Biases in Design*

*Advisor: Dr. Katherine Fu*

**Georgia Institute of Technology**, Atlanta, GA

**M.S.** Mechanical Engineering, December 2018

**University of South Alabama**, Mobile, AL

**B.S.** Mechanical Engineering, May 2016

Undergraduate Research Advisor: Dr. Joseph Richardson

## II. RESEARCH EXPERIENCE

**Research Associate for Human Factors in Design and Manufacturing**,

Oak Ridge National Lab, Oak Ridge, TN

April 2023 – Present

**Postdoctoral Research Associate**, Oak Ridge National Lab, Oak Ridge, TN

September 2021 – March 2023

**Graduate Research Assistant**, Georgia Institute of Technology, Atlanta, GA

October 2016 – August 2021

## III. TEACHING EXPERIENCE

- *Tech to Teaching* Certificate, Georgia Tech, Center for Teaching and Learning May 2020
- Center for the Integration of Research, Teaching, and Learning (CIRTL) May 2020  
Associate Level Certificate, Georgia Institute of Technology
- Mechanical Engineering Graduate Teaching Practicum Feb – Mar 2020  
Graduate level engineering design course of 60 students. 75-minute lectures were given in modular design and product portfolio planning.
- Graduate “Designing Open Eng. Systems” Grader, Dr. Julie Linsey Jan – May 2018

## IV. PUBLICATIONS

**Archival Peer-Reviewed Journal Articles**

1. **Fillingim, Kenton B.**, and Katherine Fu. Framework for the Evolution of Heuristics in Advanced Manufacturing. *Journal of Mechanical Design* 145, no. 1 (2023): 011401.
2. **Fillingim, K. B.**, Shapiro, H. & Fu, K. Error Management Bias in Student Design Teams. *ASME Journal of Mechanical Design* 145, no. 4 (2023): 042302.

3. Feldhausen, T., Yelamanchi, B., Gomez, A., Du Plessis, A., Heinrich, L., Saleeby, K., **Fillingim, K.**, Post, B., Love, L., Cortes, P. and MacDonald, E., 2023. Embedding ceramic components in metal structures with hybrid directed energy deposition. *The International Journal of Advanced Manufacturing Technology*, 125(9-10), pp.4425-4433.
4. Feldhausen, T., Paramanathan, M., Heineman, J., Hassen, A., Heinrich, L., Kurfess, R., **Fillingim, K.**, Saleeby, K. and Post, B., 2023. Hybrid Manufacturing of Conformal Cooling Channels for Tooling. *Journal of Manufacturing and Materials Processing*, 7(2), p.74.
5. Schauer, A. M., **Fillingim, K. B.**, & Fu, K. (2022). Impact of Timing in the Design Process on Students' Application of Design for Additive Manufacturing Heuristics. *ASME Journal of Mechanical Design*, 144(6), 062301.
6. Schauer, A. M., **Fillingim, K. B.**, & Fu, K. (2022). Comparing the Effect of Virtual and In-Person Instruction on Students' Performance in a Design for Additive Manufacturing Learning Activity. *Advances in Engineering Education*.
7. Feldhausen, T., Kannan, R., Saleeby, K., **Fillingim, B.**, Kurfess, R., Nandwana, P., & Post, B. (2022). Hybrid Manufacturing Approaches for the Production and Repair of Industrial Tooling. *Oak Ridge National Lab*. Oak Ridge, TN.
8. **Fillingim, K. B.** "Understanding the Development and Implementation of Heuristics and Biases in Design." (2021).
9. Paige, M., **Fillingim, K. B.**, Murphy, A., Song, H., Reichling, C. J., & Fu, K. (2021). Examining the Effects of Mood and Intuition on Design Outcomes. *International Journal of Design Creativity and Innovation*. DOI: 10.1080/21650349.2021.1890228
10. **Fillingim, K. B.**, Shapiro, H., Reichling, C. J., Fu, K. (2021). The Effect of Physical Activity through Virtual Reality on Design Creativity. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing*. DOI: 10.1017/S0890060420000529
11. **Fillingim, K. B.**, Nwaeri, R. O., Borja, F., Fu, K., and Paredis, C. J. J. (2020). Design Heuristics: Extraction and Classification Methods With Jet Propulsion Laboratory's Architecture Team. *ASME Journal of Mechanical Design*. 142(8): 081101. <https://doi.org/10.1115/1.4044160>
12. **Fillingim, K. B.**, Shapiro, H., Fu, K., & Paredis, C. (2020). Process Heuristics: Extraction, Analysis, and Repository Considerations. *IEEE Systems Journal*.
13. **Fillingim, K. B.**, Nwaeri, R. O., Fu, K., Paredis, C. J., & Rosen, D. (2020). Examining the Effect of Additive Manufacturing Rule Presentation on Part Redesign Quality. *Journal of Engineering Design*.

#### Peer-Reviewed Conference Publications

1. Fillingim, Kenton Blane, and Thomas Feldhausen. "Operator 4.0 for Hybrid Manufacturing." *Proceedings of the Design Society 3* (2023): 2835-2844.
2. **Fillingim, K. B.**, Nwaeri, R. O., Borja, F., Fu, K., & Paredis, C. J. (2018, August). Design Heuristics: Analysis and Synthesis from Jet Propulsion Laboratory's Architecture Team. In *Proceedings of the ASME 2018 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*.
3. Lee, B., **Fillingim, K. B.**, Binder, W. R., Fu, K., & Paredis, C. J. (2017, August). Design Heuristics: A Conceptual Framework and Preliminary Method for Extraction. In *Proceedings of the ASME 2017 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*.

## V. PRESENTATIONS AND INVITED TALKS

- **Fillingim, K. B.** Human Factors towards the Industrialization of Hybrid Systems. *Workshop on Human Factors towards the Industrialization of Hybrid Systems*. Knoxville, TN, September 2023.
- **Fillingim, K. B.**, Feldhausen, T. Cognitive Workload and Design Knowledge Gaps in Hybrid Manufacturing. *ASME 2023 International Design Engineering and Technical Conferences*. Boston, MA, August 2023.
- **Fillingim, K. B.** Human-AI Collaboration in Operator 4.0. *2<sup>nd</sup> Workshop on Trends in Human-AI Teaming for Engineering and Design*. Boston, MA, August 2023.
- **Fillingim, K. B.**, Feldhausen, T. Operator 4.0 for Hybrid Manufacturing. *International Conference on Engineering Design*. Bordeaux, France, July 2023.
- **Fillingim, K. B.** Integrating Design Research into Hybrid Manufacturing Environments. *University of Wisconsin-Madison*. Madison, WI, March 2023.
- **Fillingim, K. B.**, Feldhausen, T., Kannan, R., Nandwana, P., Saleeby, K., Kurfess, R. Hybrid DED Process Parameter Development and Translation across Spot Size. *Solid Freeform Fabrication Symposium*. Austin, TX, July 2022.
- Feldhausen, T., Saleeby, K., **Fillingim, K. B.** Kurfess, R., Kannan, R., Nandwana, P., Post, B. Hybrid Manufacturing Approaches for the Production and Repair of Industrial Tooling. *Additive Manufacturing with Powder Metallurgy Conference*. Portland, OR, June 2022.
- **Fillingim, K. B.** Development of Hybrid Manufacturing Processes for Industrial Applications. *University of South Alabama*, Mobile, AL, February 2022.
- **Fillingim, K. B.**, Shapiro, H., Paredis, C. J., & Fu, K., Framework for the Evolution of Heuristics in Advanced Manufacturing. *ASME 2020 International Design Engineering Technical Conference*, Virtual Conference, August 2020.
- **Fillingim, K. B.**, Understanding the Development and Implementation of Heuristics and Biases in Design. *Design Research Symposium*. Georgia Institute of Technology, October 2019.
- **Fillingim, K. B.**, Nwaeri, R. O., Borja, F., Fu, K., & Paredis, C. J., Design Heuristics: Analysis and Synthesis from Jet Propulsion Laboratory's Architecture Team. *ASME 2018 International Design Engineering Technical Conference*, Quebec City, Quebec, August 2018.
- **Fillingim, K. B.**, Nwaeri, R. O., Borja, F., Fu, K., & Paredis, C. J., Understanding the Role of Design Heuristics in Complex Systems Design at Jet Propulsion Laboratory. *Jet Propulsion Laboratory's Innovation Foundry*, Pasadena, CA, November 2017.
- Lee, B., **Fillingim, K. B.**, Binder, W. R., Fu, K., & Paredis, C. J., Design Heuristics: A Conceptual Framework and Preliminary Method for Extraction. *ASME 2017 International Design Engineering Technical Conference*, Cleveland, OH, August 2017.

## VI. HONORS AND AWARDS

- George P. Burdell Fellowship, Georgia Institute of Technology, Summer – Fall 2020.
- Achievement Rewards for College Scientists (ARCS) Foundation Scholar, Fall 2020 – Spring 2021
- ARCS Foundation Scholar, Mr. and Mrs. Joseph Evans Award, Fall 2019 – Spring 2020
- National Science Foundation Summer School on Decision-Making in Systems Engineering and Design Scholarship, University of Southern California, 2018

- National Science Foundation Engineering and Systems Design Research Methods Summer School Scholarship, Clemson University, 2017
- Whiddon Honors Scholarship, University of South Alabama, Fall 2012 – Spring 2016
- University of South Alabama Presidential Scholarship, Fall 2012

## VII. PRESS AND MEDIA

- “Dr. Kate Fu and the EDRL do Research Study at the Jet Propulsion Laboratory” Published March 2020. <http://cstar.gatech.edu/dr-kate-fu-and-edrl-do-research-study-jet-propulsion-laboratory>
- “Additive Manufacturing of Multi-Functional/Graded Materials for Improved Tooling Performance.” <https://www.ornl.gov/technology/202205248>.

## VIII. COMMITTEES AND SOCIETIES

- American Society of Mechanical Engineers (2021-present)
- Society of Manufacturing Engineers (2023-present)

## IX. MENTORSHIP

### Undergraduate Students

Name	Year	Joint Publications	Degrees Earned
Felipe Borja	2017	2	B.S. Eng., Harvey Mudd (2019)
Hannah Shapiro	2018-20	3	B.S. Mech Eng., Georgia Tech (2020)
Erik Shuster	2019	0	B.S. Mech Eng., Georgia Tech (2020)
Anna Pavleszek	2021	0	B.S. Mech Eng., Georgia Tech (2023)
Sarah Dominguez	2021	0	B.S. Mech Eng., Georgia Tech (2022)
Karina LaRubbio	2023	0	B.S. Comp. Sci., U of Florida (Exp 2024)

### Graduate Students

Name	Year	Joint Publications	Degrees Earned
Anastasia Schauer	2019-23	2	M.S. Mech Eng., Georgia Tech (2021), PhD M.E., Georgia Tech (Exp 2024)
Richard Nwaeri	2017-19	3	M.S. Mech Eng., Georgia Tech (2019)
Lauren Heinrich	2022-23	2	PhD M.E., Georgia Tech (Exp 2024)
Callan Herberger	2023	0	PhD Eng., UTEP (Exp 2024)
Nisha Detchprohm	2020	0	M.S. Mech Eng., Georgia Tech (2021)

## X. PROFESSIONAL EXPERIENCE

### Georgia Tech Leadership Education and Development (LEAD)

Grand Challenges Facilitator

Atlanta, GA

Aug 2018 – December 2019

Facilitated design project progression within two undergraduate design teams. Project deliverables included design space exploration, problem statements, ideation, prototyping, testing, and developing business models.

**Hargrove Engineers + Constructors**  
*Mechanical Engineering Intern*

Mobile, AL  
May 2015 – Aug 2015

## **XI. SERVICE AND OUTREACH**

### **Journal and Conference Reviewer Assignments**

- Manufacturing Science and Engineering Conference (MSEC), Reviewer, 2022-23.
- ASME International Design Engineering & Technical Conferences (IDETC), Review Coordinator, 2021.
- IDETC, Reviewer, 2020-2022.
- International Conference on Engineering Design (ICED), Reviewer, 2022.
- Journal of Engineering Design, Reviewer, October 2020.
- Journal of Mechanical Design, Reviewer, 2022-23.
- Design Studies, Reviewer, 2023.

### **Volunteer Service and STEM Outreach**

- Design Theory and Methodology 30<sup>th</sup> Anniversary Dinner, IDETC, Quebec, August 2018.
- Georgia Tech ME student mental health ad hoc committee, December 2019 – Present.
- House of Genius Atlanta Panelist, September 2019.
  - House of Genius holds monthly sessions that provide collaborative, creative solutions to startups across the city encountering unique business challenges.
- Center for Puppetry Arts (Atlanta, GA), November 2019 – July 2021
  - Consultant for “Women of STEM Gameshow” content
  - Developed a one hour, space themed program introducing STEM in Title 1 schools