

## Grace Burleson, Ph.D.

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University of Colorado Boulder  
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**Mechanical Engineering**  
University of Colorado Boulder  
Engineering Center  
Office: ECOT 238

### EDUCATIONAL BACKGROUND

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2023	<b>Ph.D., Design Science</b> <i>Certification: Science, Technology, and Public Policy</i> <i>Certification: Diversity, Equity, and Inclusion</i>	University of Michigan
2018	<b>M.S., Mechanical Engineering &amp; Applied Anthropology (dual major)</b>	Oregon State University
2016	<b>B.S., Mechanical Engineering</b>	Oregon State University

### APPOINTMENT HISTORY

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1/2024 – Current	<b>Assistant Professor</b> , <i>Mechanical Engineering</i> , University of Colorado Boulder
9/2023 – 12/2023	<b>Visiting Assistant Professor</b> , <i>Mechanical Engineering</i> , University of Colorado Boulder
6/2019 – 8/2023	<b>Graduate Research Assistant</b> , <i>School of Integrated Systems &amp; Design, School of Information, and Center for Global Health Equity</i> , University of Michigan
9/2016 – 8/2018	<b>Graduate Research Assistant</b> , <i>Humanitarian Engineering</i> , Oregon State University

### AFFILIATIONS AND FELLOWSHIPS

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2024 – Present	<b>Faculty Fellow</b> , <i>Mortenson Center in Global Engineering &amp; Resilience</i> , University of Colorado Boulder
2023 – Present	<b>Affiliate</b> , <i>Engineering Education Doctoral Program</i> , University of Colorado Boulder
Fall 2022	<b>Research Fellowship</b> , <i>Convergent Aeronautics Solutions Project</i> , The National Aeronautics and Space Administration (NASA)
2021	<b>J. Reid and Polly Anderson Fellowship in Manufacturing</b> , <i>College of Engineering</i> , University of Michigan
2020 – 2021	<b>Engineering for Change Fellowship</b> : “ <i>Research Management Fellow</i> ,” American Society of Mechanical Engineers (ASME)
2019	<b>Engineering for Change Fellowship</b> : “ <i>Junior Program Management Fellow</i> ,” American Society of Mechanical Engineers (ASME)
2018	<b>Engineering for Change Fellowship</b> : “ <i>Water, Energy, &amp; Sanitation Management Fellow</i> ,” American Society of Mechanical Engineers (ASME)
2017 – 2018	<b>Evans Family Fellowship</b> , <i>Humanitarian Engineering</i> , Oregon State University
2017	<b>Engineering for Change Fellowship</b> : “ <i>Water Research Fellow</i> ,” American Society of Mechanical Engineers (ASME)

### HONORS AND AWARDS

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2023	<b>Best Paper Award</b> , International Conference on Engineering Design (ICED)
2023	<b>Best Paper Finalist</b> , Design in Engineering Education Division, American Society of Engineering Education (ASEE) Annual Conference
2022	<b>Papadopoulos Family Global Health Design Graduate Research Award</b> , University of Michigan
2022	<b>Leadership Award for Diversity, Equity, and Inclusion</b> , School of Integrative Systems and Design, University of Michigan
2022	<b>Rackham Graduate Student Research Grant</b> , University of Michigan
2021	<b>Harold and Vivian Shapiro Award</b> , University of Michigan
2019	<b>Rackham Graduate Student Research Grant</b> , University of Michigan
2017	<b>E-Teams Stage 1 Award</b> , VentureWell

2016  
2011 – 2016

**Undergraduate Research Fellowship & Honors Scholar**, Oregon State University  
**Diversity Achievement Scholarship**, Oregon State University

## SCHOLARLY PUBLICATIONS

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[Google Scholar Profile](#) | <https://orcid.org/0000-0002-3396-3183>

### Peer-Reviewed Journal Publications

\*indicates G Burleson was the corresponding author

1. **Burleson, G.\***, Lajoie, J., Mabey, C., Sours, P., Ventrella, J., Peiffer, E., Stine, E., et al. (2023). Advancing Sustainable Development: Emerging Factors and Futures for the Engineering Field. *Sustainability*, 15(10), 7869. [Link](#).
2. Sánchez-Parkinson, L., Moses, N., **Burleson, G.**, Daly, S., Holloway, J., Conger, A., Sienko, K., Meadows, L. (2023). Intercultural experiences of engineering students during immersive design projects. *International Journal of Service Learning in Engineering, Humanitarian Engineering and Social Entrepreneurship*. Vol. 18:1, pp. 35-51. [Link](#).
3. Rodriguez, N. M., **Burleson, G.**, Linnes, J. C., Sienko, K. (2023). Thinking beyond the device: An overview of human- and equity-centered approaches for improved health technology design. *Annual Review of Biomedical Engineering*, 25. [Link](#).
4. **Burleson, G.**, Toyama, K., Sienko, K. (2023). Incorporating contextual factors into engineering design processes: An analysis of novice behavior. *Journal of Mechanical Design*. 145(2): 021401. [Link](#).
5. Rodriguez-Calero, I., Daly, S., **Burleson, G.**, Sienko, K. (2023). Prototyping strategies to engage stakeholders during front-end design: A study across three design domains. *Journal of Mechanical Design*. 145(4): 041413. [Link](#).
6. Rodriguez-Calero, I., Daly, S., **Burleson, G.**, Coulentianos, M., Sienko, K., (2022). Using practitioner strategies to support engineering students' intentional use of prototypes for stakeholder engagement during front-end design. *International Journal of Engineering Education*. Vol. 38, No. 6, pp. 1923-1935. [Link](#).
7. **Burleson, G.**, Caplan, D., Mays, C., Navab-Daneshmand, T., Moses, N., Sharp, K., MacCarty, N. (2020). Computational modeling and empirical analysis of an institutional-sized biomass-powered drinking water pasteurization technology. *Energies*. Vol. 13:4 (936). [Link](#).
8. **Burleson, G.**, Tilt, B., Sharp, K., MacCarty, N. (2019). Reinventing boiling: A rapid ethnographic and engineering evaluation of a high-efficiency thermal water treatment technology in Uganda. *Energy Research and Social Science*. Vol. 52, p68-77. [Link](#).
9. **Burleson, G.**, Sharp, K., Ruder, B., Goodwin, B., Butcher, B. (2017). Soap-Making Process Improvement: Including Social, Cultural and Resource Constraints in the Engineering Design Process. *International Journal for Service Learning in Engineering*. Vol. 12:2, p81-102. [Link](#).

### Peer-Reviewed Book Chapters

1. **Burleson, G.**, Rojas, C., Holguin-Clover, M., Machado, M., Aranda, I. (2021). Engineering for Change Fellowship Program. In Cruz, C., Kleba, J., Alvear, C. (Eds.), *Engineering and Other Engaged Technical Practices - Volume 2: Initiatives of Professional Training* (pp. 469-499). Editora da Universidade Estadual da Paraíba. [Link](#).

### Peer-Reviewed Conference Proceedings (all include presentations and published proceedings)

1. **Burleson, G.**, Toyama, K., Sienko, K. (2023). Towards a Theoretical Framework for Using “Context” in Engineering Design Processes for Global Health Applications. *ASME International Design Engineering Technical Conference*. Boston, MA. Aug. 20-23, 2023.
2. Rieken, E., Bond, K., Best, R.M., **Burleson, G.**, Brubaker, E.R. (2023). A Spectrum of Stakeholder Perspective Taking in Early-Stage Design. *International Conference on Engineering Design*. Bordeaux, France. July 24-28, 2023.

\*Best Paper Award

3. **Burleson, G.**, Toyama, K., Sienko, K. (2023). Supporting Engineering Students' Incorporation of "Context" into Global Health Design Processes. *American Society of Engineering Education Conference Proceedings*. Baltimore, MD. Jun 25-28, 2023.  
\*Best Paper Finalist
4. Rieken, E., Brubaker, E.R., Best, R.M., Bond, K.H., **Burleson, G.**, Simpson, T. (2023). Approaching Complex Societal Problems Tied to Aviation. *American Institute of Aeronautics and Astronautics Aviation Forum*. San Diego, CA. June 12-16, 2023. [Link](#).
5. **Burleson, G.**, Machado, M., Aranda, I. (2021). 'Engineering for Global Development' in Academic Institutions: An Initial Review of Learning Opportunities Across Four Global Regions. *World Engineering Education Forum and Global Engineering Deans Council (WEEF/GEDC)*. Madrid, Spain. Nov. 15-19, 2021. [Link](#).
6. **Burleson, G.**, Herrera, S.V., Toyama, K., Sienko, K. (2021). Initial characterization of novice engineering designers' consideration of contextual factors. *2021 International Conference on Engineering Design (ICED)*. Gothenburg, Sweden. Aug. 16-20, 2021. [Link](#).
7. **Burleson, G.**, Sienko, K., Toyama, K. (2020). Incorporating Contextual Factors into a Design Process: An Analysis of Engineering for Global Development Literature. *ASME International Design Engineering Technical Conference Proceedings*. Virtual, Online. Aug. 16-19, 2020. [Link](#).
8. **Burleson, G.**, Austin-Breneman, J. (2020). Engineering for Global Development: Describing the Maturity of the Field Through a Systematic Literature Review. *ASME International Design Engineering Technical Conference Proceedings*. Virtual, Online. Aug. 16-19, 2020. [Link](#).
9. **Burleson, G.**, Toyama, K., Naseem, M. (2020). An Exploration of African-American Pregnant Women's Information-Seeking Behavior in Detroit. *International Conference on Information and Communication Technologies and Development (ICTD 2020)*. Virtual, June 17-20, 2020. [Link](#).
10. Maranga, I., **Burleson, G.**, Christen, R., Da Silva, I. (2019). Design and testing of a solar-powered bicycle in Nairobi, Kenya. *ASME International Design Engineering Technical Conference Proceedings*. Anaheim, CA, USA. Aug. 18-21, 2019. [Link](#).
11. **Burleson, G.**, Sharp, K. (2018). Comparative Study of Maintenance Planning and Failure Modes of Drinking Water Projects: Case Studies from Eastern Uganda. *2018 IEEE Global Humanitarian Technology Conference (GHTC)*. San Jose, CA. Oct. 18-21, 2018. [Link](#).
12. **Burleson, G.**, MacCarty, N., Sharp, K., Tilt, B. (2018). An interdisciplinary mixed-method approach to evaluating a novel water treatment technology in Eastern Uganda. *ASME International Design Engineering Technical Conference Proceedings*. Quebec City, Canada. Aug. 26-29, 2018. [Link](#).
13. MacCarty, N., **Burleson, G.**, et al. (2017). Design and testing of a high-efficiency rapid throughput community-scale water pasteurization system. *ASME International Design Engineering Technical Conference Proceedings*. Cleveland, OH. Aug. 6-9, 2017. [Link](#).
14. Sharp, K., **Burleson, G.**, Ruder, B., Goodwin, B., Butcher, B. (2016). Assisting economic opportunity for women through appropriate engineering design of a soap-making process in Uganda. *ASME International Design Engineering Technical Conference Proceedings*. Charlotte, NC. Aug. 21-24, 2016. [Link](#).

#### **Additional Peer-Reviewed Conference Presentations (no proceedings)**

##### Podium Presentations:

1. **Burleson, G.**, Toyama, K., Sienko, K., (2023). Using Practitioner Case Studies to Support Engineering Students' Intentional Incorporation of Contextual Factors During Global Health Design. *Mudd Design Workshop*. Claremont, CA. June 8-10, 2023.
2. Cantilina, K., **Burleson, G.**, (2021). Latent Techno-Aggressions: How Technology Perpetuates Racial Injustices in the United States. *UM-Wide Sustainability & Environment Conference*. Virtual, Feb. 22, 2021.
3. **Burleson, G.**, et al. (2020). Engineering for the SDGs: Insights from the E4C 2020 Fellowship. *ASME's Impact.Engineered*. New York, NY, Dec. 11, 2020.
4. **Burleson, G.**, Aranda, I., Machado, M. (2019). The E4C Library: A Tool to Analyze Essential Technologies for Reaching the SDGs. *Sustainability & Development Conf*. Ann Arbor, MI. Oct. 11-15, 2019.

5. **Burleson, G.**, Tilt, B., Sharp, K., MacCarty, N. (2019). Incorporating Rapid Ethnography into Engineering Design: A Field Study of a Water Treatment System in Uganda. *Sustainability & Development Conference*. Ann Arbor, MI. Oct. 11-15, 2019.
6. Rojas, C., **Burleson, G.**, Machado, M. (2019). The Importance of an Enabling Environment for Pay-As-You-Go Solar Home Systems: A Case Study of Rural Panama. *Sustainability & Development Conference*. Ann Arbor, MI. Oct. 11-15, 2019.
7. **Burleson, G.**, et al. (2019). Benchmarking Tech4Good: Insights from the Field. *ASME's Impact.Engineered*. New York, NY, Oct. 9, 2019.
8. Machado, M., **Burleson, G.**, et al. (2018). Benchmarking Tech4Good: Insights from the Field. *ASME's Impact.Engineered*. New York, NY, Oct. 11, 2018.
9. Mays, C., **Burleson, G.**, Sharp, K., MacCarty, N., Navab-Daneshmand, T. (2018). Microbiological testing of a community-based, biomass-fueled water pasteurizer and procedures for cleaning household water transport containers. *Water and Health Conference*. University of North Carolina, Oct. 2018.
10. **Burleson, G.**, Sharp, K., MacCarty, N., Tilt, B., (2018). An Ethnographic and Experimental Engineering Approach to Evaluating a Biomass-Powered Water Treatment System. *Society of Applied Anthropology Annual Meeting*. Philadelphia, PA, Apr. 2018.

#### Poster Presentations:

1. **Burleson, G.**, Toyama, K., Sienko, K., (2022). Incorporating Contextual Factors into Engineering Design Processes. *U-M Center for Ergonomics Inaugural Research Symposium*. Ann Arbor, MI. Sept. 30, 2022.
2. **Burleson, G.**, Severson, R., Muduku, R. (2019). The Mbale Center for Innovation and Design: An Initiative in Eastern Uganda. *STEM V: Innovation & Appropriate Technology in Africa*. Ann Arbor, MI. Oct. 18-21, 2019.
3. **Burleson, G.**, Sharp, K., MacCarty, N. Tilt, B., (2018). An Ethnographic and Experimental Engineering Approach to Evaluating a Biomass-Powered Water Treatment System. *Oregon State Univ. College of Engineering Graduate Showcase*, Feb 2018.  
\*Second Place: Best Poster Award

#### **SEMINARS, WORKSHOPS, AND INVITED TALKS**

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10/2023	“Advancing Engineering Design Methods for Social and Environmental Outcomes,” American Association of Engineers of Indian Origin (AAEIO), <b>University of Colorado Boulder</b> (workshop)
1/2022	“Shaping the Future: Infusing DEI into Research,” <b>University of Michigan</b> (webinar panelist)
9/2021	“Engineering for Global Development: Past, Present, and Opportunities for the Future,” CIVILEN 5610.01: Sustainable WaSH Infrastructure for Developing Rural Communities, <b>Ohio State University</b> (guest lecture)
3/2021	“Designing for Impact in Global Health,” Center for Global Health Equity, <b>University of Michigan</b> (webinar panelist)
3/2021	“Advancing Sustainable Engineering: Building the Future Workforce,” <b>ASME Engineering for Change Webinar for World Engineering Day</b> (webinar panelist)
2/2021	“Courageous Conversations: Social Justice in Higher Education,” <b>Purdue University</b> (webinar panelist)
9/2020	“Engineering for Global Development: Past, Present, and Opportunities for the Future,” CIVILEN 5610.01: Sustainable WaSH Infrastructure for Developing Rural Communities, <b>Ohio State University</b> (guest lecture)
2/2020	“Prototyping & Material Selection,” BME450: Biomedical Engineering Capstone, <b>University of Michigan</b> (guest workshop)
11/2019	“Design ethnography,” NRE501: Technology and Community Sustainable Development, <b>University of Michigan</b> (guest workshop)

- 11/2019 “Data Synthesis and Needs Assessment,” BLUElab Member Training, **University of Michigan** (guest workshop)
- 11/2019 “Strategies for concept generation & design selection,” BLUElab Member Training, **University of Michigan** (guest workshop)
- 2/2019 “Engineering for Change,” IEEE Student Chapter, **Jomo Kenyatta University, Nairobi, Kenya** (guest lecture)
- 10/2017 “SDG6: Clean Water and Sanitation for All,” MGMT225: Introduction to Social Entrepreneurship, **University of Oregon** (guest lecture)

## RESEARCH GRANTS

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**As Principle Investigator (P.I.):** Total: \$41,800; Burleson share: \$41,800

2024 – Present **Institute of Electrical and Electronics Engineers, Inc. (IEEE)**, “Assessing Impact and Membership Journeys in Humanitarian Engineering Projects,” Total: \$41,800, Burleson share: \$41,800

## TEACHING

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Spring 2024 **GEEN 1400: Engineering Projects**, 31 students

## PROFESSIONAL SERVICE

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### Journal Reviewer

Journal of Mechanical Design; Biomedical Engineering Education Journal; International Journal of Engineering Education; Journal of Energy for Sustainable Development

### Conference Proceedings Reviewer

ASME International Design and Engineering Technical Conferences (IDETC): Design Automation Conference, Design Theory and Methodology Conference; ACM Conference on Computer-Supported Cooperative Work and Social Computing, ACM Computer and Human Interaction (CHI)

### Conference Session Chair

- 2024 Session Co-Chair & Reviewer Coordinator, **Special Session: Qualitative Research in Design**, Design Theory and Methodology Conference, ASME International Design and Engineering Technical Conferences (IDETC), Washington, D.C., Aug 2024
- 2024 Session Co-Chair & Reviewer Coordinator, **Engineering for Sustainable Development**, Design Automation Conference, ASME International Design and Engineering Technical Conferences (IDETC), Washington, D.C., Aug 2024