# Rohan Prabhu, Ph.D.

Assistant Professor - Department of Mechanical Engineering

Lafayette College

## CONTACT

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## APPOINTMENTS

**Lafayette College** (Items in maroon indicate work initiated/completed at Lafayette College)

Assistant Professor – Mechanical Engineering (Fall 2021 - Present)

Director – Knowledge and Individual Differences in Design (KIDD) Lab

### The Pennsylvania State University

Graduate Research Assistant – Made by Design Lab (Fall 2017 – Summer 2021)

Project: 'Making in the Maker Movement: An Investigation into the Impact of Additive Manufacturing on Student Creativity' funded by the NSF (Grant No. 1712234).

PI: Nicholas A. Meisel, Co-PIs: Timothy W. Simpson and Scarlett R. Miller, Collaborator: Stephanie Cutler.

Research Assistant – britelab (Summer 2017)

Project: 'Dynamic Haptic Robotic Training for Central Venous Catheter Insertions' funded by the NIH (#R01HL127316).

PI: Scarlett R. Miller, Co-PIs: Jason Z. Moore and David C. Han.

## EDUCATION

### The Pennsylvania State University, University Park, PA

PhD – Mechanical Engineering (2021)

Doctoral Minor – Psychology (2021)

Dissertation: Encouraging Creativity through Design for Additive Manufacturing: An Investigation in Engineering Design Education.

Committee: Nicholas A. Meisel (Chair), Timothy W. Simpson, Scarlett R. Miller, and Samuel T. Hunter; Collaborator: Stephanie L. Cutler.

Master of Science – Engineering Design (2018)

Thesis: Investigating the Effect of Design for Additive Manufacturing Education on Student Design Processes and Creativity.

Thesis Advisor: Nicholas A. Meisel; Collaborators: Timothy W. Simpson, Scarlett R. Miller, and Stephanie L. Cutler.

### National Institute of Technology Karnataka, Surathkal

Bachelor of Technology – Mechanical Engineering (2016)

Thesis: Static and Dynamic Finite Element Analysis of a Hip Joint Implant.

Advised by: Srikanth Bontha and Somasekhara Rao T.; Collaborator: Vamsi Krishna B.

## RESEARCH AND PUBLICATIONS

### Research Advising

#### Lafayette College

Primary Advising

- Evan Brown '26 (BS Integrative Engineering and Policy Studies, Fall 2022 – Present)
  Project: Reflection on Identity in Engineering Design
  CBL Ally Scholarship, Spring 2023 – Present
- Julia Greeley '25 (BS Civil Engineering, Fall 2021 – Fall 2022)
  Project: Creativity in Sustainable Design
  Claire Boothe Luce Research Scholarship, Summer 2022 – Fall 2022
- Emily Mastroly '25 (BA Engineering Studies & Environmental Studies, Fall 2021 – Fall 2022)
  Project: Creativity in Sustainable Design
  EXCEL Scholarship, Summer 2022 – Fall 2022
- Asher Ricci '25 (BS Mechanical Engineering, Spring 2022)
  Project: Design Representations in Design for Additive Manufacturing
- Jacob McCauley '24 (BS Mechanical Engineering, Spring 2023 – Present)
  Project: Material Properties of 3D Printed Plastics
  ME Thesis – 2024
- Jenna Herzog '24 (BS Chemical Engineering, Fall 2022 – Present)
  Project: Problem Framing in Sustainable Design Education
  Claire Boothe Luce Scholarship, Spring 2023 – Present
- Sam Milhaven '24 (BS Integrative Engineering – Robotics, Spring 2022 – Summer 2022)
  Project: Dynamic Feedback using Eye Tracking
  CBL Ally Scholarship, Summer 2022
- Rebekah Fodale '23 (BS Mechanical Engineering, Fall 2022 – Present)
  Project: Problem Framing in Sustainable Design Education
  Claire Boothe Luce Research Scholarship, Fall 2022 – Present
- Chikomborero Dhire '23 (BS Electrical and Computer Engineering, Fall 2022 – Present)
  Project: Live Streaming and Analysis of Eye Tracking Data
- Alexandra Powell '23 (BS Mechanical Engineering, Spring 2022 – Present)
  Project: Impact of Gender in Collaborative Ideation
  ME Thesis – 2023
- Jenny Chen '22 (BS Mechanical Engineering, Fall 2021 – Spring 2022)
  Project: Eye Tracking in Design Research
  Daniel O'Neil Senior Research Grant
- Madison Cass '22 (BS Neuroscience, Spring 2022)
  Project: Validating the Use of Eye Tracking for Measuring Cognitive Load in Design Research

Co-Advising

- Joy Herrera '24 (BS Civil Engineering, Fall 2022 - Present)
  Project: Design, Development, and Evaluation of a Landfill Model for Waste Management Education
  Awarded Scholarship for NCUR 2023

Thesis Committee Membership

- Eleanor Williams '22 (BS ME & Theater)
  Thesis Title: Interactive, Immersive, and Dynamic Scenic Design (Converted to Independent Studies)
- Benjamin Ryan '22 (BS ME)
  Thesis Title: Additively Manufactured Shape Memory Polymers

### The Pennsylvania State University

Primary Advising

- Antonio M. Buerkert (Undergraduate Researcher; Fall 2020)
  Project: Timing of Design for Additive Manufacturing Education
- Joseph T. Berthel (Undergraduate Researcher; Summer 2020)
  Project: Additively Manufactured Solutions for COVID-19
- Jordan S. Masia (Undergraduate Researcher; Summer 2020)
  Project: Additively Manufactured Solutions for COVID-19
- Rainmar L. Leguarda (Undergraduate Research Assistant; Fall 2018 – Spring 2020)
  Project: Concept selection in Design for Additive Manufacturing
  Funded by the Penn State Program for Undergraduate Research
- Misael Carlos Vera (Multi-Campus Research Experiences for Undergraduates; Summer 2018)
  Project: Qualitative analyses of design data in design for additive manufacturing tasks
  Funded by the Penn State Multi Campus Research Experience for Undergraduates

## Publications

*indicates undergraduate mentees, *italics* indicates role as corresponding/senior author, and +indicates equal contribution from authors.

### Journal Articles

Under Review/In Preparation

J25 *+Greeley, J., *+Mastroly, E., Alsager Alzayed, M., Starkey, E. M., Ritter, S. C., and ***Prabhu, R.***, 'Are Creative Solutions Also Environmentally Sustainable? (Title Redacted),' ***Journal of Cleaner Production***. [Under Review]

J24 Alsager Alzayed, M., Starkey, E. M., Ritter, S. C., and ***Prabhu, R.***, 'Exploring Relationships Between Students' Empathy, their Attitudes Towards Sustainability, and the Accuracy of Self-Evaluations (Title Redacted),' ***Design Science Journal – Special Issue on 'Design for Sustainable Development'***. [Under Review]

J23 ***Prabhu, R.***, Miller, S. R., Simpson, T. W., Meisel, N. A., 'Comparing the Effects of Lecture- and Module-Style Design for Additive Manufacturing Educational Interventions (Title Redacted),' ***International Journal of Design Creativity and Innovation***. [Major Revisions Under Review]

2023 and In Press

J22 Alsager Alzayed, M., Starkey, E. M., and ***Prabhu, R.*** (2023). "Exploring the Effects of Variations in the Timing of a Sustainable Design Educational Intervention," ***International Journal of Engineering Education – Special Issue on 'Mould Breaking Responses to the Unprecedented Challenges in Engineering Education'***. [In Press]

J21 ***Prabhu, R.***, Alsager Alzayed, M., and Starkey, E. M. (2023). "Not Good Enough? Exploring Relationships between Students? Trait Empathy, their Beliefs, Attitudes, and Intentions towards Sustainability, and the Self-Evaluated Sustainability of their Solutions," ***Journal of Mechanical Design***, *145(4)* – ***Special Issue on 'Emerging Technologies and Methods for Early-Stage Product Design and Development'***. [https://doi.org/10.1115/1.4055656]

2022

J20 ***Prabhu, R.***, Alsager Alzayed, M., and Starkey, E. M. (2022). "Feeling the Heat: Investigating the Influence of Novice Designers' Trait Empathy, and their Beliefs, Attitudes, and Intentions Towards Sustainability on their Identification of Problem Requirements," ***Research in Engineering Design Journal***. [https://doi.org/10.1007/s00163-022-00398-9]

J19 ***Prabhu, R.***, Simpson, T. W., Miller, S. R., Meisel, N. A. (2022). "Development and Validity Evidence Investigation of a Design for Additive Manufacturing Self-Efficacy Scale," ***Research in Engineering Design Journal***, *33(4)*. [https://doi.org/10.1007/s00163-022-00392-1]

J18 ***Prabhu, R.***, Miller, S. R., Simpson, T. W., Meisel, N. A. (2022). "Mastering Manufacturing: Exploring Effects of Engineering Designers' Prior Experience on Design for Additive Manufacturing Use," ***Journal of Engineering Design***, *33 (5)*. [https://doi.org/10.1080/09544828.2022.2075222]

J17 ***Prabhu, R.***, *Berthel, J. T., *Masia, J. S., Meisel, N. A., Simpson, T. W. (2022). "Rapid Response! Investigating the Effects of Problem Definition on the Characteristics of Additively Manufactured Solutions for COVID-19," ***Journal of Mechanical Design***, *144 (5)*. https://doi.org/10.1115/1.4052970

J16 ***Prabhu R.***, Starkey, E. M., Alsager Alzayed, M. (2022). "Exploring the Relationship Between Students' Trait Empathy, their Attitudes towards Sustainability, and their Reflections on a Workshop on Sustainable Design," ***International Journal of Engineering Education***, *38 (3)* – ***Special Issue on 'Ethics, Social Responsibility, and Sustainability in Engineering Education'***. https://www.ijee.ie/latestissues/Vol38-3/13_ijee4195.pdf

2021

J15 **Prabhu, R.**, Simpson, T. W., Miller, S. R., Cutler, S. L., Meisel, N. A. (2021). "Teaching Design for Additive Manufacturing: Formulating Educational Interventions that Encourage Design Creativity," ***3D Printing and Additive Manufacturing Journal***. https://doi.org/10.1089/3dp.2021.0087

J14 ***Prabhu, R.***, *Masia, J. S., *Berthel, J. T., Meisel, N. A., Simpson, T. W. (2021). "Maximizing Design Potential: Investigating the Effects of Utilizing Opportunistic and Restrictive Design for Additive Manufacturing in Rapid Response Solutions," ***Rapid Prototyping Journal***, *27 (6)*. https://doi.org/10.1108/RPJ-11-2020-0297

J13 ***Prabhu, R.***, *Masia, J. S., *Berthel, J. T., Meisel, N. A., Simpson, T. W. (2021). "Design and Manufacturability Data on Additively Manufactured Solutions for COVID-19," ***Data in Brief***, *36*. https://doi.org/10.1016/j.dib.2021.107012

J12 **Prabhu, R.**, *Leguarda, R. L., Miller, S. R., Simpson, T. W., Meisel, N. A. (2021). "Favoring Complexity: A Mixed Methods Exploration of Factors that Influence Concept Selection when Designing for Additive Manufacturing," ***ASME Journal of Mechanical Design***, *143 (10)*. https://doi.org/10.1115/1.4050303

J11 **Prabhu, R.**, Simpson, T. W., Miller, S. R., Meisel, N. A. (2021). "Fresh in My Mind! Investigating the Effects of the Order of Presenting Opportunistic and Restrictive Design for Additive Manufacturing Content on Students' Creativity," ***Journal of Engineering Design***, *32 (4)*. https://doi.org/10.1080/09544828.2021.1876843

2020

J10 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2020). "Built to Win? Exploring the Role of Competitive Environments on Students' Creativity in Design for Additive Manufacturing Tasks," ***Journal of Engineering Design***, *31 (11-12)*. https://doi.org/10.1080/09544828.2020.1851661

J9 **Prabhu, R.**, Bracken, J., Armstrong, C. B., Jablokow, K., Simpson, T. W., Meisel, N. A. (2020). "Additive Creativity: Investigating the Use of Design for Additive Manufacturing to Encourage Creativity in the Engineering Design Industry," ***International Journal of Design Creativity and Innovation***, *8 (4)*. **Awarded: Distinguished Paper Award 2020.** https://doi.org/10.1080/21650349.2020.1813633

J8 Bracken, J., Pomorski, T., Armstrong, C., **Prabhu, R.**, Simpson, T. W., Jablokow, K., Cleary, W., Meisel, N. A. (2020). "Design for Metal Powder Bed Fusion: The Geometry for Additive Part Selection (GAPS) Worksheet," ***Additive Manufacturing Journal***, *35*. https://doi.org/10.1016/j.addma.2020.101163

J7 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2020). "But Will It Build? Assessing Student Engineering Designers' Use of Design for Additive Manufacturing Considerations in Design Outcomes," ***ASME Journal of Mechanical Design***, *142 (9)*. https://doi.org/10.1115/1.4046071

J6 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2020). "Teaching Design Freedom: Understanding the Effects of Variations in Design for Additive Manufacturing Education on Students' Creativity," ***ASME Journal of Mechanical Design**, 142 (9)*. https://doi.org/10.1115/1.4046065

J5 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2020). "Complex Solutions for Complex Problems? Exploring the Effects of Design Task Choice on Student Use of Design for Additive Manufacturing and Creativity," ***ASME Journal of Mechanical Design**, 142 (3)*. (Invited for submission to the IDETC Special Issue) https://doi.org/10.1115/1.4045127

J4 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2020). "Exploring the Effects of Integrating Additive Manufacturing Education on Students' Engineering Design Process and its Outcomes," ***ASME Journal of Mechanical Design**, 142 (4)*. https://doi.org/10.1115/1.4044324

2019

J3 Chen, H., Sonntag, C. C., Pepley, D. F., **Prabhu, R.**, Han, D. C., Moore, J. Z., Miller, S. R. (2019). "Looks Can Be Deceiving: Gaze Pattern Differences during Placement of Central Lines," ***The American Journal of Surgery**, 217 (2)*. https://doi.org/10.1016/j.amjsurg.2018.11.007

J2 Chen, H., Yovanoff M. A., Pepley, D. F., **Prabhu, R.**, Sonntag, C. C., Han, D. C., Moore, J. Z., Miller, S. R. (2019). "Evaluating Surgical Resident Needle Insertion Skill Gains in Ventral Venous Catheterization Training," ***Journal of Surgical Research**, 233*. https://doi.org/10.1016/j.jss.2018.07.040

2018

J1 Pepley, D. F, Sonntag, C. C., **Prabhu, R.**, Yovanoff, M. A, Han, D. C., Miller, S. R., Moore, J. Z. (2018). "Building Ultrasound Phantoms with Modified Polyvinyl Chloride," ***Journal of the Society for Simulation in Healthcare**, 13 (3)*. https://doi.org/10.1097/SIH.0000000000000302

## Peer-reviewed Conference Papers

In Preparation and Under Review

C17 *Cass, M., and ***Prabhu, R.***, 'What does eye tracking tell us about cognitive load in design?' ***2023 International Conference on Engineering Design*** [Under Review]

C16 Alsager Alzayed, M., Starkey, E. M., Ritter, S. C., and ***Prabhu R.***, 'External Evaluation of Creativity and Environmental Sustainability in Sustainable Design Tasks,' ***ASME 2023 Design Automation Conference*** at the International Design Engineering Technical Conferences and Computers in Engineering Conference [In Preparation]

C15 *Fodale, R., *Herzog, J., Alsager Alzayed, M., Starkey, E. M., Ritter, S. C., and ***Prabhu R.***, 'Problem Framing and Student Designers' Perceptions in Sustainable Design,' ***ASME 2023 Design Theory and Methodology Conference*** at the International Design Engineering Technical Conferences and Computers in Engineering Conference [In Preparation]

C14 ***Prabhu, R.***, and *Cass, M., 'An exploration into the role of design representations in design for additive manufacturing,' ***ASME 2023 Design Automation Conference*** at the International Design Engineering Technical Conferences and Computers in Engineering Conference [In Preparation]

2022

C13 Alsager Alzayed, M., Starkey, E. M., and ***Prabhu, R.*** (2022). "Now is the Time! Exploring the Effects of the Timing of a Sustainable Design Educational Intervention," ***ASME 2022 Design Education Conference*** at the International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.

C12 Alsager Alzayed, M., Starkey, E. M., Ritter, S. C., and ***Prabhu, R.*** (2022). "Am I Right? Exploring Relationships Between Students' Empathy, their Attitudes Towards Sustainability, and the Accuracy of Self-Evaluations," ***ASME 2022 Design Automation Conference*** at the International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.

2021

C11 **Prabhu, R.**, Alsager Alzayed, M., Starkey, E. M. (2021). "Student Reflections on Sustainability and Empathy: The Outcomes of a Sustainability Workshop in First-year Design Courses," ***ASEE 2021 Annual Conference – Design in Engineering Education Division.*** https://peer.asee.org/37757

C10 ***Prabhu, R.***, Alsager Alzayed, M., Starkey, E. M. (2021). "Not Good Enough? Exploring Relationships Between Students' Empathy, their Attitudes Towards Sustainability, and the Self-Perceived Sustainability of their Solutions," ***ASME 2021 Design Education Conference*** *at the International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.* https://doi.org/10.1115/DETC2021-71960

C9 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2021). "Break It Down: Comparing the Effects of Lecture- and Module-Style Design for Additive Manufacturing Educational Interventions on Students' Learning and Creativity," ***ASME 2021 Design Education Conference*** *at the International Design Engineering Technical Conferences and Computers and Information in Engineering Conference*. **Shortlisted: Best Paper Award.** https://doi.org/10.1115/DETC2021-71702

C8 ***Prabhu, R.***, Alsager Alzayed, M., Starkey, E. M. (2021). "Feeling the Heat! Exploring the Relationship Between Students' Empathy, Attitudes Towards Sustainability, and their Identification of Problem Requirements," ***ASME 2021 Design Automation Conference*** *at the International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.* https://doi.org/10.1115/DETC2021-71993

C7 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2021). "Mastering Manufacturing: Exploring the Influence of Engineering Designers' Prior Experience When Using Design for Additive Manufacturing," ***ASME 2021 Design Automation Conference*** *at the International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.* https://doi.org/10.1115/DETC2021-71686

2020

C6 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2020). "Fresh in My Mind! Investigating the Effects of the Order of Presenting Opportunistic and Restrictive Design for Additive Manufacturing Content on Creativity," *Proceedings of the* ***ASME 2020 Design Education Conference*** *at the International Design Engineering Technical Conferences and Computers and Information in Engineering Conference,* Paper No. DETC2020-22449. **Shortlisted: Best Paper Award.** https://doi.org/10.1115/DETC2020-22449

C5 **Prabhu, R.**, *Leguarda, R. L., Miller, S. R., Simpson, T. W., Meisel, N. A. (2020). "Favoring Complexity: A Mixed Methods Exploration of Factors that Influence Concept Selection in Design for Additive Manufacturing," *Proceedings of the* ***ASME 2020 Design Automation Conference*** *at the International Design Engineering Technical Conferences and Computers and Information in Engineering Conference,* Paper No. DETC2020- 22447. https://doi.org/10.1115/DETC2020-22447

2019

C4 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2019). "Complex Solutions for Complex Problems? Exploring the Effects of Task Complexity on Student Use of Design for Additive Manufacturing and Creativity," *Proceedings of the* ***ASME 2019 Design Education Conference*** *at the International Design Engineering Technical Conferences and Computers and Information in Engineering Conference*, Paper No. DETC2019-97474. **Awarded: Best Paper Award.** https://doi.org/10.1115/DETC2019-97474

C3 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2019). "But Will It Print? Assessing Student Use of Design for Additive Manufacturing and Exploring Its Effect on Design Performance," *Proceedings of the* ***ASME 2019 Design Automation Conference*** *at the International Design Engineering Technical Conferences and Computers and Information in Engineering Conference,* Paper No. DETC2019-97478. https://doi.org/10.1115/DETC2019-97478

2018

C2 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2018). "Teaching Design Freedom: Exploring the Effects of Design for Additive Manufacturing Education on Components of Creativity," *Proceedings of the* ***ASME 2018 Design Education Conference*** *at the International Design Engineering Technical Conferences*

*and Computers and Information in Engineering Conference,* Paper No. DETC2018-85938. https://doi.org/10.1115/DETC2018-85938

C1 **Prabhu, R.**, Miller, S. R., Simpson, T. W., Meisel, N. A. (2018). "The Earlier the Better? Investigating the Importance of Timing on Effectiveness of Design for Additive Manufacturing Education," *Proceedings of the **ASME 2018 Design Automation Conference** at the International Design Engineering Technical Conferences and Computers and Information in Engineering Conference,* Paper No. DETC2018-85953. https://doi.org/10.1115/DETC2018-85953

### Peer-reviewed Conference Abstracts

3 Chen, H, Sonntag C. C., **Prabhu, R.**, Pepley, D. F., Han, D. C., Moore, J. Z., Miller, S. R. "Looks can be deceiving: Gaze pattern differences between novices and experts during placement of central lines," *38th Annual Meeting of the Association for Surgical Education (ASE),* May 1st -3rd, 2018, Austin, TX. [www.surgicaleducation.com/annual-meeting-2018-presentations/?prognum=PS2+-+04]

2 Sonntag, C. C., Yovanoff, M. A, Pepley, D. F, **Prabhu, R.**, Miller, S. R., Moore, J. Z., Han, D. C. "Can a Haptic Robot Train New Interns to Place Central Venous Lines?" *13th Annual Academic Surgical Congress (ASC),* January 30 - February 1, 2018, Jacksonville, FL. [www.asc-abstracts.org/abs2018/75-08-can-a-haptic-robotic-train-new-interns-to-place-central-venous-lines/]

1 Pepley, D. F, Sonntag, C. C., **Prabhu, R.**, Yovanoff, M. A, Han, D. C., Miller, S. R., Moore, J. Z. "A Comparison of a Modified Polyvinyl Chloride Mixture against traditional Simulation Materials for Ultrasound Phantoms," *18th Annual International Meeting on Simulation in Healthcare,* January 13th – 17th, 2018, Los Angeles, CA. [http://doi.org/10.1097/SIH.0000000000000294]

### Invited Talks, Poster Presentations, and Other Research Presentations

Invited Talks and Other Research Presentations

9 "The Human Side of Creativity and Design for Additive Manufacturing," 2022 DfAM Accelerator at Penn State University, September 2022.

8 "Studying the Human Element in Engineering Design," University of Petroleum and Energy Studies, Dehradun, India, April 2022.

7 "Investigating the Role of Individual Differences in Sustainable Design Education," 2022 Scholarship of Teaching & Learning Forum organized by the Lehigh Valley Association of Independent Colleges (LVAIC), March 2022.

6 "Towards Encouraging Creativity in Engineering Design by Leveraging Additive Manufacturing," Department of Mechanical Engineering at Auburn University, April 2021.

5 "Educational Interventions to Encourage Creativity through Design for Additive Manufacturing," 4th Additive Manufacturing Virtual Colloquium organized by the Penn State Center for Innovative Material Processing through Direct Digital Deposition (CIMP-3D), January 2021.

4 "How Does It Affect Me? The Need for Empathy in a Sustainable World," NSF Essay Competition Session at the 2020 ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDETC-CIE), August 2020.

3 "Encouraging Creativity Through Additive Manufacturing," (research elevator pitch) Penn State Materials Day 2019, October 2019. [www.mri.psu.edu/mri/events/materials-day-2019]

2 "Complex Solutions for Complex Problems? Exploring the Effects of Task Complexity on Student Use of Design for Additive Manufacturing and Creativity," 2019 College of Engineering Research Symposium, April 2019.

1 "But Can We Use It? Exploring the Effects of Teaching Designing for Additive Manufacturing on Creativity and the Design Process," 2018 College of Engineering Research Symposium, April 2018.

Poster Presentations including Student Presentations

9 Herrera, J. "Design, Development, and Evaluation of a Landfill Model for Waste Management Education," 2023 National Conference on Undergraduate Research, Spring 2023.

8 *Mastroly E. and *Greeley J. "Investigating the Role of Creativity in the Design of Environmentally Sustainable Solutions," Lafayette College Undergraduate Research Symposium, Lafayette College, Fall 2022.

7 *Mastroly E. and *Greeley J. "Investigating the Role of Creativity in the Design of Environmentally Sustainable Solutions," Lehigh Valley Symposium on CRISPR Implementation and Ethics, Lafayette College, Fall 2022.

6 **Prabhu R.**, Simpson T. W., Miller S. R., Meisel N. A. "Built to Win? Encouraging Creativity through Design for Additive Manufacturing," Stuckman Center for Design Computing Flash Symposium 2020, Penn State, Fall 2020. (https://sites.psu.edu/flashscdc/).

5 **Prabhu R.**, Simpson T. W., Miller S. R., Meisel N. A. "Favoring Complexity: Investigating Concept Selection in Design for Additive Manufacturing Tasks," US Marine Corps Practicum on Additive Manufacturing at the Penn State Center for Innovative Material Processing through Direct Digital Deposition (CIMP-3D), Spring 2020.

4 **Prabhu R.**, Sinkpon, A. (Design Studio Project) "A Model for Repurposing Supercomputers," Penn State College of Engineering Design Showcase, Spring 2017.

3 **Prabhu R.** (with students from EDSGN 558: Systems Design) "Designing a System to Prevent Falls for the Elderly," Penn State College of Engineering Design Showcase, Spring 2017.

2 **Prabhu, R.**, Scaramal, M., Sinkpon, A., Yovanoff, M. (Design Studio Project) "Redesigning Lifting Tools Used in Farms for Improved Ergonomics," Penn State College of Engineering Design Showcase, Fall 2016.

1 **Prabhu, R.**, Scaramal, M., Sinkpon, A., Yovanoff, M. (Design Studio Project) "Decommissioning Supercomputers for Rural Education," Penn State College of Engineering Design Showcase, Fall 2016.

### Publication Profiles

Google Scholar: http://scholar.google.com/citations?user=O2-N3TQAAAAJ&hl=en

ResearchGate: www.researchgate.net/profile/Rohan_Prabhu2

ORCID: www.orcid.org/0000-0002-9952-2030

Semantic Scholar: www.semanticscholar.org/author/Rohan-Prabhu/49682948

### Awards, Grants, and Scholarships (Including Student Awards)

2023

- **Claire Boothe Luce Research Scholarship** (Spring 2023): Awarded to Jenna Herzog, Project: Student Perceptions on Problem Framing in Sustainable Design Education
- **CBL Ally Research Scholarship** (Spring 2023): Awarded to Evan Brown, Project: Reflection on Social Identity in Human Centered Design
- **NSF Improving Undergraduate STEM Education Grant (IUSE)** ($320,509): Leveraging Psychological Distance and Empathy towards Effective Sustainable Design Education. Collaborators: Elizabeth Starkey and Mohammad Alsager Alzayed. [Under Review]
- **The Bergh Family Fellows Interdisciplinary Research Teams Program:** The Op-Ed Project at Lafayette. Collaborators: Nandini Sikand, Seo-Hyun Park, and Khadijah Mitchell. [Under Review]
- **The Bergh Family Fellows Interdisciplinary Research Teams Program:** A multi-agent analysis of food access in Easton. Collaborators: Rui Jie Peng and Ernest Nkansah-Dwamena. [Under Review]

2022

- **ARC Preparation/Publication/Production Grant:** Awarded towards J16
- **EXCEL Research Scholarship** (Summer 2022, Fall 2022): Awarded to Emily Mastroly, Project: Problem Formulation in Sustainable Design Education
- **Claire Boothe Luce Research Scholarship** (Fall 2022, Spring 2023): Awarded to Rebekah Fodale, Project: Problem Framing in Sustainable Design Education
- **Claire Boothe Luce Research Scholarship** (Summer 2022, Fall 2022): Awarded to Julia Greeley, Project: Creativity and Sustainable Design

- **CBL Ally Research Scholarship** (Summer 2022): Awarded to Sam Milhaven, Project: Rapid Feedback Using Eye Tracking
- **Reviewer of Distinction Award:** American Society of Mechanical Engineering – Journal of Mechanical Design [https://doi.org/10.1115/1.4053527]

2021

- **Daniel O'Neil Senior Research Grant:** Awarded to Jenny Chen, Project: Measuring Cognitive States in Engineering Design using Eye-Tracking.
- **Distinguished Paper Award**: International Journal of Design Creativity and Innovation, Co-authors: Jennifer E. Bracken, Clinton B. Armstrong, Timothy W. Simpson, and Nicholas A. Meisel.
- **Shortlisted for Best Paper Award**: 18th International Conference on Design Education at the ASME 2021 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, Co-authors: Scarlett R. Miller, Timothy W. Simpson, and Nicholas A. Meisel.

2020

- **NSF Student Essay Competition** at the ASME 2020 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (includes a travel grant). (see: https://idetctravel.com/)
- **Shortlisted for the Best Paper Award**: 17th International Conference on Design Education at the ASME 2020 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, Co-authors: Scarlett R. Miller, Timothy W. Simpson, and Nicholas A. Meisel.

2019

- **Design Engineering Division Travel Grant ($200)**: ASME 2019 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
- **Best Paper Award**: 16th International Conference on Design Education at the ASME 2019 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, Co-authors: Scarlett R. Miller, Timothy W. Simpson, and Nicholas A. Meisel.
- **Finalist at the 5th Annual Millennium Café Pitch Competition** organized by the Penn State Materials Research Institute.

2012-2016

- **All India Engineering Entrance Exam Merit Scholarship** – Full undergraduate tuition waiver for all-India rank holders under 2000 (All India Rank 1469).

### Assistance in Securing Funding

2019

- **NSF Engineering Design and Systems Engineering (EDSE)** grant exploring the intersection between crowdsourcing and digital manufacturing guidelines, PI: Nicholas A. Meisel, Co-PIs: Jessica D. Menold and Chris McComb. (Not funded)
- **Penn State's Program for Undergraduate Research:** Assisted in securing funding for an undergraduate research assistant (Rainmar Leguarda).

2018

- **Penn State Multi-Campus Research Experience for Undergraduates Program:** Assisted in securing funding for an undergraduate research assistant (Misael Carlos Vera).

2017

- **Institute of Cyber Sciences Seed Grant Program:** 'Repurposing of Decommissioned Supercomputers for K-12 Education (RDS K-12)', PI: Kathleen Hill. (Based on a Design Studio Project) https://news.psu.edu/story/462198/2017/04/12/institute-cyberscience-announces-2017-ics-seed-grant-recipients

### Workshop Organization

2021

- Workshop on 'Task-based Educational Interventions on Design for Additive Manufacturing' at the ***ASEE 2021 Annual Conference*** with Nicholas A. Meisel, Timothy W. Simpson, Scarlett R. Miller, and Stephanie Cutler.
- ASME Design Education Committee Mentorship Workshop at the ***ASME 2021 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference***

## TEACHING EXPERIENCE

### Lafayette College

Courses Taught

- ES 101: Intro to Engineering [Module: Thinking about Thinking Creatively] — Fall 2021, Fall 2022
- ME 497/498: Senior Design — Fall 2021/Spring 2022, Fall 2022/Spring 2023
- ME 331L: Instrumentation and Data Acquisition Lab — Spring 2023

New Courses Developed

- ME 310: Design for Additive Manufacturing — Spring 2022, Spring 2023

Guest Lectures

- 'You Have Your Clients' Needs… What's Next?' in CE 331: Project Management, Lafayette College, Fall 2022.

### Penn State

Guest Lectures

- 'Overview of Design for Additive Manufacturing' in EDSGN 462: Intro to Design for Additive Manufacturing, Penn State University, January 2021.
- 'Design for Additive Manufacturing' in EDSGN 100: Introduction to Engineering Design, Penn State University, December 2020.
- 'Data Analysis and Research Design' in EDSGN 548: Interaction Design, Penn State University, March 2020.
- 'Qualitative Research Methods' in EDSGN 548: Interaction Design, Penn State University, March 2020.
- 'Design for Additive Manufacturing' in EDSGN 100: Introduction to Engineering Design, Penn State University, November 2019.

Project Mentorship

Penn State Advanced Vehicle Team (www.hev.psu.edu)

Roles: Project Manager (Fall 2016) and Engineering Manager (Spring 2017).

Contributions: Co-leading a team of 30 undergraduate students in developing a hybrid Chevrolet Camaro.

### National Institute of Technology Karnataka

Teaching Assistant

Tutelage Program for Scheduled Castes and Scheduled Tribes (Fall 2013)

Course: Elements of Mechanical Engineering.

Contributions: Assisting the professor in teaching the course content and organizing office hours.

Project Leadership

NITK Baja Racing (http://baja.nitk.ac.in)

Role: Team Lead (2015-2016).

Contributions: leading a team of 25 undergraduate students to develop an all-terrain race vehicle.

## SERVICE AND PROFESSIONAL ACTIVITIES

### Service and Leadership

### Lafayette College

Advising

Engineers Without Borders - Lafayette College Chapter

Role: Faculty Advisor, Micro Food Pantry Project

Committee Membership

Curriculum and Education Policy Committee (2022-2023)

Faculty Search Committee

- Mechanical Engineering (Start: Fall 2023)
- Integrative Engineering and Mechanical Engineering (Start: Fall 2023)

### The Pennsylvania State University

Leadership

Association for India's Development, Penn State Chapter (www.aidpennstate.com)

Roles: President (2020-2021), Vice President (2019-2020), and Outreach Coordinator (2018-2019).

Penn State Advanced Vehicle Team (www.hev.psu.edu)

Roles: Project Manager and Engineering Manager (2016-2017).

Diversity, Equity, and Inclusion

Student Representative, Committee on Anti-racism, Department of Mechanical Engineering.

Subcommittees: 1. Curriculum Reform and 2. Supporting Graduate and Undergraduate Students

Other Service

Reviewer, 2020 Undergraduate Research Exhibition.

Student Committee Member, 2020-21 Faculty Search, Department of Mechanical Engineering.

### National Institute of Technology Karnataka

Leadership

NITK Baja Racing (http://baja.nitk.ac.in)

Roles: Team Lead (2015-2016) and Team Member – Transmission and Design (2013-2015).

Outreach and Inclusion

NITK Rotaract Club (http://rotaract.nitk.ac.in/)

Role: Student Executive Member (2013-2016).

## Professional Organizations

Lehigh Valley Research Consortium (https://lvaic.org/for-faculty/lehigh-valley-research-consortium/)

Role: Executive Board Member

National Institute for Metalworking Standards

Role: Subject Matter Expert in Developing Standards for Additive Manufacturing Education

Outreach

ASME Design Education Committee (http://bit.ly/ASMEdec)

Role: Outreach Chair (2020-2022)

Professional Membership

- ASME: American Society of Mechanical Engineers (Student Membership: 2017 – Present)
- The Design Society (Associate Membership: 2019 – Present)
- ASEE: American Society of Engineering Education (Student Membership: 2019 – Present)
- SAE: Society of Automotive Engineers (Student Membership: 2012 – 2016)
- Rotaract Club NITK (Student Executive Member: 2013-2016)

Peer Review

Journals

- International Journal of Design Creativity and Innovation
  - 2022: Distinguished Paper Selection Panel
- Journal of Mechanical Design
  - 2022: 2
  - 2021: 3 [Awarded Reviewer with Distinction]
  - 2020: 1 (Assisted)
- Design Science Journal
  - 2022: 1
- Frontiers in Psychology
  - 2022: 1
- Journal of Engineering, Design and Technology
  - 2022: 2
- ASTM – Selected Technical Papers
  - 2022: 1
- Cogent Engineering
  - 2022: 1
- Journal of Engineering Design
  - 2021: 1
- International Journal of Engineering Education
  - 2022: 1
  - 2021: 2
- International Journal of Precision Engineering and Manufacturing-Green Technology
  - 2021: 1
- Frontiers in Manufacturing (Review Editor in Additive Processes: 2021 – Present)
  - 2022: 1

- Rapid Prototyping Journal
  - 2020: 1 (Assisted)
- Journal of Computer Assisted Learning
  - 2020: 1 (Assisted)

Conferences

- Design in Engineering Education Division – ASEE Annual Conference
  - 2021: 1
- Faculty Development Division – ASEE Annual Conference
  - 2021: 1
- Design Theory and Methodology Conference – ASME IDETC
  - 2022: 3
  - 2021: 2
  - 2020: 1
- Design for Manufacturing and the Life Cycle Conference – ASME IDETC
  - 2021: 1
  - 2020: 1
- Design Automation Conference – ASME IDETC
  - 2022: 1
  - 2021: 2
  - 2020: 1
  - 2019: 1 (Assisted)
- Design Education Conference – ASME IDETC
  - 2020: 1
  - 2019: 2 (Assisted)
  - 2018: 1 (Assisted)
- Solid Freeform Fabrication Symposium
  - 2019: 1 (Assisted)
  - 2018: 1 (Assisted)

Other Service

Review Coordinator

ASME Design Education Conference (2021, 2022)

Session Chair/Co-Chair

ASME Design Education Conference (2021, 2022)

## Professional Development

2022

- **New Faculty Orientation** by the Center for the Integration of Teaching, Learning, and Scholarship at Lafayette.
- **DELTA New Faculty Institute** by the American Society for Engineering Education.

2020

- **'Accelerating Design with Human-Machine Teaming'** at the 2020 Design Computing and Cognition Conference.
- **'Shape Matching for CAD'** at the 2020 Design Computing and Cognition Conference.
- '**Course on College Teaching'** at Penn State by the Schreyer's Institute for Teaching Excellence.

- **'Instructional Foundation Series'** at Penn State the Schreyer's Institute for Teaching Excellence.
- **'Preparing for a Life in Academia – AME/ISE6970'** at the University of Oklahoma by Professors Farrokh Mistree and Janet K. Allen.

2019

- **11th Broadening Participation Workshop on 'Leveraging Strengths for Effective Communication and Collaboration'** at the 2019 ASME International Design Engineering Technical Conferences.

2018

- **10th Broadening Participation Workshop on 'Career Development'** at the 2018 ASME International Design Engineering Technical Conferences.

2017

- **International Design Thinking Week II** at the Hasso Plattner Institute (School of Design Thinking) titled 'Bring Ideas to Life'. Sponsor: The German Confederation of Skilled Crafts.
- **International Design Thinking Week I** at the Hasso Plattner Institute (School of Design Thinking) titled 'From Inspiration to Ideas'. Sponsor: ING DiBa.

## INDUSTRY AND DESIGN EXPERIENCE

*Also see Professional Development Section – Page 13*

### Industry Experience

LinkedIn: http://in.linkedin.com/in/prabhurohan

Design Intern – Mechanical Research, **Incredible Technologies (credr.com)**, Mumbai, India (Summer 2015)

Contributions: designing a loading and unloading mechanism for transporting motorcycles, designing and prototyping a weather-shed for mobile vehicle inspectors, and assisting the user experience team in visualizing motorcycles on the web interface.

Product Marketing Intern – Automotive Repair, **Stanley, Black, and Decker Inc.**, Dubai, UAE (Summer 2014)

Contributions: surveying the use of hand and power tools in the automotive repair market to identify potential key verticals and assisting in establishing collaborations with these key verticals.

Manufacturing Intern – Powertrain, **Fiat India Automobiles Pvt. Ltd.**, Pune, India (Summer 2013)

Contributions: investigating potential sources of failure in the honing finishing process of engine cylinder bores and proposing potential corrective measures.

### Design Experience

Design Portfolio: www.drive.google.com/file/d/1wxh5J8d8bF1xKQgxeDwlUfug9UmMdEU-/view

Global Engineering Teams (April 2017 – September 2017)

Developed a concussion management tool for amateur athletes in collaboration with a team of engineers from South Africa, South Korea, and Germany. Organized by Penn State University in collaboration with Stellenbosch University and D-School at Hasso Plattner Institute.

Supercomputer Decommissioning Project (Fall 2016 – Spring 2017)

Sponsor: Institute for Computational Sciences and Center for Science and the Schools at Penn State.

Repurposed server clusters towards rural education and outreach.

Green Heron Tools Lifting Project (Fall 2016 – Spring 2017)

Sponsor: Green Heron Tools Inc.

Design of lifting equipment for farm objects specially designed for female farmers.

Golf Swing Trainer Project (Spring 2017)

Sponsor: Golf Teaching and Research Center at Penn State.

Developed concepts for a golf swing trainer to incorporate swing speed and face to path angle.

Penn State Advanced Vehicle Team (www.hev.psu.edu) (2016-2017)

Sponsor: General Motors and U.S. Department of Energy.

Co-leading a team of 30 undergraduate students in developing a hybrid Chevrolet Camaro with direct responsibilities of managing the mechanical design and project management subsystems.

NITK Baja Racing (http://baja.nitk.ac.in) (2013-2016)

Contributions: leading a team of 25 undergraduate students to develop an all-terrain race vehicle.

Key achievements: (1) designing and manufacturing a chassis that weighed less than 50% of the previous design, (2) creating a suspension-chassis-transmission architecture to shift from a manual gearbox to a continuously variable transmission, and (3) expand team membership beyond mechanical engineering to attract students from management, marketing, and computer science.

## Mentions in Popular Press

| | |
|---|---|
| Lafayette College Faculty Spotlight | Rohan Prabhu · News · Lafayette College<br>https://news.lafayette.edu/2021/09/20/rohan-prabhu/ |
| Design Alumni Spotlight | "Engineering Design Alumnus Uses Master's Skills to Boost Experiences in Doctoral Program"<br>https://www.sedtapp.psu.edu/news-archive/design-your-future-spotlights/prabhu-design-graduate-alumni-spotlight.aspx |
| Additive Manufacturing Media | "The Challenges of Teaching Creativity in Additive Manufacturing"<br>https://www.additivemanufacturing.media/blog/post/the-challenges-of-teaching-creativity-in-additive-manufacturing |
| Additive Manufacturing Chronicle | "Additive Manufacturing Education Part 3: Curriculum Review"<br>https://www.amchronicle.com/insights/additive-manufacturing-education-part-3-curriculum-reveiw/ |
| Materials Research Institute | "Millennium Cafe Elevator Pitch Competition 2019 Top 5 Winners"<br>https://www.youtube.com/watch?v=GyQNo0bO8fI&feature=emb_title |
| College of Engineering Research Spotlight | "Impacting Engineering Design Creativity Through Additive Manufacturing Education Research"<br>https://www.youtube.com/watch?v=4iFE-7IpaPo&feature=emb_title |
| Penn State News Story on DHRT Project | "Scholar Part of Research Team Working to Improve Medical Training"<br>https://news.psu.edu/story/507454/2018/02/28/research/scholar-part-research-team-working-improve-medical-training |
| Design Thinking Week | "Crowd Money: Rohan Prabhu Creates Multiple-Person Bank Account Smartphone Application During Design Thinking Week"<br>https://www.sedtapp.psu.edu/news-archive/Su17/design-thinking-week-prabhu.aspx<br>"Banking on Design: DESIGN Faculty and Students Participate in Direct Financial Service Design Challenge at Design Thinking Week in Berlin"<br>https://www.sedtapp.psu.edu/news-archive/Su17/design-thinking-week.aspx |