Ananya Nandy

Ph.D. Candidate @ UC Berkeley · Behavioral Science, Human-Centered Computing, & Design
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Education

University of California, Berkeley — Aug 2019 - Exp. Aug 2024
Ph.D. Mechanical Engineering (GPA: 3.97/4.0) — *Berkeley, CA*

University of California, Berkeley — Aug 2019 - Dec 2022
M.S. Mechanical Engineering — *Berkeley, CA*

Massachusetts Institute of Technology (MIT) — Aug 2015 - Jun 2019
B.S. Mechanical Engineering (GPA: 4.9/5.0) — *Cambridge, MA*

Research Experience

UC Berkeley – Co-Design Lab — Aug 2019 – Present
Graduate Researcher (Advised by Dr. Kosa Goucher-Lambert) — *Berkeley, CA*

- Conceptualized and conducted studies to investigate human behavior and decision making during design.
- Developed and deployed multiple interactive interfaces to collect data for studies (web-based and virtual reality).

Psychological and Computational Representations of Similarity

- Investigated methods (e.g., network modeling) to quantitatively determine functional similarity between designs.
- Developed psychological embeddings of functional similarity for comparison.

Interactivity and Immersion During Decision Making

- Applied interactive preference learning models to personalize designs along subjective dimensions.
- Characterized the impact of suggestions during AI-assisted design decision making in uncertain scenarios.
- Developed and tested novel spatial interactions for large-scale design space exploration in VR.

Toyota Research Institute – Future Product Innovation Group — May 2023 – Aug 2023
Human-Centered AI Research Intern (Advised by Dr. Shabnam Hakimi and Dr. Matthew Klenk) — *Los Altos, CA*

The Impact of Semantic Properties of Word Prompts on Design

- Led project to characterize the relationship between psycholinguistics and multi-modality (text, 3D) during design.
- Developed interactive interface to log actions and deploy study online.

Skills

Research Methods: Experimental Design, Statistical Analysis, Computational Modeling, Interactive Interfaces
Languages: Python, R, HTML/CSS/Javascript, C# (for Unity & Rhino/Grasshopper), MATLAB
Tools, Packages, & Software: Unity, Flask, Python Data Science Stack (pandas, numpy, scipy, scikit-learn, Pytorch, BoTorch), CAD (Autodesk Fusion 360, SolidWorks, OpenSCAD/JSCAD)
Other: Prototyping & Fabrication (3D Printing, Laser Cutter, Machining, Basic Electronics/Arduino/Raspberry Pi)
Relevant Coursework: Bayesian Models of Cognition, Immersive Computing & Virtual Reality, Algorithmic Human-Robot Interaction, Data Science, Designing for Emerging Technologies, User Interface Design, Machine Learning

Publications

Peer-Reviewed Journal Articles

3. Adopting "Blackbox" Design Advice: The Influence of Imperfect Suggestions during AI-Assisted Decision Making
   Ananya Nandy, David Antonio Herrera, Kosa Goucher-Lambert
   Design Science. Under Review.
2. Do Human and Computational Evaluations of Similarity Align? An Empirical Study of Product Function
   Ananya Nandy, Kosa Goucher-Lambert
   Journal of Mechanical Design. April 2022.
1. Evaluating Quantitative Measures for Assessing Functional Similarity in Engineering Design
   Ananya Nandy, Andy Dong, Kosa Goucher-Lambert
   Journal of Mechanical Design. March 2022. ★ **Featured Article**

Peer-Reviewed Conference Proceedings

6. Semantic properties of word prompts shape design outcomes: understanding the influence of semantic richness and similarity
   Ananya Nandy, Monica Van, Jonathan Li, Kosa Goucher-Lambert, Matthew Klenk, Shabnam Hakimi
   Design Computing and Cognition (DCC'24). Under Review.
5. Adaptive Optimization of Subjective Design Attributes: Characterizing Individual and Aggregate Perceptions
   Ananya Nandy, Kosa Goucher-Lambert
   ASME International Design Engineering Technical Conferences (IDETC'23). August 2023.
4. VR or Not? Investigating Interface Type and User Strategies for Interactive Design Space Exploration
   Ananya Nandy, James Smith, Nicholas Jennings, Michael Kuniavsky, Björn Hartmann, Kosa Goucher-Lambert
   International Conference on Engineering Design (ICED'23). July 2023.
3. How does machine advice influence design choice? The effect of error on design decision making
   Ananya Nandy, Kosa Goucher-Lambert
   Design Computing and Cognition (DCC'22). July 2022. 🏆 **Best Paper in Design Cognition/Neurocognition**
2. Aligning Human and Computational Evaluations of Functional Design Similarity
   Ananya Nandy, Kosa Goucher-Lambert
   ASME International Design Engineering Technical Conferences (IDETC'21). August 2021. ★ **Nominated for Best Design Theory & Methodology Paper**
1. A Comparison of Vector and Network-Based Measures for Assessing Design Similarity
   Ananya Nandy, Andy Dong, Kosa Goucher-Lambert
   ASME International Design Engineering Technical Conferences (IDETC'20). August 2020.

Extended Abstract & Workshop Papers

2. GeneratiVR: Spatial Interactions in Virtual Reality to Explore Generative Design Spaces
   Nicholas Jennings, **Ananya Nandy**, Xinyi Zhu, Yuting Wang, Fanping Sui, James Smith, Björn Hartmann
   ACM Conference on Human Factors in Computing Systems Extended Abstracts (CHI '22 LBW). May 2022.
1. Considerations for Collaborative Human-AI Decision-Making in Engineering Design
   Ananya Nandy, Kosa Goucher-Lambert
   NeurIPS 2021 Workshop on Human Centered AI. December 2021.

Teaching

Human-Centered Design Methods (MECENG292C/DESINV190) Fall 2020, 2022, 2023
Graduate Student Instructor *UC Berkeley*

- Mentored 14 graduate-level teams through human-centered design process each semester. 🏆 **Outstanding Graduate Student Instructor Award (2020)**

Design Methodology (DESINV15) Spring 2022
Graduate Student Instructor *UC Berkeley*

- Mentored 14 undergraduate-level teams in introduction to human-centered design and gave guest lecture.

Prototyping and Fabrication (DESINV22) Summer 2021
Graduate Student Instructor *UC Berkeley*

- Assisted students from interdisciplinary backgrounds complete projects for remote prototyping class.

Service & Mentorship

Graduate Women in Engineering Board
New Student Committee Chair *Aug 2023 – Present*

- Leading committee to organize outreach, professional development, and mentorship for first-years.

UC Berkeley Master of Engineering Capstone Mentor
A. Baradaran, R. Oberoi, V. Kansal: Trust Measurement for Human-Machine Interaction *Sept 2023 – May 2024*

UC Berkeley Engineering Design Scholar Program Mentor
Antonio Herrera: Human-AI Interactions in Engineering Design (co-author on journal paper) *Jun 2023 – Aug 2023*
Resham Khanna: XR as a Design Aid *Jun 2021 – Aug 2021*
Amy Jiang: Encouraging Sustainable Behavior through Gaming *Jun 2020 – Aug 2020*