Osazuwa J. Okundaye-Santos

Pronunciation: oh-SAH-zoo-wah JAY oh-KUN-day SAN-tohs
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Education

2017 – 2024	**Texas A&M University** Ph.D. Human Computer Interaction
2022 – 2024	**Texas A&M University** M.C.S. Computer Science (Non-Thesis)
2013 – 2017	**Texas A&M University** M.S. Visualization (M.S. Thesis: Use, Non-Use, and Appropriation of Large Non-Interactive Public Displays in Higher Education Contexts)
2008 – 2012	**Texas A&M University** B.S. Psychology

Experience

January 2024-Ongoing (January-Ongoing)

Researcher, Generative AI Data Bias in Architectural Typologies in Rural/Urban Contexts, AI & Robotics Research Group, Department of Architecture, School of Architecture, Texas A&M University, TX

Research project investigates how generative tools like Dall E and Midjourney can possess biases that can influence how these tools can be used by architects when deriving composite architectural designs that characterize a given socio-economic region within the US. How representative these designs are to real life could be influenced by how representative different communities are in existing training data. This works seeks to explore how this representation can influence how typologies are represented and are understood by existing generative models.

Spring 2023-Ongoing (January-Ongoing)

Researcher, Kerf Unit-Cell Affordances for Interaction and Sensing in FDM Manufacturing, Human Computer Interaction and Engineering Design Group (HCIED), Department of Computer Science, College of Engineering, Texas A&M University, TX

Kerfing is a subtractive manufacturing method to create flexible surfaces out of stiff planar materials. Slender cut patterns by strategically removing some portion away creates higher material flexibility on rigid materials, allowing for fabrication of complex surfaces on top of otherwise rigid substrates. In this project, 3D-printed Kerf patterns are studied to imprint freeform movement in purely rigid polymer materials available for FDM, such as PLA. As 3D printing becomes more accessible, Kerf structures that bend in single, double, or multiple axes leveraging kerfing would appeal to interested groups as a more widely approachable way of creating complex surfaces. Inheriting the principles and mechanics of subtractive kerf structures, the research proposes 3D printing parameters to change characteristics of Kerf units, cell density, and alignment of cells of different attributes (solid printing around sparse cells) that contribute to achieve dynamic microstructural behaviors. In addition, the design of Kerf for 3D printing broadens end-user options to imbue interactivity in 3D printed objects. Approach in project is validated through multiple applications and their interactions-- e.g., tangible user interfaces with tunable haptic feedback and robotic grippers.

Summer 2023-December 2024
(July-Ongoing) **Research Assistant, Generative Adversarial Network Applications in Architecture Typology Exploration, AI & Robotics Research Group, Department of Architecture, School of Architecture, Texas A&M University, TX**
Research project engages in iterative research and prototyping of a generative adversarial network for application within Architectural typology study. The project compiles a collection of large scale point clouds of buildings the purpose of which is to train a neural network that can be used to engage in ideation novel architectural forms all the while exploring the latent space that represents different architectural forms within different historical and spatial contexts.

Spring 2023-Summer 2023
(January – June) **Teaching Assistant, ENDS (Environmental Design) 101 Teaching Assistant, Department of Architecture, School of Architecture, Texas A&M University, TX**
ENDS 101 is an undergraduate design theory course that is taught at Texas A&M University. The course teaches fundamental design processes, issues, and theories relevant to design resolution and the creation of new ideas; creative thought processes from the formation of ideas through incubation to the final product and future impact on the physical environment and society. Comprising contributions from Texas A&M University's Department of Architecture, this course encourages and enables students to dream, envision, and generate new products, processes, services, experiences, and gestures of creative expression.

Fall 2022
(September – Dec.) **Research Intern, PhD – Android Nearby Team: Platforms and Ecosystems, Google (Mountain View), CA**
The internship project concerns the use of ultra wide-band (UWB) and neighbor awareness networking (NAN) and its affordance for measuring relative distances of interconnected devices such as smartphones. Investigated and adapted existing algorithms for the purpose of supporting the cross-device UWB-based sensing. There were two major components of the project: 1) Implement the Kalman filter algorithm in the context for both on-line and offline processing in UWB supported Android applications; 2) Research and develop machine learning classification models that uses previously collected UWB-based sensing data to identify shared-room and non-shared room awareness of connected devices using UWB ranging data alongside with BLE RSSI data.

Fall 2015 – Ongoing **Graduate Research Assistant – Texas A&M Embodied Interaction Lab (TEILab), Texas A&M University, TX**
Served as a research assistant for projects, "Tangible User Interfaces for Work Context Management", "Making in the Colonias", and "Making through Micro-Manufacturing", and "Technology Ecologies for Learning and Sensemaking". Formulated study designs. Facilitated user studies. Assisted in writing academic papers for journal publications. Maintained and operated various "Making" related equipment for fabrication.

Fall 2014,Spring 2017 **Instructor of Record for 'Introduction to 3D Modeling and Animation') – Department of Visualization, Texas A&M University, TX**
Taught concurrent sections of introductory sequence course for visualization undergraduates. Formulated weekly lesson plans and lectures. Instructed the use of 3D modeling package, 'Autodesk Maya' and taught the supporting theory on the animation pipeline.

Summer 2013	**Pipeline Lead (Software Developer**) **– Dreamworks Summer Industry Course**
	Was part of a assigned 6 member team within "Dreamwork Animation's summer animation program at Texas A&M University, culminating in the animation, "Eye-Robot". Contributions include shader development and the development of scripting tools for artists.

Publications
Peer-Reviewed Journals

Okundaye, O., Natarajarathinam, M., Qiu, S., Kuttolamadom, M. A., Chu, S., & Quek, F. (2022). Making STEM real: the design of a making-production model for hands-on STEM learning. *European Journal of Engineering Education*, 1-22.

Peer-Reviewed Conference Proceedings

1 **Okundaye O.,** Poluri K., Darnal A., Muliana A ., and Kim J., 2025. 3D Printed Kerf Structures. In Nineteenth International Conference on Tangible, Embedded, and Embodied Interaction (TEI '25), March 04–07, 2025, Bordeaux / Talence, France. ACM, New York, NY, USA, 15 pages. https://doi.org/10.1145/3689050.3704941

2 **Okundaye, O.,** Gomez,G. (2024, Under Review). "Lost in Information Space!": The role of environmental cues in Computationally Supported Work Context Management. Submitted to Proceedings of the 2025 ACM Computer Human Interaction Conference.

3 **Okundaye, O.,** Quek, F., Powell, L., Kim, S. (2024, Under Review). There and Back Again? Investigating the Role of Context Reinstatement Cues for Teleconferencing and In-person Meetings. Submitted to Proceedings of the 2025 ACM Computer Supported Collaborative Work Conference.

4 **Okundaye, O.,** Qiu, S., Natarajarathinam, M., Chu, S. L., Kuttolamadom, M., Li, Q., & Quek, F. (2022, August). 'All Together Now'-Integrating Horizontal Skills in CareerTechnical Education Classes with Making and Micro-manufacturing. In *2022 ASEE Annual Conference & Exposition*.

5 Thakare, K., & **Okundaye, O. J.,** & Li, Q., & Natarajarathinam, M., & Chu, S. L., & Kuttolamadom, M., & Quek, F. (2021, July), Design and Development of a Horizontal CTE Curriculum to Prepare Students for the New Manufacturing Economy (Work in Progress) Paper presented at 2021 ASEE Virtual Annual Conference Content Access, Virtual Conference. 10.18260/1-2—36905

6 **Okundaye, O. J.,** & Natarajarathinam, M., & Kuttolamadom, M., & Quek, F., & Chu, S. L. (2021, July), How Deep is Your Knowledge? Consideration to the Breadth and Depth of Knowledge of CAD/CAM in M3-powered Technology CTE Classes Paper presented at 2021 ASEE Virtual Annual Conference Content Access, Virtual Conference. https://peer.asee.org/37254

7 Berman, A., Quek, F., Woodward, R., **Okundaye Jr, O. J.,** Kim, Jeeun., (2020,Oct). "Anyone Can Print": Supporting Collaborations with 3D Printing Services to Empower Broader Participation in Personal Fabrication. In Proceedings of NordiCHI 2020.

8 **Okundaye Jr, O. J.,** Hordemann, G., Natarajarathinam, Chu, S. L., M., Kuttolamadom, M., Quek, F., (2020,Oct). Investigating Telepresence Robotics for Supporting Hands-on Distance Instruction. In Proceedings of NordiCHI 2020.

9 **Okundaye Jr, O. J.**, Natarajarathinam, Chu, S. L., M., Kuttolamadom, M., Quek, F., Berman, A. (2020, June). Making in the Colonias: Motivating STEM Participation through a Making as Micro-Manufacturing Model. In 2020 ASEE Annual Conference & Exposition.

10	Hordemann, G., Natarajarathinam, Chu, S. L., M., Kuttolamadom, M., Quek, F., **Okundaye Jr, O. J.** (2020, June). Everybody Needs Some Body to Teach: Embodiment, Telecommunication and Telepresence in STEM Learning. In 2020 ASEE Annual Conference & Exposition.
11	Okundaye Jr, O. J., Natarajarathinam, M., Kuttolamadom, M., Berman, A., Chu, S. L., & Quek, F. (2019, June). Developing Communities of Practice through Peer Mentorship in Making through Micro Manufacturing Model. In 2019 ASEE Annual Conference & Exposition.
12	Berman, A., Chu, S., Quek, F., **Okundaye, O.,** Yang, L., Deuermeyer, E., Berrios, E., Deady, S., Doss, J. (2019, March). Proximal and Distal Mentors: Sustaining Making-Expertise in Rural Schools. In FabLearn 2019). ACM.
13	**Okundaye, O.,** Chu, S., Quek, F., Berman, A., Natarajarathinam, M., & Kuttolamadom, M. (2018, June). From Making to Micro-Manufacture: Catalyzing STEM Participation in Rural High Schools. In Proceedings of the Conference on Creativity and Making in Education (pp. 21-29). ACM.
14	**Okundaye Jr, O.,** Kuttolamadom, M., Natarajarathinam, M., Chu, S. L., & Quek, F. (2018, June). Motivating STEM Participation through a 'Making as Micro-manufacture (M3)'Model. In 2018 ASEE Annual Conference & Exposition.
15	Angello, G., Chu, S. L., **Okundaye, O.,** Zarei, N., & Quek, F. (2016, June). Making as the New Colored Pencil: Translating Elementary Curricula into Maker Activities. In Proceedings of the The 15th International Conference on Interaction Design and Children (pp. 68-78). ACM.
16	**C**hu, S. L., Quek, F., Saenz, M., Bhangaonkar, S., & **Okundaye, O.** (2015, November). Enabling Instrumental Interaction Through Electronics Making: Effects on Children's Storytelling. In International Conference on Interactive Digital Storytelling (pp. 329-337). Springer, Cham**.**

Paper Abstracts

1	**O Okundaye, O.,** Quek, F., & Chu, S. (2019, June). Broadening Participation for Remote Communities: Situated Distance Telepresence. In Proceedings of the 18th ACM International Conference on Interaction Design and Children (pp. 494-500).
2	**Okundaye, O.,** Quek, F., Sargunam, S. P., Suhail, M., & Das, R. (2017, May). Facilitating Context Switching Through Tangible Artifacts. In Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems (pp. 1940-1946). ACM

Thesis

1	**Okundaye,O.** (2017). Use, Non-Use, and Appropriation of Large Non-Interactive Public Displays in Higher Education Context. MS Thesis, Department of Visualization, Texas A&M University, College Station, TX

Professional Activities

Mentoring

- **Collaborative Research: Preparing Students for the New Manufacturing Economy: An Integrative Learning Approach**
  - For the research project, we had a new graduate student from the Department of Industrial Distribution and Systems Engineering. I was responsible for integrating him into our existing research efforts in the project and to guide him where I saw fit to incorporate his knowledge from his field. Together, we designed an interdisciplinary curriculum that unites computing and industrial processes for an introductory course for high school students.

- **Coordinator for NSF Research Project Meeting:** *Collaborative Research: Preparing Students for the New Manufacturing Economy: An Integrative Learning Approach*
  - Served as a coordinator for faculty meetings where we discuss future directions for research studies, publications, and communications with our collaborators with the Webb county consolidated and Jim Hogg county school districts.

- **Coordinator for Research Project Exploration: Spatial Cognition in CAD CAM Design and Engineering Education**
  - Served as a coordinator for faculty meetings where we discuss the potential for interdisciplinary research in the role of CADCAM systems for supporting spatial cognition skills acquisition and ideation. Members present for the meetings are from different departments at TAMU or from industry, including Francis Quek (computer science and visualization), Mathew Kuttolamadom (Engineering Technology and Industrial Distribution), Vinayak Krishnamurthy (Mechanical Engineering), and Heather Burte (Psychology and Brain Sciences), and Jared Vanscoder (Autodesk).

Teaching

- *Instructor of Record for 3D Modeling and Animation (VIST 284) (Fall 2014,Spring 2017):*
  - Designed a curriculum sequence using a waterfall approach to build an efficient animation pipeline in Autodesk Maya, covering interface control, polygonal and NURBS modeling, shading, texturing, UV mapping, skeletal rigging, keyframe animation (joints and blend shapes), lighting, rendering, and particle effects.
  - Independently developed course assignments and projects, later shared with future instructors.

  - Taught multiple sections: two sections of 25 students in Fall 2014, and three sections of 25 students in Spring 2017.
- *Teaching Assistant for VIST 271, Computation for Visualization II (Fall 2016):*
  - VIST 271 is the second course in a two-part object-oriented programming sequence for undergraduate visualization students. It teaches C++ in the context of graphics programming for games, animation, and simulation. Using OpenGL and GLUT, students learn to build interactive, well-structured programs that support future coursework in the visualization curriculum.
  - Developed programming assignments and assisted with grading as a teaching assistant.
  - Students learned the following: 1) Basics of C++ programming; 2) How object orientation supports thinking and interaction with graphical objects; 3) How object orientation supports interaction through user generated events and signals.

- *Research Coordinator, Instructor, and Curriculum Designer for NSF Supported Research Projects ('Making through Micro Manufacturing'):*
  - The project, Making through Micro Manufacturing, was a multi-year initiative aimed at using Making to teach STEM skills to high school students in underserved communities along the Texas-Mexico border (the Colonias). Recognizing the difficulty these areas face in retaining instructors, our team developed an online curriculum co-taught by the onsite teacher and me in a daily 10-student classroom. In the first year, we integrated fabrication, electronics, and programming with industrial systems engineering to create a

hands-on, context-driven learning experience. Students designed and produced instructional science kits for use in elementary classrooms within their district. Over the course of the academic year, students gained the following skills:

- Experience in digital fabrication through low-volume production of real-world artifacts, such as science kits for elementary schools.
- Developed greater self-efficacy in making and engineering, fostering a "Maker Mindset" rooted in resilience, optimism, and problem-solving.
- Interdisciplinary skills, demonstrating how diverse competencies are needed for designing and producing fabricated objects.

- *Guest Lecturer in Texas A&M Embodied Interaction Lab (TEILab) for Eyetracking Walkthrough (Summer 2023):*
  - As a member of the Texas A&M Embodied Interaction Lab (TEILab), I was tasked by the PI to learn and teach the lab how to use a newly acquired portable eye-tracking device. Specifically, I designed a tutorial for the open-source Pupil Core eye-tracking software and hardware platform.
  - Developed and delivered a two-hour tutorial introducing eye-tracking methods with an emphasis for HCI applications.
  - Designed the tutorial session with a focus on introducing new researchers in becoming confident with the eye-tracking as a methodology, explaining its theoretical foundations, how to set it up in practice, data collection, and how to analyze/interpret the collected data.

- *Guest Lecturer in Digital Fabrication Studio (CSCE 667) (Fall 2019, Fall 2023, Fall 2024)*:

  - As a member of the Human-Computer Interaction Engineering Design (HCIED) group at Texas A&M, I was invited by the PI, to guest lecture on three course topics. In the first lecture, I taught students Autodesk Fusion 360 for AEC design and fabrication, including exporting models and using CURA slicer with Ender 3 and Ultimaker 3 FDM printers. The second lecture introduced 3D metamaterials, their function, and a prototype CAD-CAM editor (Metamaterial Mechanisms by Ion et al.). Students learned to design flexible, compliant mechanisms for 3D printing and class projects. I later expanded this topic to include 3D Printed Kerf Structures (Okundaye et al.), allowing students to experiment hands-on.

  - Designed and developed lecture and tutorial materials used in subsequent course iterations.

  - Guest lectured six times to classes of 20 students during Fall 2019, 2023, and 2024 semesters.

Prior Support

2020-Ongoing	Collaborative Research: Preparing Students for the New Manufacturing Economy: An Integrative Learning Approach (Award Abstract # 1949439)
2017-2020	Making in The Colonias: Motivating STEM Participation through a Making as Micro-Manufacturing Model (NSF Award Abstract Award Abstract # 1623543)
2017	Convergence HTF: From Making to Micro-Manufacture: Reimagining Work Beyond Mass Production (NSF Award Abstract # 17444230)
2016-2017	Device and Display Ecologies (NSF Award Abstract # 1439614)

Service & Affiliations
Conference Reviewer

2024	Reviewer for CHI 2025
2021	Associate Committee Member Reviewer for TEI 2022
	Reviewer for CHI 2021 Late Breaking Work
	Reviewer for IDC 2021 Full and Short Papers

| 2020 | Reviewer for IDC 2020 Full and Short Papers |

Volunteer

2025-2026	ACM TEI(Tangible, Embedded and Embodied Interaction) Conference (Chicago, Illinois) 2026: Serving as the registration chair for the conference.
April 13-17, 2021	ACM IUI (Intelligent User Interfaces) Conference (College Station) 2021: Serving as the registration chair for the conference.
May 6-11, 2017	SIGCHI Student Volunteer: CHI 2017
May 7-12, 2017	Student Volunteer: CHI 2016

Other

| Spring 2018-Ongoing | President Texas A&M ACMSIGCHI Student Chapter |
| July 2015 – Dec 2015 | "HCI@Viz" Seminar Series Coordinator at Department of Visualization, College of Architecture, Texas A&M University |

Affiliations

ACM SIGCHI
American Society for Engineering Education

Osazuwa J. Okundaye-Santos, Ph.D.
Human–AI Interaction Researcher | **Generative AI & Ethical Representation** |
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Ph.D. in Human–Computer Interaction specializing in human-centered AI systems, representational fairness, and embodied interaction. Experienced in designing and evaluating AI-driven interactive prototypes across the span of physical and digital environments. His work bridges data analysis, generative modeling, and user-centered design ensuring that AI systems are explainable, transparent and aligned with human needs/values.

RESEARCH & PROFESSIONAL EXPERIENCE

- **Researcher, Human–AI Interaction AI & Robotics Research Group – Texas A&M University| 2024–2025**
  - Lead interdisciplinary studies examining inherent representational bias in generative AI, linking fairness and alignment principles to sustainable model development.
  - Designed and implemented large-scale prompt–image datasets for diffusion model evaluation (DALL-E, Midjourney), identifying systematic disparities in rural–urban representations.
  - Design and developed a bias-aware model auditing guidelines for Generative AI applications for designers.
  - Developed ethical AI design frameworks emphasizing embodied interaction and context sensitivity — positioning representational fairness as essential to social sustainability.
- **Research Associate, Human Computer Interaction and Engineering Design Group – Texas A&M University | 2023–2025**
  - Developed a novel kerf-based 3D printing method enabling **flexible, deformable interaction devices**.
  - Explored integration with **sensing + adaptive AI** control for embodied, multimodal systems.
  - Designed and evaluated **3D-printed artifacts** with **capacitive** and **Hall-sensor inputs**; integrated low-level sensor data for contextual state recognition.
  - Published findings at **TEI 2025**, highlighting methodologies for embodied HCI prototyping.
- **Graduate Research Intern/SWE, PhD — Google, Android Nearby Team · Mountain View, CA | 2022**
  - Implemented ML classifiers combining **UWB + BLE signals** to achieve robust **device proximity detection**.
  - Delivered prototypes aligned with product requirements for **secure device-to-device interaction** in Android.
- **Research Collaborator, Remote Learning Robotics Project – NSF-funded Telepresence Robotics for Hands-On Distance Instruction (TEILab) | 2017–2022**
  - Designed user studies assessing remote collaboration and embodiment in telepresence robotics.
  - Contributed to system evaluation and visualization design for human–robot shared task awareness.
  - Compared **in-person, video, and robotic presence** → validated robotics as a usable teaching interface.
- **Doctoral Researcher, TAMU Embodied Interaction Lab (TEILab) – Texas A&M University| 2017–2022**
  - Dissertation: Mental Context Reinstatement in Digitally Represented Work through Computationally-Augmented Physical Artifacts
  - Conducted **human-subjects experiments** using **eye tracking** and **pupillometry** to model **cognitive workload** and visual engagement during task resumption.
  - Developed **Python-based data processing** and **visualization tools** for multimodal

attention datasets.
  - ○ Proposed human-centered design strategies for adaptive work interfaces that support cognitive and physical well-being.
  - ○ Developed **Work Context Manager,** a tangible-user interface system bridging physical and digital task transitions through embedded sensing. Published in **ACM CHI 2017** as ***"Context Switch Through Tangible Artifacts"***.

TECHNICAL SKILLS

- **Programming and Data**: Python (Pandas, NumPy, Matplotlib, Seaborn, Scikit-Learn), C++.
- **Prototyping & Fabrication:** 3D Printing (FDM and SLA), Arduino, sensors (Hall-effect, capacitive sensing), electronics fabrication.
- **UX & HCI Methods:** Eye-tracking, pupillometry, user studies, mixed-methods analysis, heuristic evaluation
- **AI/ML Tools**: PyTorch,TensorFlow, Diffusion Models, LLMs, GANs, CLIP, LangChain, bias auditing pipelines, dataset curation.
- **Generative AI Applications**: Image generation, fairness evaluation, multimodal UX
- **Research Methods**: Eye-tracking, cognitive load modeling, user studies, multimodal analysis
- **Version Control & Deployment:** Git, Linux, and API integration.

SELECTED PUBLICATIONS

- *Diffused Countryside: Eliminating Bias in Generative AI for Rural Environments (in prep., 2025).*
- *Work Context Management Systems (preprint-available upon request).*
- *[3D Printed Kerf Structures](#) (TEI 2025, accepted).*
- *[Telepresence Robotics for Hands-on Distance Instruction](#) (NordiCHI 2020).*
- *[Context Switch Through Tangible Artifacts](#) (CHI LBW).*
- *[Link to Google Scholar](#)*

EDUCATION

- **Ph.D. Human-Computer Interaction** | Texas A&M University | 2017–2024

- **M.C.S. Computer Science** | Texas A&M University | 2022–2024

- **M.S. Visualization (Computer Graphics and Animation)** | Texas A&M University | 2013–2017

- **B.S. Psychology** | Texas A&M University | 2008–2012

RESEARCH THEMES & INTERESTS

Human–AI Interaction • Representational Fairness • Sustainable & Ethical AI Systems • Multimodal Interaction • Human-Centered Design • Cognitive & Physical Well-being • Tangible Interfaces