Jingkui Gao

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RESEARCH INTERESTS

My research agenda is situated at the intersection of **computational design**, **children**, and **human wellness/education**.

- Developing prototypes for **assistive or therapeutic technologies** for neurodiverse or underserved communities, utilizing digital fabrication and/or child-machine interaction technologies to address specific challenges they face in both the digital and physical world.
- Exploring prototypes of emerging technologies in computing for use in children's **learning processes**, such as gaming, AR, VR, user-centered artificial intelligence, and/or digital fabrication.

EDUCATION BACKGROUND

University of Michigan - Ann Arbor June 2022 – May 2023
Master of Science in Digital and Material Technologies(GPA 3.94/4) Ann Arbor, MI

Chongqing University Sept 2014 – June 2019
Bachelor of Architecture(Excellent Graduation Design (top10%))(Advanced GPA 3.65/4) Chongqing, China

PUBLICATION

"Interactive assistive therapy space design for Autism", *Jingkui Gao,* Xiaodong Li, Lijiu Huang, **ACADIA 2024**

- Integrated autism therapy theories(Deep pressure therapy and Play therapy) to propose a dynamic interaction assistive child-center play therapy space prototype, facilitating therapeutic engagement and supporting the specific sensory and social interaction needs of autistic children.
- Developed a digital knitting technology tool to translate 3D geometry into knitting files for fabrication, and created a responsive prototype with pneumatic systems and digital knitting textile for an interactive play space component.
- Collaborated with autism therapy professionals and tested the design successfully with 15 autistic children (ages 4-8) over four days to ensure an evidence-based approach that meets community needs.
- Awarded a $4500(total) research grant from the UM-Graduate School.
- Presented at ACADIA 2024 conferences.

RESEARCH EXPERIENCES

Cultivating Children's Critical Thinking Through AR Games: Epics of Terracotta Warrior April 2024 –Present

- Developed an augmented reality (AR) game through Unity XR Interaction Toolkit and Oculus headset with interactive mechanics, immersive storytelling, and thought-provoking themes to enhance critical thinking as players navigate real historical scenarios.

How Human Waste Affects the Environment: Ecology Simulations Using Game Engines Jan 2023 – April 2023

- Designed an interactive game using the Unity game engine to simulate the impact of human-generated waste on ecosystems, enabling players to experiment with characters, observe real-time environmental consequences, and promote awareness of human-ecological relationships and sustainable waste management practices.

Enhancing the Participatory Design Process with Extend Reality: Wellness Room Design Jan 2023 – April 2023

- Proposed a wellness room prototype within a healthcare space leveraging VR and AR technologies and developed a rapidly iterated design approach based on user feedback from immersive experiences.
- collaborated with the University of Michigan's Nursing School for testing and optimization.

Fostering Emotional Connections Using Machine Learning for Marginalized Groups in Cities Jan 2023 – April 2023

- Designed a dynamic responsive device with the tree as a physical meduim to foster emotional connections and provide mental support to marginalized residents by visualizing emotions extracted from images posted on platforms like Weibo using Image Emotion Semantic Recognition through machine learning.

Facilitating Democratic Participatory Design with Natural Language Processing Tech Feb 2019 – July 2020

- Developed an NLP-based platform for public participation through commenting, liking, and selecting reference images, providing designers with insights from high-frequency keywords reflecting community needs.
- Proposed conceptually an app store integrating human-computer interaction, where community-expressed needs are translated into modular designs that can be selected by the public and incorporated by professionals.

SKILLS

- Software Skills: Unity, Blender, Rhino, Arduino, Grasshopper, Photoshop, Illustrator, InDesign, Premiere.
- Programming Skills: Python, C#.