Interdisciplinary Collaborations Through the Institute for Applied Creativity

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Abstract

The Institute for Applied Creativity (IAC) at Texas A&M University serves as a dynamic hub for interdisciplinary collaboration. At its core, the IAC embraces a fusion of experimental, rational, intuitive, and analytical approaches to achieve concrete results. It tackles critical issues that resonate with communities worldwide, initiating solutions at a local level and scaling them for global impact. This institutional presentation showcases the IAC's key activities, spotlighting notable projects that span research, teaching, and outreach efforts.

Keywords

Interdisciplinary research, institute, immersive education, arts in health, AI, creativity

Introduction

The Institute for Applied Creativity (IAC) is dedicated to pushing the boundaries of human creativity by driving advanced technology, innovative research, and empowering education. By offering cutting-edge tools and critical insights, we enable individuals and organizations to address challenges, harness innovation, and make a significant impact on society.

The IAC will achieve its vision through three primary goals:

- Promoting Collaborative Research with Creative Technologies: Our aim is to accelerate cross-university research by harnessing creative technologies.
- Empowering the Future Workforce: Our dedication lies in nurturing the next generation of professionals. By emphasizing essential skills in interactive technologies, VR/AR, and AI, we ensure they are well-prepared for the demands of tomorrow.
- Expanding Outreach and Community Engagement: We aim to enhance outreach efforts and foster engagement within the local and regional community.

Focus Areas

At the IAC, our strength lies in the vast expertise of our core faculty, spanning from the arts such as Visualization, Dance, Theatre, and Music, to diverse fields including Education, Veterinary Medicine, Nursing, Medicine, Computer Science, Engineering, and Psychology.

To provide focus to our multifaceted specializations, we've streamlined our focus into four central themes: *Interactive & Immersive Education*, *Arts in Health and Wellness*, *Artistic Innovation through Technology*, *AI, Arts and Creativity*. These themes represent the IAC's dedication to nurturing creativity and advancing innovation across a spectrum of disciplines.

Interactive & Immersive Education

The IAC's Interactive & Immersive Education Initiative embraces cutting-edge interactive and immersive technologies to enhance educational practices across diverse fields, from scientific studies to medical and nursing training. Engaging in embodied interaction bolsters cognitive learning processes, while immersive technology significantly enhances the mastery of complex procedural tasks. The IAC collaborates with specialists from multiple domains and advances traditional education, integrating high-fidelity 3D computer graphics, haptic feedback systems, and artificial intelligence.

Highlighted Project

Creative Anatomy project: We focus on integrating interactive/immersive technology to enhance the effectiveness of learning STEM concepts, including Gross Anatomy. Dr. Jinsil Hwaryoung Seo founded the Creative Anatomy Collective for this research in collaboration with Dr. Michelle Pine and others. The team has developed virtual, augmented reality applications that encourage

Figure 1. Muscle Action VR [1]

construction and manipulation of anatomical components and integrating artistic practices into traditional anatomy curriculums.

Arts in Health and Wellness

The Institute for Applied Creativity's Arts in Health and Wellness program is dedicated to the practice of health and wellness through the arts, enhancing education, and advancing research in arts, healthcare, and education for healthier, more equitable lives for all. The group of participating faculty members' expertise includes traditional art practices, dance, music, and theater, as well as interactive art and AI. Participating faculty members have a record of applying art practices in health and wellness contexts for over a decade.

Highlighted Projects

Creative Aging: The research team has worked with local assisted living facilities, nursing homes, and senior centers, initiating a program that integrates interactive arts and crafts activities. This initiative is specifically designed to nurture the cognitive functions of older adults, foster enriching intergenerational connections, and encourage physical engagement. Our research has recently advanced to incorporate artificial intelligence and virtual reality technologies, with the aim of developing innovative reminiscing tools. These tools are designed to aid older adults experiencing memory impairment by unlocking and stimulating recollections in a supportive, engaging manner.

Figure 2. Interactive Card Activity

Interactive Touch Workshop: The research team has innovatively designed interactive soft toys and plant pots to enhance tactile experiences for those with limited access to tactile experiences. These items leverage the calming nature of touch, infusing peace and comfort into soft toys and live plants. In workshops, participants can make their own touch-responsive toys or plant systems that produce sensory feedback. Soft toys with LEDs and vibrators react to a child's touch with soothing patterns, while interactive plants respond to human contact with audio-visual displays. Feedback from workshop participants has been overwhelmingly positive. These interactive creations not only simulate the therapeutic effects of touch but also deepen the psychological benefits of connecting with textured surfaces and the natural world [2, 3].

Artistic Innovation through Technology

The Institute for Applied Creativity supports artistic exploration with advanced technology, including AI, AR/VR, and interactive technology, to cultivate artistic innovations and create new pathways for creating aesthetic experiences.

Highlighted Project

Color of Connection, Interactive Dance Performance: "The Color of Connection" represents a dynamic collaboration between the Visualization and Dance Programs within the School of Performance, Visualization & Fine Arts. This innovative performance leverages a Kinect-based camera capturing system to track the dancers' silhouettes, translating their movements into captivating interactive visualizations on a 360-degree projection screen. Audiences are immersed in a unique circular space,

Figure 3. Interactive Performance, Color of Connection

allowing them to fully engage with and enjoy the performance from all angles.

AI, Arts & Creativity

The Institute for Augmented Creativity (IAC) investigates how Artificial Intelligence can enhance creative processes in education, healthcare, and the arts. It aims to foster new viewpoints and pioneering strategies, aligning with its vision of 'AI for All' to democratize the innovative use of AI in various creative domains.

Highlighted Project

Aberrant Creativity Exhibition: Aberrant Creativity is an international, juried exhibition exploring the boundaries between our machines and ourselves. It is an opportunity for artists to challenge AI, to seduce AI into creative partnership, or lead it astray into play and joy. Visitors are invited to enter a strange new world in which artists experiment responsibly in embodiment and subversion,

invention and hacking, community and connection between the human and the machine.

Figure 4. Aberrant Creativity Exhibition [4]

Facility

VIRL (Visualization Immersive Reality Lab)

The Visualization Immersive Reality Lab (VIRL) is an innovative research and teaching space dedicated to exploring immersive interactions. It is located on the second floor of the Langford Architecture Center, Building C, providing students and faculty with a state-of-the-art environment for their explorations in immersive technology.

Figure 3. VR Testing in VIRL

Igloo 360 Studio

The Igloo Studio provides the opportunity to learn in an immersive environment with a room-scale 360-degree screen, thanks to a donation from ExxonMobil. The circular structure stretches 22.5 feet, with a height of 11 feet. Six projection screens are anchored at the top, and a cooling system regulates the temperature. About 10 people can comfortably sit inside.

Figure 2. Viewing a 360 video in the Igloo 360 Studio

Conclusion

In conclusion, the Institute for Applied Creativity (IAC) at Texas A&M University represents a beacon of interdisciplinary innovation and collaborative problem-solving. In this paper, we have showcased the IAC's diverse range of activities, from innovative research to dynamic teaching methods, and impactful community outreach. Our highlighted projects demonstrate not only the breadth of our expertise but also our commitment to addressing complex global challenges through local initiatives. We invite collaborators from various domains and disciplines to join us in our quest to sculpt a radiant future underpinned by creativity and driven by a shared vision of making a meaningful difference in the world.

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Author Biography

Dr. Jinsil Hwaryoung Seo is an interactive artist and researcher, acclaimed for her interdisciplinary approach that integrates technology, education, and health within the artistic sphere. She is an associate professor in the School of Performance, Visualization, & Fine Arts and the director of the Institute for Applied Creativity at Texas A&M University. Dr. Seo holds a PhD in Interactive Art and Technology from Simon Fraser University in Canada and an MFA in Computer Arts from the School of Visual Arts in New York. Her works explore tangible and embodied/immersive interaction, medical/nursing education, interactive performance, creative aging, and creative AI.