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My research investigates the reshaping of how individuals understand and experience private and public space through the increasing integration of Extended Reality (XR) and Artificial Intelligence (AI). These emerging media create complex "heterotopias," hybrid environments where novel, sometimes disruptive, social behaviors and cognitive shifts emerge. Building upon my tenured scholarship in community-based Interactive Digital Narrative (IDN) in XR, the next phase of my career moves beyond analyzing individual experiences to critically examine how the design and corporate implementation of these pervasive technologies generate these new spatial realities. To unpack these dynamics, I employ Walter Fisher's Narrative Paradigm and David Herman's Cognitive Narratology, understanding that narrative is fundamental to how we construct our world, in dialogue with spatial theories from Edward Soja and Henri Lefebvre. My central inquiry focuses on how we can design future XR/AI systems to foster equitable and meaningful engagement within these increasingly mediated public and private spheres to mitigate frictions while leveraging each technology's potential for positive social connection.

My comprehensive work in XR IDN with communities has demonstrated the impact of conceptual storytelling practices implemented through these perceptual technologies on how people experience their lived environments. For example, my work with Associate Professor Fernando Rochaix of Georgia State explored utilizing AR in community workshops with refugees in Clarkston, GA, to materialize their home cultures as "AR Gateways" at a designated intersection. Clarkston, just outside Atlanta, is America's most diverse community per square mile and has a refugee population representing over 55 countries. Through the workshops, refugees gained agency, asserting their active presence in the discussions about public art in Clarkton. Proficiency in AR offered refugees an alternative platform to create authentic representations of their cultures in and through the AR structures at the intersection. Though it was not implemented, a physical AR viewfinder was planned for installation and had support from the municipal government. In this instance, XR enables equitable and meaningful engagement by developing harmonious interactions between displaced groups and native Clarkston residents.

Building on this foundation, I have developed a theoretical lens that I explore through multiple methodologies. Soja and Lefebvre offer a flexible conception of space that enables design knowledge to be produced in first, perceived space; second, conceived space; and third, lived space. My narrative-situated approach recognizes how stories are told, moderated by XR/AI platforms as 'conceived space,' influences how citizens view their 'perceived space'. These two aspects of the Trialectics create a heterotopic third space wherein users make sense of these spaces (lived space). My approach frames this sense-making as cognitive narratology, how individuals construct their worlds, and Fisher's Narrative Paradigm helps to explain how these understandings cohere as narratives about spaces and places. Insights from IDN theory, from Koenitz and Murray, particularly concepts like dramatic agency and the hermeneutic interaction processes, offer valuable insights for understanding how users make meaning and how these technologically mediated spatial narratives shape belief structures. Soja, Herman, and Koentiz all recognize the processual nature of space, cognition, and narrative in meaning-making across the Spatial Trialectics. As a scholar and designer, I seek to develop answers to my research question by critically engaging with how to design those processes.

Investigating these complex dynamics necessitates a methodological framework bridging theory and practice. To this end, my work primarily employs a Research Through Design (RtD) methodology, where the creation and deployment of novel XR and AI systems serve as direct modes of inquiry into their socio-spatial and cultural impacts. My Digital Humanist approach to this work involves developing technologies that prioritize human well-being, agency, and pluralism. While my focus is primarily on digital interactions, the approach is holistic, and I consider the built environment's physical and material aspects. Accordingly, I situate this practice within a community-based participatory framework. This work is exemplified in the Clarkston project and my DWNTWN Muncie AR project, which brought community leaders and historians together to re-situate AR narratives on paved-over historical sites. In both instances, community members became active collaborators and project stewards. To derive rich insights from these engagements and understand the "lived spaces" of mediated experience, I utilize qualitative methods, including semi-structured interviews, thematic analysis, and the development of design probes related to XR/AI situated experiences. As I work in a fast-moving space, I also engage in

bibliographic research to develop insights on where critical research in the XR space occurs. For example, my current bibliographic research project highlights a crucial gap between the design knowledge created for XR in cities and rural communities. This is a disparity my future work aims to investigate and address, given its potential impact on democratic processes, societal equity, and how we understand our shared national and provincial spaces.

My research is inherently externally engaged; these principles directly translate to impactful industry collaborations. When PIKE Electric sought to develop VR training, they initially preferred headset-based experiences. However, after engaging in contextual inquiry with the utility workers, it became clear that they did not prefer putting on a VR headset around their peers. Additionally, educators noted challenges in actively engaging with learners while they were immersed in headsets. These insights led to the development of 360-degree interactive story-based training experiences of hazardous situations. Instead of using VR headsets, I situated the experiences within an existing LMS that ran on trainee iPads. This process enabled the benefits of immersive media while meeting the needs of trainees and teachers. During the pandemic, Essence Magazine reached out to develop an AR filter for their Festival of Culture, which took place in New Orleans. Appropriately cognizant of the potential risk to their attendees, the organizers wanted an AR experience that enabled those staying home to celebrate Black culture and Black Joy with those onsite. Instead of using Facebook or Snapchat to do this work, I used WebAR with 8thWall to collect and distribute augmented selfies created by all participants. This design created a lived space where everyone could join in the celebration. Lastly, working in Indiana has allowed me to bring AR skills to small and rural communities. I partnered with Snap Inc. to get trainers to local libraries throughout Delaware County. This partnership underscores my conviction that research should extend beyond the lab and studio into the hands of everyday people.

Looking ahead, there are three different research projects in which I plan to explore how future XR/AI systems can be designed to foster equitable and meaningful engagement in mediated public and private spheres to create harmonious social connections. The first is the development of an open source WebAR network that can be supported in the second space by community-governed digital platforms (conceptual space) and anchored by co-created physical markers (perceived space). The democratization of these technologies is more equitable outside the moderation of social media companies who are the primary distributors of consumer-facing XR but have not been responsible stewards of emerging technologies. Second, the design and development of XR-enhanced spaces can achieve spatial justice when physical, cultural, and social structures are considered. Building upon previous work, I seek to identify discrepancies between different community needs for location-based XR experiences, from Main Street to Harlem, integrating, not exploiting, the physical and material environment for cohesive experiences. Third, with the immediate advent of XR glasses, designing AI solutions that recognize non-users' rights to privacy and autonomy, and their rights to assemble peacefully in space is of immediate necessity. I plan to explore how computer vision and the recognition of people can constrain augmentations to create more enjoyable spaces for all.

Ultimately, my research agenda aims to produce critical design knowledge at the intersection of emerging media, spatial theory, and narrative cognition. My Digital Humanist perspective and passion for community engagement motivate my exploration of how XR and AI prompt social shifts. Further, this perspective compels me to consider how to actively shape the development of these technologies towards more equitable, meaningful, and creatively autonomous futures. I am committed to pioneering new understandings of how XR and AI reshape the human experience and to developing design paradigms that ensure these powerful technologies foster democratic engagement, social equity, and individual agency. This work will contribute significantly to scholarly discourse and the ethical practice of designing spaces and places in our increasingly mediated world.