Graduate School of Science and Technology Master's Thesis Abstract

Laboratory name (Supervisor)	Interactive Media Design (Hirokazu Kato （Professor）)		
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Thesis title	Transitional Mixed Reality Interface for Flood Risk Communication in Flood-prone Communities		

Abstract

Flood risk communication in disaster-prone communities often relies on traditional tools (e.g., paper-based and browser-based hazard maps) that struggle to engage community stakeholders and provide intuitive representations of flood scenarios. In this paper, we apply the transitional mixed reality (MR) interface concept from pioneering work and extend it to flood risk communication through co-design with community stakeholders, aiming to help vulnerable residents understand flood risks and facilitate preparedness. Beginning with an initial transitional MR prototype, we conducted three iterative workshops, each focusing on device usability, visualization techniques, and interaction methods. We collaborated with diverse community stakeholders in flood-prone areas, collecting feedback to refine the system according to community needs. We also conducted expert consultations to gather insights for future prototype development. Our preliminary evaluation indicates that this co-designed system significantly improves user understanding and engagement compared to traditional tools, though some older residents experienced usability challenges. We detail this iterative co-design process, critical insights, and design implications, offering our work as a practical case study of mixed reality applications in strengthening flood risk communication. We also discuss the system's potential to support asymmetric collaboration between municipal river management authorities and local citizens in flood preparedness.