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Reconstructing the Aural Heritage of the Historic Rochester Savings Bank

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In cultural heritage preservation, visual and architectural aspects of heritage sites are emphasized while little attention has been given to sensory and acoustic features. Because human experience is holistic, the contribution of auditory information is significant. In fact, many built environments have been specifically designed and used for conveying particular auditory information. For example, concert halls and recording studios are constructed to create pleasing acoustics for musicians and audiences. In such buildings, acoustics translate to auditory information that can uniquely identify a space. Moreover, visual information is dominant for ‘informatic’ experiences, while auditory information has been strongly associated with the ‘emotional’ aspects of those experiences, as well as with communication properties. In convincing and meaningful renderings of virtual experiences, therefore,

successful delivery of auditory importation is not supplementary, but essential.

We formed a multidisciplinary research team to develop recommendations for best practices in (1) collecting aural heritage data and (2) reconstructing the aural dimension of cultural heritage sites, with funding from the National Endowment for Humanities (NEH) Division of Preservation and Access. Our team selected three case-studies which are culturally, architecturally, and temporally distinct examples of endangered aural heritage, including a recording studio on Nashville’s historic Music Row and a UNESCO World Heritage archaeological site in Peru. Our local case-study in Rochester is an exemplar early 20th-century public space important to many community interactions, the Rochester Savings Bank (RSB) in downtown of Rochester. Listed on the National

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Register of Historic Places (NRHP), this building with a grand Byzantine-revival hall has historical significance for art, architecture and commerce.

We present three aural heritage technology demonstrations. First, we present a novel spatial audio technology called Active Field Control (AFC), which enables the virtual experience of any measured acoustical environment, with real-time sonic inputs. That means that the audience can make sound and hear their soundmaking as if they are located in the selected environment whose aural heritage has been measured and preserved in this virtual system. This AFC system can virtually transform any space into a famous concert hall, an inaccessible cultural heritage site, or even an imagined architectural environment. Next, we present a demonstration of our new scalable method for aural heritage data collection, called W-AMBISONICS. This method enables the reproduction of real-world acoustics through different audio systems ranging from headphones or earbuds to an immersive multi-channel “surround-sound” loudspeaker array. Finally, we present a virtual reconstruction of the acoustics of the Rochester Savings Bank, collected and auralized using the new W-AMBISONICS technique, reproduced as an immersive 3D audio experience through the AFC system.

All three demonstrations will take place at RIT’s Immersive Audio Laboratory (RIAL). This laboratory features a specially designed 24-channel loudspeaker array that can render a three-dimensional (3D) soundfield for immersive auditory imaging, and a 250-degree wrap-around screen for congruent visual rendering with extended horizontal field-of-view (FOV) coverage (120°) to provide the audience with a seamless audio-visual experience.