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It's Right Behind You!: Sound Object Depth Perception in Modern Horror Film Soundscapes

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ABSTRACT

Within the past few decades, horror film sound design has evolved to include spatial audio systems such as Dolby Atmos to place sound objects within three dimensions. Through examination of the relationship between sound object depth, spatial localization, and human perception, this study explores how modern horror films utilize spatial audio to enhance horror experiences. By analyzing spatial positioning, impulse response manipulation, and production techniques within binaural and periphonic configurations, this research examines how spatial horror soundscapes influence audience immersion. Quantitative analysis of spatial parameters such as azimuth, elevation, and directional measurements along with response time to external stimuli will be combined with empirical assessment of audience perception to quantify spatial audio placement techniques. Case studies will be used to measure audience immersion, examining the efficacy of spatial horror sound objects within various speaker configurations. Anticipated results include quantifying spatial audio methodologies within the horror genre through technical analysis, in particular sound depth localization in regard to danger proximity within film and formulating an analytical framework to analyze spatial horror implementation. This research strives to contribute statistical and empirical data through subjective testing on the influence of spatial audio placement to audience immersion and perception in modern horror films. The outcomes will present guidelines for film sound designers interfacing with spatial

audio systems, providing research-based methods for creating immersive and psychologically impactful horror soundscapes through accurate three-dimensional sound object placement.

ABOUT THE PRESENTERS

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Nathan Ash-Milby is a graduate student at Indiana University Indianapolis focusing on sound design technologies. He is interested gaining industry experience and academic research. Ash-Milby is a musician, piano instructor, and recently began sound editing for an art and culture podcast. He earned a Bachelor of Music from the University of North Texas in 2022. As an undergraduate he was a performer in the UNT Concert Band, the Green Brigade Marching Band and member of the Men's Choir. He was vice president of the fraternity, Beta Gamma Omega, a member of the Native American Student Association, and an ambassador for the UNT Student Alumni Association. Ash-Milby played synthesizer for the Concord Blue Devils Drum and Bugle Corp in the Drum Corps International (DCI) during their 2019 world championship season. He is a member of the International Computer Music Association and an active member of Music Portland, an independent music industry organization. Ash-Milby is a proud descendent of the Navajo Nation, who grew up in Maplewood, NJ and currently lives in Portland Oregon.

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Dr. Timothy Hsu is an Assistant Professor in Music and Arts Technology (MAT) at Indiana University Indianapolis, is the Graduate Program Director for Music Technology, and leads the Musical Acoustics Lab. Dr. Hsu received a B.M in Piano Performance and in Recording Arts and a M.A in Acoustics from the Peabody Institute of the Johns Hopkins University. He also received a M.S. and a Ph.D. in Mechanical Engineering from Georgia Tech. Prior to IUPUI, he was a Visiting Assistant Professor at the Georgia Tech School of Music and Center for Music Technology and was the Georgia Tech Chorale director. His research area spans vocal acoustics, musical acoustics, and architectural acoustics. Recent projects include work with diffusers and shape grammar, music technology and STEM education, and health applications of acoustics. Additionally, he is a member of the Acoustical Society of America and Audio Engineering Society.