

Binaural and Beam-forming Auditory Delivery Systems for Mission Critical Contexts

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Abstract—Persistent problems with the use of headphones and traditional wide-diffusion speaker systems for auditory display have prompted military, vehicular, control room, emergency, medical, conferencing and other experts to consider using alternative means of delivering auditory information in a variety of communications environments, including high-stress and mission critical contexts. The expanding use of 3D imagery and massive, networked displays adds complexity and multidimensionality to these issues. Specifically, listener fatigue, intelligibility, multi-source tracking, user interface, and integration with multiple or massive visual displays and

VR systems are all factors that fail to various degrees in traditional audio delivery systems. Availability of small transducers, low power/high efficiency amplifiers, inexpensive and powerful DSP chips, and advanced acoustics modeling software enable experimentation with a variety of audio delivery modalities that have resisted cost-effective or portable solutions in the past. Human factors engineering, psychoacoustics and perception science, combined with new or reconsidered technological solutions suggest that significant gains may be possible in the near future. The author will demonstrate several experimental auditory delivery modalities using new hardware and software developed at UCSD/CalIT2.