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How scene attributes and sound influence visual exploration of omnidirectional panoramic scenes

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Abstract

As virtual reality devices get more widespread, investigating how humans explore omnidirectional panoramic scenes has become a topic of interest. Several computational models now exist for predicting visual saliency in such environments. However, the existing literature largely ignores auditory cues while estimating saliency maps. To pave the road for more capable models, here, we ask how scene attributes and sound categories influence visual exploration. Considering a dataset of omnidirectional videos of dynamic scenes and eye fixations collected with and without sound, we analyzed how different semantic factors affect eye movement behavior; whether there are significant differences across human, animal, or music sounds present in the videos, or for indoor or outdoor scenes. Analyses revealed that the regulatory effects of audio in human fixations significantly increase in indoor scenes or if the audio is of music but decrease in outdoor scenes or if the audio is of animal or human sounds.