CSE 493V VR SYSTEMS

BINOCULAR RIVALRY: SENDING DIFFERENT IMAGES TO EACH EYE

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PROBLEM

What happens when we are given complete control over what images are sent to each eye? We can generate robust, programmatic illusions which harness the splicing of binocular images performed by the brain, and observe the qualities of the resulting perceived binocular images.

RELATED WORK / MOTIVATION

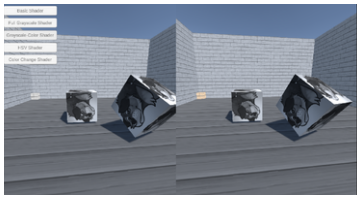
Previous work in this area has attempted to use rivalry as a stimuli to draw attention to specific objects in the scene (Krekhov et al.). Binocular rivalry and the stitching together of almost identical images has also been used to improve the perceived contrast of images, despite the physical limitations of a headset (Zhong et al.).

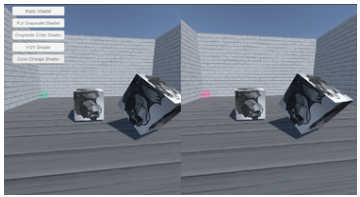
YOUR APPROACH / SOLUTION

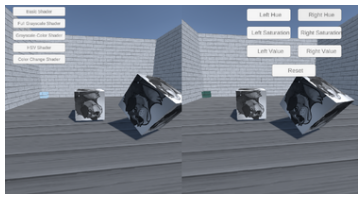
In this project, we explored different ways to induce binocular rivalry and the effects this had on user-perceived images.

METHOD / PIPELINE / ALGORITHM / PROCESS

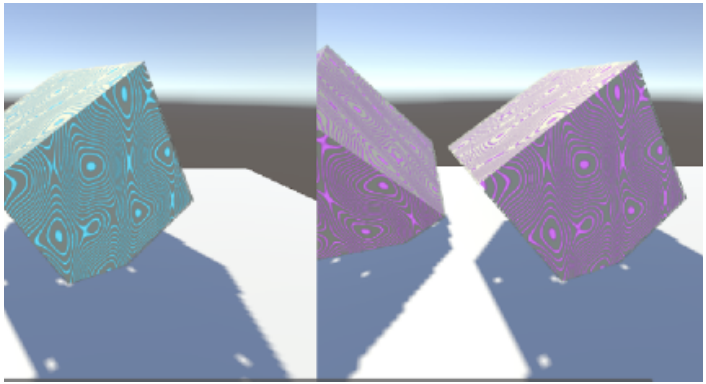
We wanted to implement a variety of different stereo shaders in order to best test how humans respond to different forms of binocular rivalry. We created a grayscale-color stereo shader, a HSV adjustment stereo shader, and a color overlay stereo shader.







RESULTS



One interesting finding we had was that changing the color overlay of objects in the right and left eye led to the object looking shiny, and almost iridescent. After experimenting with multiple colors, we found cyan and magenta to be the most aesthetically pleasing combination.

REFERENCES

(Krekhov et al.) Deadeye: A Novel Preattentive Visualization Technique Based on Dichoptic Presentation, https://www.cs.rpi.edu/~cutler/classes/visualization/S20/papers/deadeye_2019.pdf

(Zhong et al.) DiCE: Dichoptic Contrast Enhancement for VR and Stereo Displays, https://www.cl.cam.ac.uk/research/rainbow/projects/dice/