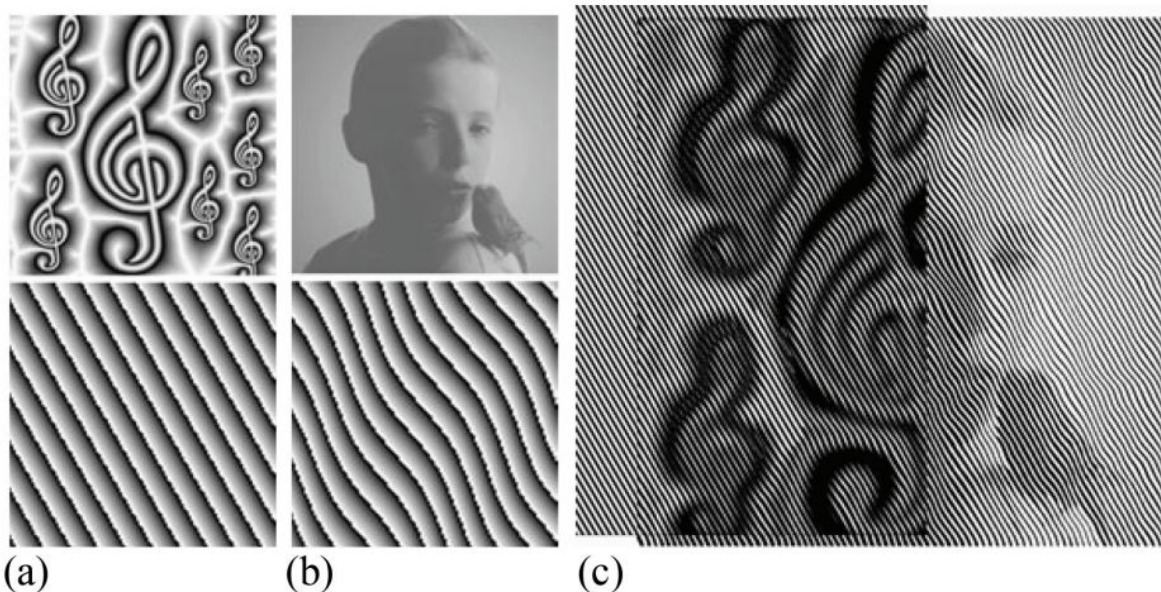


Light field imaging to enable band Moiré level artwork

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Our project aims to obscure and reveal hidden scenes and objects in a picture, based upon the principles of Moiré level lines and aliasing. Chossen & Hersch [1] propose the mathematics and examples of animated, beating shapes hidden in Moiré level lines based upon a simulated elevation profile of the object. Rather than virtually generate the scene to encode, we propose the use of a Kinect time-of-flight camera to gather the depth map of a scene in real time. Additionally, we'd like to explore the use of two LCD panels for the banding images. One would have the backlight removed and just be a transparency mask. At the demo & poster session, we would allow users to capture a scene with the camera and move the mask over the display to reveal the hidden scene. Here's an example of the expected result:



Here's our proposed methodology:

1. Use a Kinect to capture the depth map of an object we wish to obscure with the Moiré pattern.
2. Use image to generate depth map of single frame, based upon Jeon et. al. [3].
3. Convert depth map to Moiré pattern, as proposed in [1], [2].
4. Generate corresponding Moiré banding transparency, [2].
5. Display the pattern on the screen and use a second LCD panel to display the mask. Users can move the 2nd panel over the display to reveal the hidden image.

Just as a sidenote, no android device will be required for this project. We plan to have a demo at the poster presentation with band artwork and the corresponding transparencies.

3+ references

[1] Chosson, Sylvain M., and Roger D. Hersch. "Beating shapes relying on moiré level lines." *ACM Transactions on Graphics (TOG)* 34.1 (2014): 9.

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[2] Hersch, Roger David, and Sylvain Chosson. "Band moiré images." *ACM Transactions on Graphics (TOG)*. Vol. 23. No. 3. ACM, 2004.

- <http://lspwww.epfl.ch/publications/moire/bmi.pdf>

[3]: Jeon, Hae-Gon, et al. "Accurate depth map estimation from a lenslet light field camera." *2015 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. IEEE, 2015.

- http://www.cv-foundation.org/openaccess/content_cvpr_2015/papers/Jeon_Accurate_Depth_Map_2015_CVPR_paper.pdf