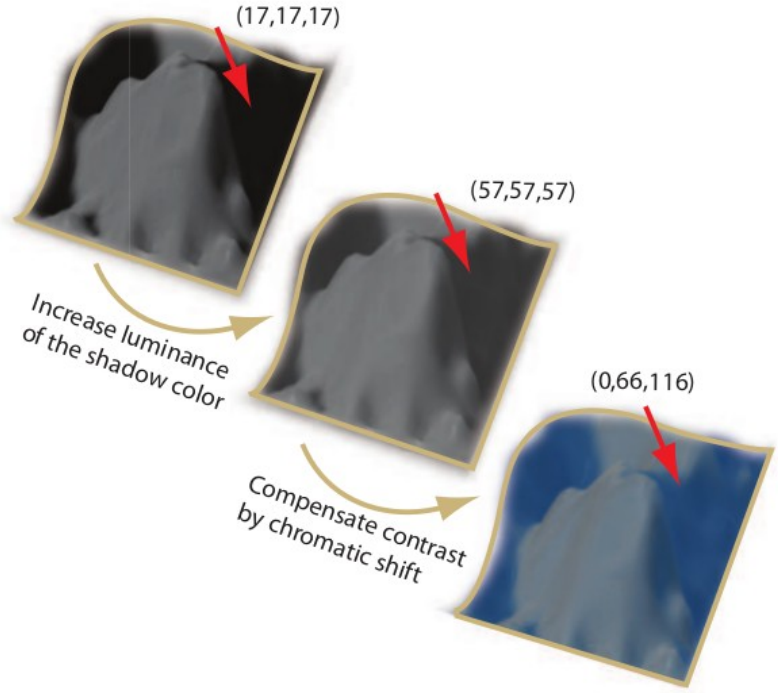
Chromatic Shadows for Improved Perception explores the idea of preventing the loss of information that occurs in case of conventional shadow mapping techniques. Solteszova et al, inspired by the works of renowned artists of the past, such as da Vinci, take an approach of assigning a color to a shade. The technique developed can significantly reduce the overdarkening while retaining al the depth and shape cues. The typical application of this technique are scientific visualizations.

The paper describes a parameter called **shadowiness**, which is a product of convensional shadow mapping techniques. This parameter is then mapped to a color and a blend factor via the **shadow transfer function**. Through an extensive evaluation of the technique, the authors also suggest optimal shadow color values by providing distances in LAB color space.

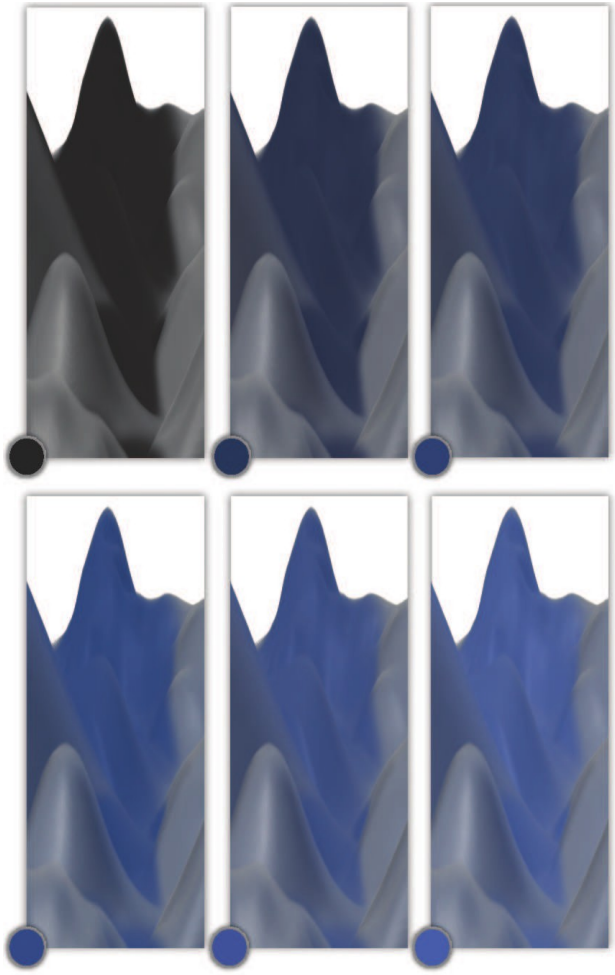
$$C^S{}_A : f(S) \rightarrow C^S{}_{RGB}$$
$$C_{RGB} = (1 - C^S{}_A) C^0{}_{RGB} + C^S{}_A \, C^S{}_{RGB}$$

The method further involves increasing the luminance component of the color and then performing a chromatic shift to increase the contrast. The procedure is illustrated by the figure below.



The evaluation of the method was carried out though three tests: surface perception, constrast perception and depth perception, each for different tone of shadow color. For surface perception, each subject was asked to position the gauge figure (normal vector and disc at tangent) so that it's normal is aligned with surface normal at given point. For the second test, subjects were asked to enlarge apertures at given points until they could notice a contrast. Finally, subjects were asked to estimate depth at three given points in three cases of black shadow, blue shadow and no shadow (only phong shade). Overall, in each test, the approach descussed was given the most favourable

scores (leat amount of error). It became apparent that grater chromatic shift results in lesser magnitude of error.



References

Veronika Šoltészová, Daniel Patel, and Ivan Viola. 2011. Chromatic shadows for improved perception. In *Proceedings of the ACM SIGGRAPH/Eurographics Symposium on Non-Photorealistic Animation and Rendering* (NPAR '11), Stephen N. Spencer (Ed.). ACM, New York, NY, USA, 105-116. DOI=10.1145/2024676.2024694 http://doi.acm.org/10.1145/2024676.2024694