Depth-Dependent Halos: Illustrative Rendering of Dense Line Data

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Abstract—This supplemental document contains a number of high-resolution result images of the method described in the paper and is designed to be printed on a 1200 dpi laser printer or better. Two versions of this document are available: one with normal black-and-white images and one with anaglyphic images, which is designed to be viewed with red-cyan or red-green glasses (the red filter used for the left eye). For the best viewing experience of both the supplemental material and the paper on the screen, we recommend to enable the option "smooth images" in Acrobat Reader's "Page Display" preferences dialog and to disable the option "Use 2D graphics acceleration" in the same dialog.

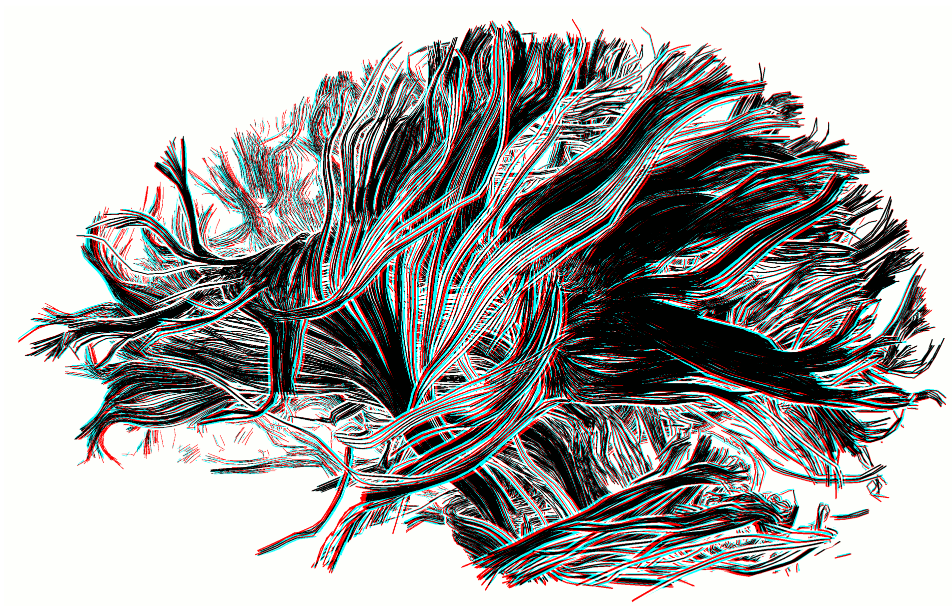


Fig. 1. Illustrative visualization of a subset of DTI fiber tracts in a human brain. Note the emphasis of compact fiber bundles and how the "fanning out" of these is clearly visualized with depth-dependent halos. The dataset comprises 11 306 tracts and 260 836 vertices.

Fig. 2. Illustrative visualization of a subset of DTI fiber tracts in a human brain, same dataset as in Fig. 1 but showing different view (from below).

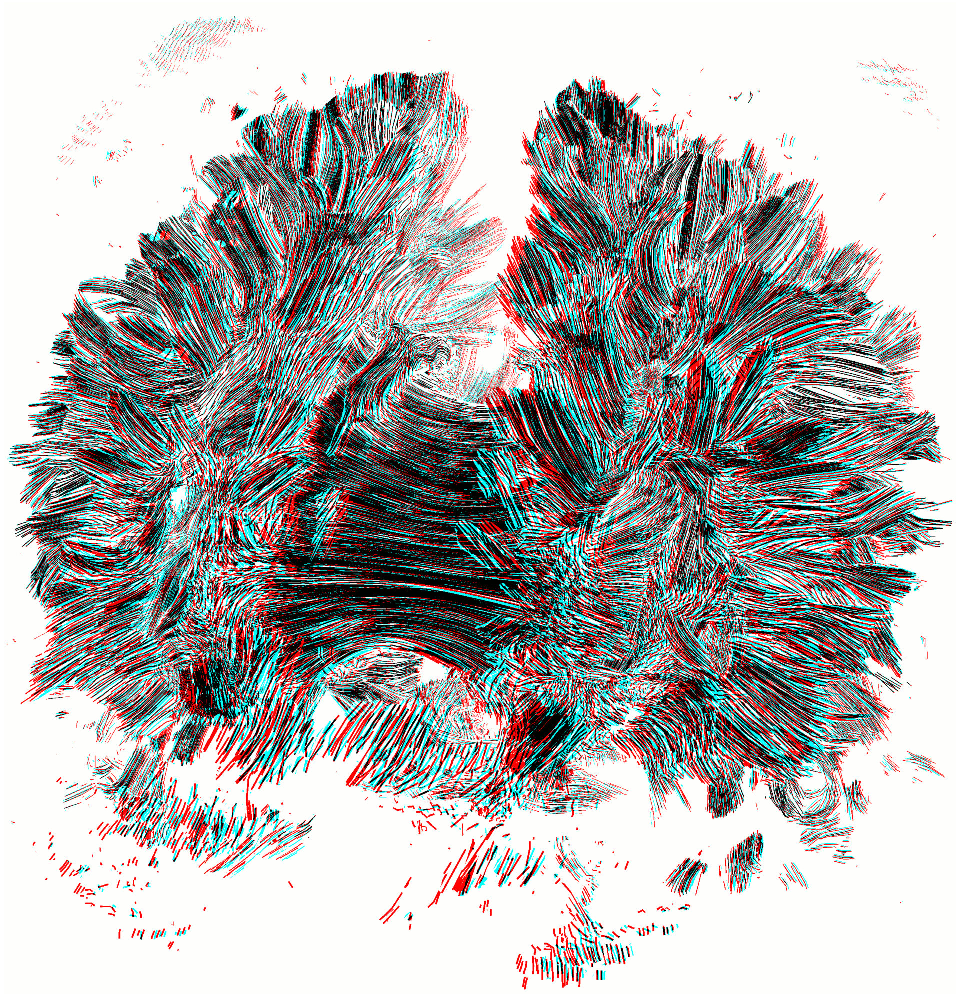
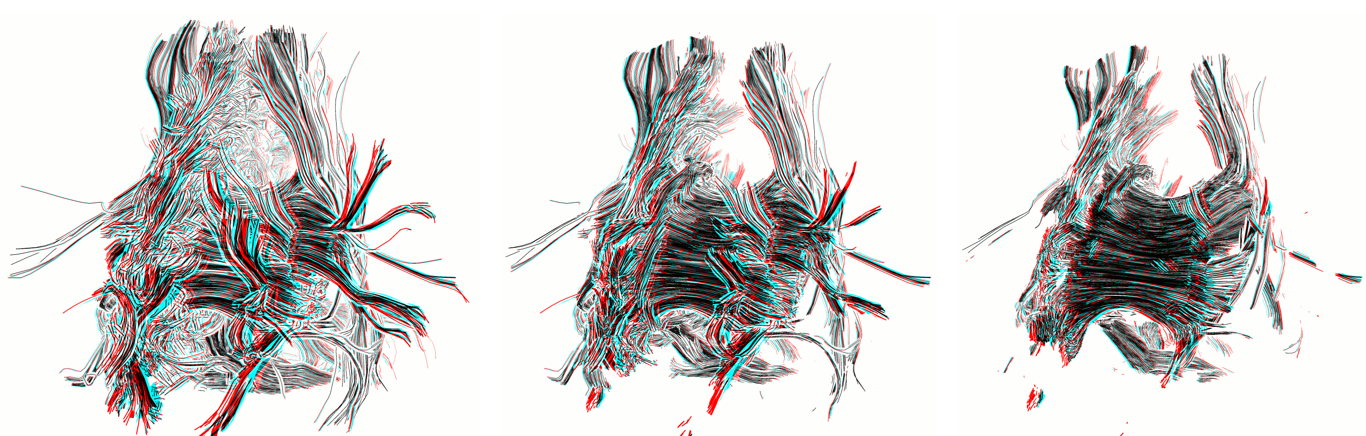
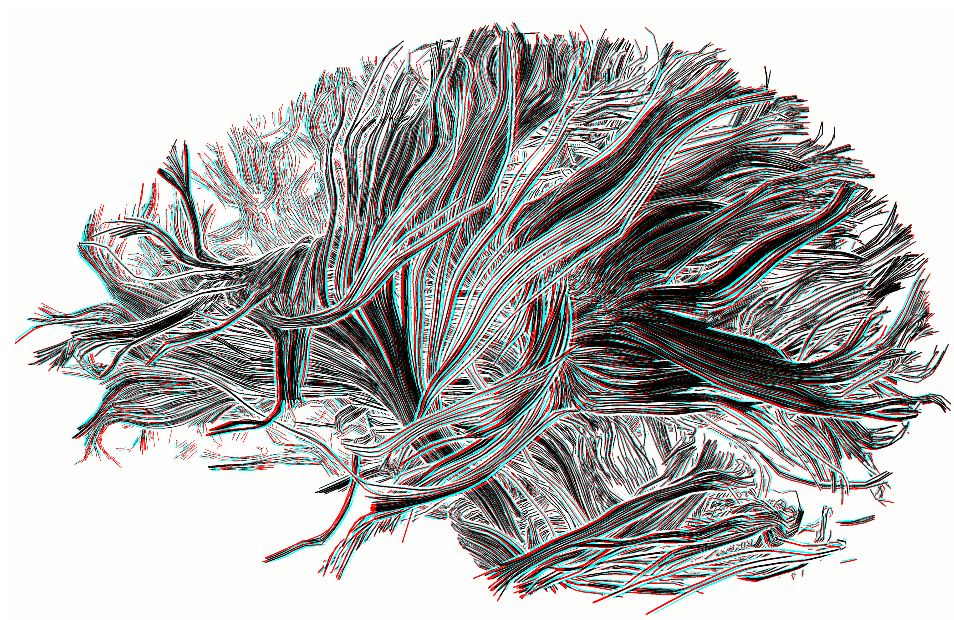


Fig. 3. Illustrative visualization of dense set of fiber tracts extracted from a DTI dataset of a human brain, filtered by fractional anisotropy. The full (unfiltered) dataset uses 150 352 tracts with 1 625 472 vertices.



(a) (b) (c)

Fig. 4. Three example stages of filtering, using the fractional anisotropy (FA) value of a DTI fiber tract dataset. With the growing filtering threshold for FA, more of the internal structure of the dataset is revealed. Same dataset as in Fig. 1



(a) $f_{\text{displacement}}(x) = x^2$

(b) $f_{\text{displacement}}(x) = \sqrt{x}$

Fig. 5. The effect of using nonlinear displacement functions. The result is either (a) less emphasis on the bundles but more detail within each bundle or (b) even more emphasis of the bundles but less detail within each bundle. Same dataset and view as in Fig. 1.

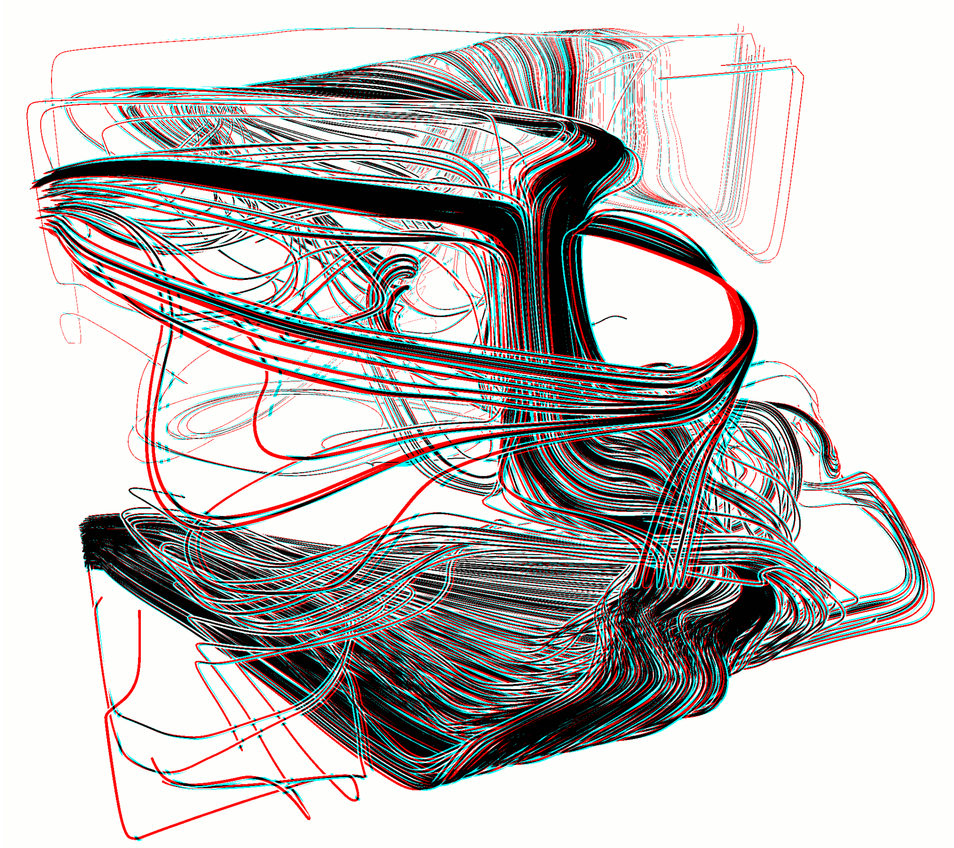


Fig. 6. Illustrative visualization of streamlines showing air flow in an office, using VTK's "office" example dataset from which 786 streamlines and 278 849 vertices were extracted using VTK. Notice how the halos enhance the perception of the depth relation of the lines.

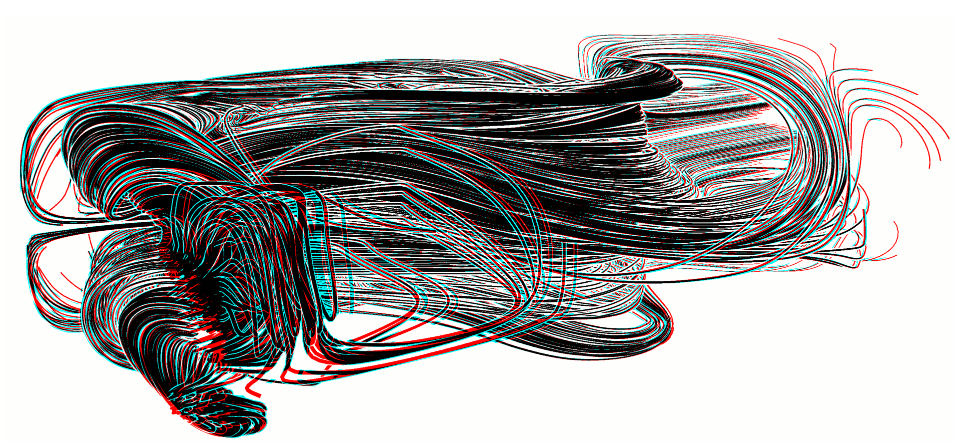


Fig. 7. Illustrative visualization of streamlines showing water flow. The dataset uses 1 400 streamlines and 2 603 605 vertices and was generated using VTK.

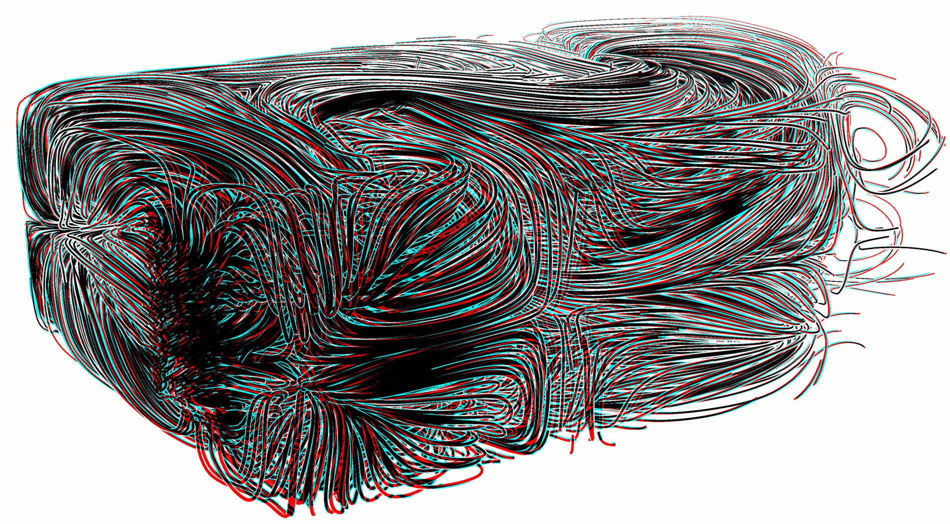


Fig. 8. Illustrative visualization of water flow with streamlines. This dataset is based on the same 3D vectorfield data as in Fig. 7, but here 4 475 streamlines were extracted comprising 7 910 911 vertices in total.

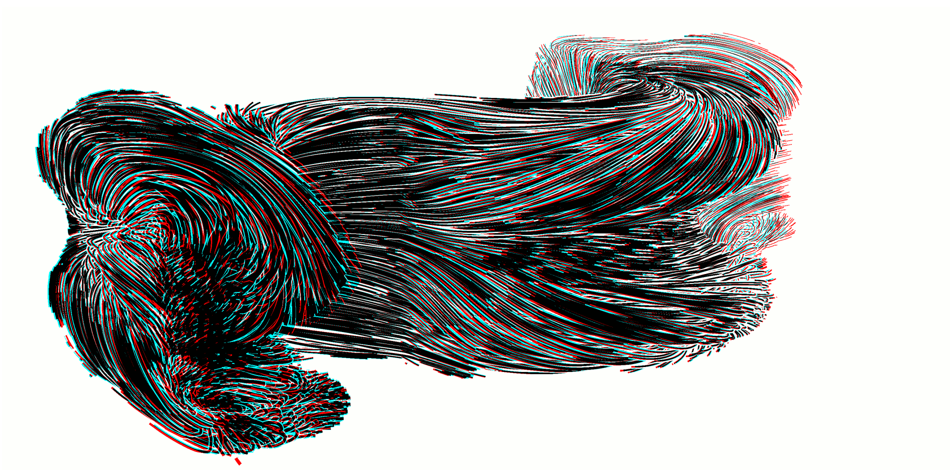


Fig. 9. Illustrative visualization of water flow, filtered on the vector field's velocity magnitude, showing only streamline sections where the velocity is high. Same dataset and view as in Fig. 8.

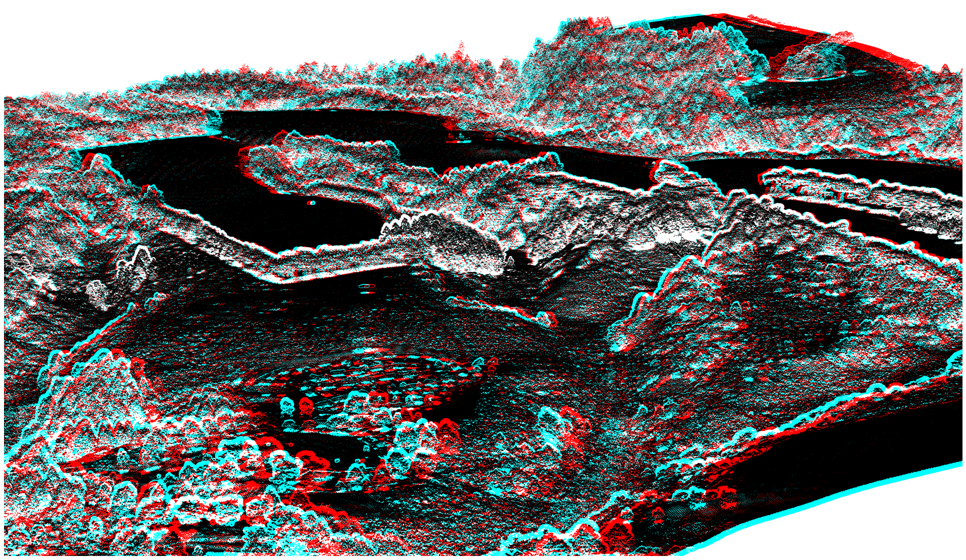


Fig. 10. Illustrative visualization of an elevation dataset with 4 440 900 points, rendered using points with halos. Note the trees being visible due to the halo effect, either as rows of trees (center and right) or even as individual trees (bottom left).

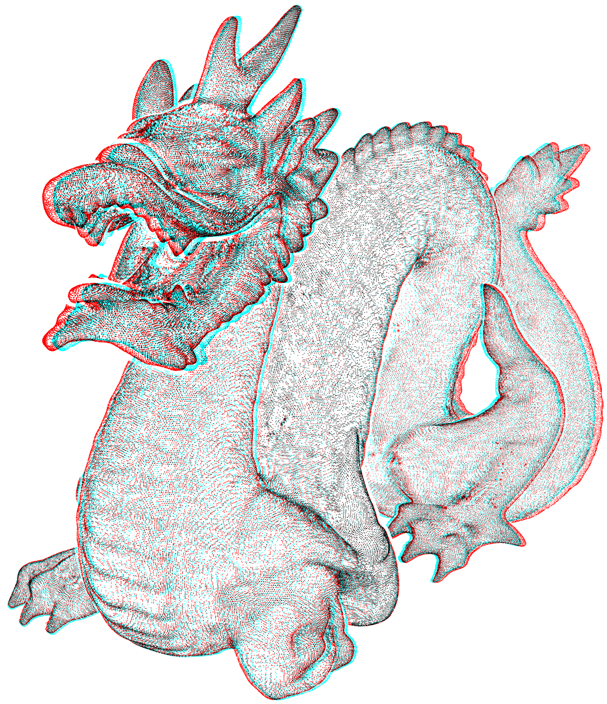


Fig. 11. Point dataset with 437 645 points representing the surface of a 3D shape. Notice the effect of visually separating contiguous regions of points at depth discontinuities.

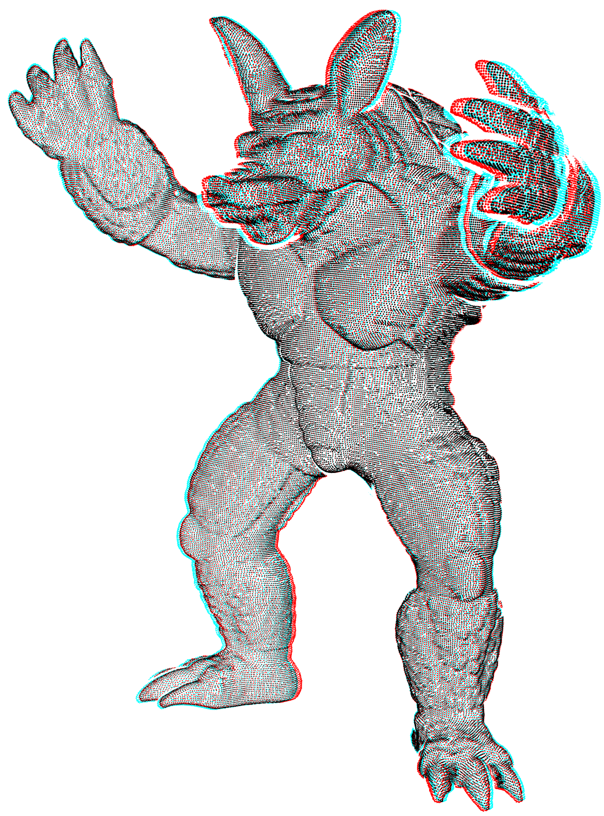


Fig. 12. Point dataset with 172 973 points representing the surface of a 3D shape. Notice the effect of visually separating contiguous regions of points at depth discontinuities.