



# PLI Viewer

RWTH Aachen University

 Interactively explore 3D-Polarized Light Imaging scalar and vector fields

## TECHNOLOGY DESCRIPTION

PLI viewer is a tool enabling interactive exploration of 3D-Polarized Light Imaging data. It provides slice-wise and volume rendering of the raw scalar data, and utilizes standard glyph and streamline tracing methods for visualizing the nerve fiber orientation vectors. Due to the massive size of the datasets, PLI viewer leverages parallel rendering and compute techniques including a remote raytracing mode for high quality geometry and volume rendering.

**Provides high quality volume rendering of raw transmittance and retardation data as well as glyph and streamline visualizations of the fiber orientation vectors**

**Includes post-processing tools for computing 2D polar plots and 3D fiber orientation distribution functions**

## AREAS

3D-Polarized Light Imaging | Scientific Visualization

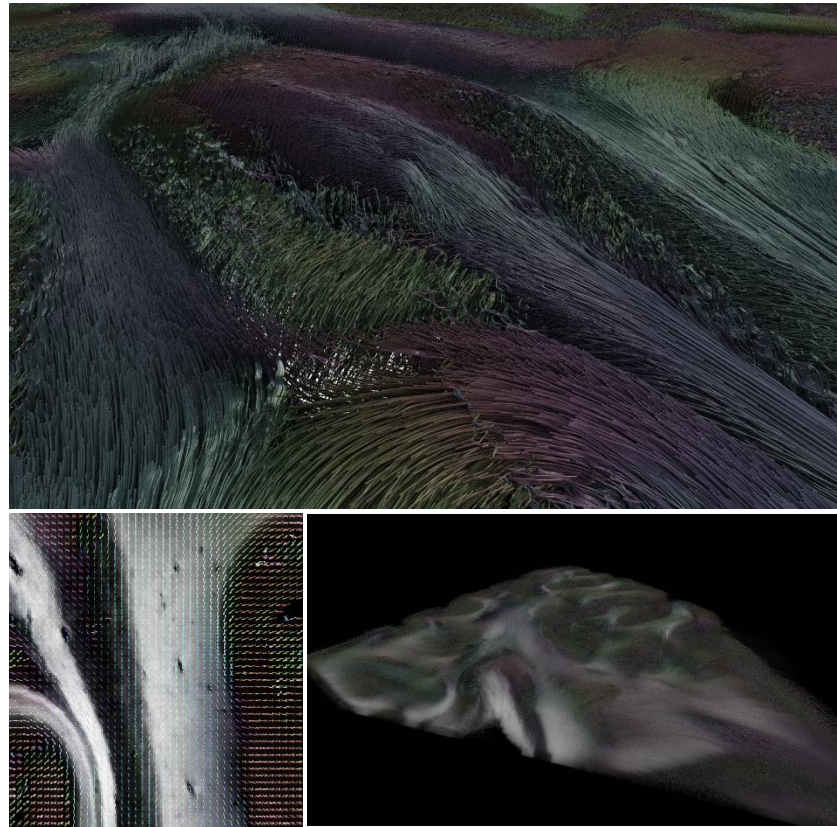






## COMPETITIVE ADVANTAGES

- Enables visualization of ultra-high resolution scalar and vector datasets obtained from 3D-Polarized Light Imaging.
- Interactively select, browse and process microscopic fiber orientation data.
- Provides adaptations of common diffusion-weighted magnetic resonance algorithms, such as fiber orientation distribution estimation and streamline tracing to PLI.
- Beginner-friendly user interface, in contrast to standard scientific visualization tools.
- Leverages high-performance compute through remote geometry and volume rendering to display massive datasets.



PLI Viewer enables interactive visualization and post-processing of 3D-Polarized Light Imaging data

## APPLICATION & MARKET POTENTIAL

- **Structural connectivity research:** interactive exploration of the architecture of the brain in micrometric resolutions using a variety of scientific visualization algorithms to understand brain structure in both healthy and pathological conditions.
- **Validation of clinical imaging methods:** voxel-wise comparison of PLI to diffusion magnetic resonance imaging for validation of current standards for clinical diagnosis.
- **Educational and clinical reference:** high-resolution 3D reconstructions of human and animal central nervous systems, serving as a reference to medical students and clinicians.

## TECHNOLOGY READINESS LEVEL



## REFERENCES

- In collaboration with Forschungszentrum Jülich, Institute for Neuroscience and Medicine – Structural and functional organisation of the brain (INM-1).
- Code available on request at [devhub.vr.rwth-aachen.de/VR-Group/pli\\_vis](https://devhub.vr.rwth-aachen.de/VR-Group/pli_vis).

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