

# FP BIOIMAGE: A NEW ONLINE TOOL FOR SHARING AND VISUALISATION OF VOLUMETRIC DATA

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**KEY WORDS:** Volumetric visualisation, 3D-imaging, open data, publication tool, sharing online, open source

New popular microscopy techniques, such as selective plane illumination microscopy (SPIM), structured illumination microscopy (SIM) and optical projection tomography (OPT), as well as many other 3D bioimaging modalities (MRI, CT, etc.) generate terabytes of volumetric data. It is now possible to image whole organs and even animals at single-cell resolution to produce so-called digital embryos. Whilst highly specialised software packages are available for the analysis and visualisation of such data, their use requires specialised skills and they are often costly. Furthermore, their capacity to share data is limited and there are no means for interactive exploration of the data by third parties.

Here we present FP Bioimage [1], an easy-to-use and powerful open-source visualisation tool that permits researchers to share their volumetric image data online and for third parties to interact with, and explore, datasets in their entirety. It can be downloaded for free at <http://fpb.ceb.cam.ac.uk>. FP Bioimage provides the viewer an immersive experience for the exploration of complex 3D bioimaging data, and makes use of the latest graphics capabilities embedded in all modern web browsers so that no additional software installation is required.

The tool is fast and user responsive, requires no training for use, and includes advanced rendering and data manipulation capabilities. Data can be intuitively explored from a ‘first person perspective,’ akin to navigating virtual space in modern computer games, allowing users to conceptualise and contextualise details in the data to aid biological interpretation.

From a researcher’s perspective the tool now makes it possible to easily share volumetric imaging data globally, providing anyone full and interactive access to the data via a web browser. In future, we hope that this changes the way research data are shared and suggest that publishers will use the software for online publication. Data can thus be shared in their entirety, moving on from the current practice of providing selective views or movies shown from a single perspective, which are not capable of providing a full understating of the data.

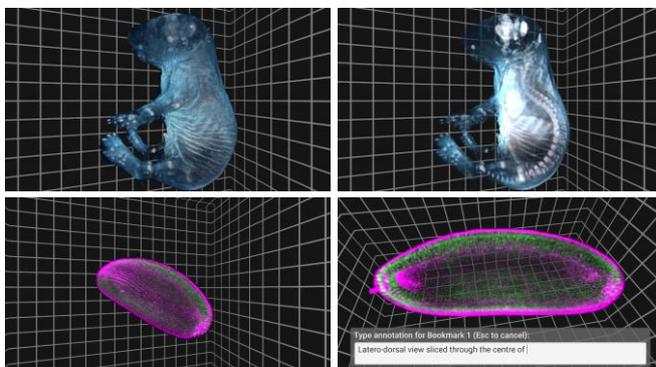


Figure 1: Screenshots of FP Bioimage displaying (a-b) four-colour OPT data of a mouse embryo [2] and (c-d) two-colour light-sheet microscopy data of a drosophila embryo

[1] M. Fantham, C.F. Kaminski, “A new online tool for visualization of volumetric data,” *Nat. Photonics*, **11** (2017). *In press*

[2] J. Sharpe, *et al.*, “Optical projection tomography as a tool for 3D microscopy and gene expression studies,” **296**, 541-545 (2002).

[3] R. Chhetri, *et al.*, “Whole-animal functional and developmental imaging with isotropic spatial resolution,” *Nat. Methods*, **12**, 1171-1178 (2015).