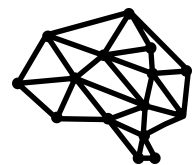# Interactive 3d Visualization in Jupyter

Maarten A. Breddels

Scipy 2018

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Agenda

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- History/Why ipyvolume?

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- Future

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  - Easiest to install software on the planet: pip install ipyvolume

Status

- Mayavi: X3D

- Matplotlib

- yt (next talk)

- plotly (now as ipywidgets!)

- itk-jupyter-widgets

- K3D-jupyter

- pythreejs (ipywidgets)

    - No plotting lib, scene graph library, becoming the 'backbone' of 3d viz for Jupyter

- unray: unstructured tetrahedral meshes

- Ipyvolume

Why use it?

- Interactive in the Jupyter notebook

  - camera: zoom, rotate

  - jupyter-widget/ipywidgets: bidirectional communication

- Interactive out of the notebook

  - Static html: ipv.save('myplot.html')

- Performance

  - Scatter plots up to 1,000,000 points

  - Animations in shaders

- Bring code to the data / viz to the client: Jupyter

  - Zero setup, no remote OpenGL

"Never do a live demo"
-Many people

Future

- 0.5+

  - pythreejs integration (Vidar Tonaas Fauske)

    - Control of camera, lights, fog, materials, animations

    - Take any pythreejs mesh and put it in ipyvolume

  - Multivolume rendering (Casper van Leeuwen)

  - Order independent transparency (Casper van Leeuwen)

  - ipyvolume+unray?

- GSOC: Oleh Kozynets

  - MNE-Python (Magnetoencephalography)

- Other languages

  - Now JVM: Java, Scala, Groovy, Clojure (beakerx)

  - Future: C++ (QuantStack, xwidgets + xeus)

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