brainglobe: Add to BrainGlobe's data visualisation tool (David Ruiz)

Personal details

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- **Zulip username:**
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- **Location & time-zone:**
  Arahal, Seville, Spain / GMT+2

- **Personal website / project portfolio:**
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- **Code contribution**
  https://github.com/brainglobe/cellfinder/pull/508

Project proposal

Synopsis
This project will extend brainrender-napari by adding a widget that lets users download and visualize publicly available atlas-registered brain data (from mouse and fish) directly in Napari. The new widget will simplify data access for non-programmers while integrating smoothly with existing BrainGlobe tools. This enhancement will lower barriers and broaden the use of advanced brain data in neuroimaging research.

Implementation timeline

Minimal Deliverables:

- **Napari Widget:** A plugin widget that allows users to browse, download, and visualize selected atlas datasets.
- **Testing:** Automated tests for key functionalities (data retrieval, visualization, error handling).
- **Documentation & Demo:** Updated user documentation and a short blog post or final report with usage examples.

12-Week Timeline (25–30 hrs/week):

- **Weeks 1–2:** Review the brainrender-napari codebase, set up the environment, and design the widget interface. Identify example atlas datasets (mouse and fish) and implement basic data retrieval.

- **Weeks 3–4:** Complete the widget functionality for downloading and displaying atlas data in Napari. Write unit tests to ensure correct data mapping and error handling.

- **Weeks 5–6:** Optimize performance, refine the user interface, and finalize documentation and demo materials. Prepare the blog post or final report to showcase the new feature.

Communication plan:

I will maintain clear and regular communication with my mentors and the BrainGlobe community throughout the project. This will include **weekly video calls** with mentors to discuss progress and next steps, as well as **daily updates** or check-ins on the project's Zulip channel. I plan to share **weekly progress summaries** (highlighting completed tasks and any challenges) and will push code frequently to the GitHub repository so mentors can track development in real time. If any urgent issues or blockers arise, I will promptly reach out for ad-hoc discussions to resolve them. This communication strategy will ensure transparent, timely collaboration and keep the project on track over the 6-week period.

Personal statement

- **Past experience**

I have several years of Python programming experience and am in my final year of Computer Engineering at the University of Seville. I've contributed to BrainGlobe projects like Cellfinder and have recently explored Napari plugin development, which gives me a solid foundation for building user-friendly visualization tools.

- **Motivation: why this project?**

I am driven by a passion for **making neuroinformatics tools more accessible** and intuitive for researchers. Often, powerful brain mapping and visualization libraries (like brainrender) remain out of reach for scientists who lack programming skills – and I find it highly motivating to bridge that gap. This project excites me because it sits at the intersection of neuroscience and user interface design: by creating a GUI widget for atlas data, we empower biologists and neuroscientists to explore complex brain data with just a few clicks. I believe that enabling broader access to atlas-registered data will accelerate discoveries and learning in the community. Being part of this effort is inspiring to me, as it means contributing to **open science** in a very tangible way – turning sophisticated computational tools into something that any researcher or student can use easily. The opportunity to help push BrainGlobe's mission forward, by uniting advanced data with an intuitive interface, motivates me to give my best to this project.

- **Match: why me?**

My background in Python, open-source contributions, and recent hands-on experience with Napari uniquely position me to deliver this project. I excel in creating intuitive, reliable software solutions and am committed to clear, well-documented code. I'm confident that I can integrate the new widget seamlessly and enhance the BrainGlobe ecosystem.

- **Availability**

I have arranged a vacation from June 27 to June 29, and no other engagements are scheduled during that period.

GSoC

- **GSoC experience**

I expect to obtain hands-on experience on a real project and on the open-source community

- **Are you also applying to projects with other organisations in GSoC 2025?**

No, all three projects that I'm applying to belong to NIU. My preferences in case I get selected in more than one would be:

1st → Improve cellfinder's classification algorithm
2nd → cellfinder support for two-dimensional brain images
3rd → Add to BrainGlobe's data visualisation tool