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How to use EBRAINS atlas services with the online Siibra Explorer and Siibra Python tools

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siibra is a software tool suite that implements a multilevel atlas of the brain by providing streamlined access to reference templates at different spatial scales, complementary brain parcellations maps, and multimodal regional data from different sources which is linked to brain anatomy at different spatial scales. It addresses interactive exploration via an interactive 3D web viewer (siibra-explorer) and integration into data analysis and simulation workflows with a comprehensive Python library (siibra-python), supporting a broad range of workflows for anatomists, experimentalists and computational neuroscientists with varying experience levels, from beginners to those with a solid background in Python.

This session offers participants an immersive opportunity to explore the advanced tools and techniques for data analysis and visualization. We will briefly introduce the tool suite and highlight its features and benefits. Participants will learn to access 3D reference templates and maps, including anatomical, and connectivity atlases. We will interactively explore BigBrain cytoarchitectonic maps and cortical layer segmentation and extract region-specific information via the EBRAINS Knowledge Graph.

Moving beyond the graphical interface of siibra-explorer, the session will proceed with siibra-python. Participants will be guided through coding exercises demonstrating how to fetch brain region maps, access the BigBrain dataset, and extract multimodal regional features such as cortical thicknesses, cell and neurotransmitter densities, gene expressions, connectivity data, as well as AI-generated feature representations of cytoarchitectonic organization.

After completing the training, participants will have a first insight of the features of siibra-explorer and siibra-python to enhance their ability to explore brain atlases and perform advanced neuroimaging analyses.

Requirements: A laptop with an up-to-date web browser (Chrome or Firefox is recommended) is required for the hands-on examples. All examples will be run on pre-built Jupyter notebooks, which will be provided for downloading. Please register for an EBRAINS account in advance.

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