DARE25-046 - Open BrainTrawler: Towards an interoperable, accessible and self-hostable neuroscience tool

Abstract

Understanding the brain in all its complexity is essential for medical, social and economic reasons. Currently, we are moving to a post-experimental and data-sharing period of neuroscience for scientific, ethical and sustainability reasons. At the same time, technical and computational advances like spatial transcriptomics and AI bring new opportunities to generate and to mine experimental data. To balance these aspects, new experiments should be carefully planned, their results should be published and contextualized with existing data. However, this essential connection of diverse datasets and their interpretation in relation to one other is technically complex. To free neuroscientists from the technically demanding task of integrating public datasets from multiple sources and modalities, we at VRVis GmbH developed the web-based data exploration tool BrainTrawler with our data resource BrainTACO, publicly available via https://braintrawler.vrvis.at. We aim to improve our tool and contribute to making neuroscience more FAIR by (1) opening our API and developing a Python package for accessibility and interoperability (e.g. with BrainGlobe), (2) fostering the community aspect by allowing compatible preparation and integration of own data to BrainTrawler to visualize and analyze it in context of the integrated public data and (3) simplifying local installation of BrainTrawler to make access more user-friendly, low-threshold and privacy preserving. Through improved access to our tool, we aim to enable a broader community of neuroscientists, biologists, pharmacologists and psychiatrists to set their experimental data in context with public datasets and to do multi-modal analysis to understand the brain despite having limited formal mathematical and computational background. Thereby, we aim to support researchers to increase the knowledge about the brain in health and disease and speed up drug discovery.

Scientific disciplines:
Brain research (80%) | Pharmacy (20%)

Keywords:
neuroscience; drug target discovery; visual analytics software

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Further links to the persons involved and to the project can be found under
https://www.gmbh.wwtf.at/funding/programmes/ei/DARE25-046/