Human Brain Project Summit 2023

Science Market

Palais du Pharo, Marseille
28-29 March 2023

SCIENCE MARKET INTRODUCTION

Booths

Booth #1 - EBRAINS Data & Knowledge Services for Fair Neuroscience Data, Models and Code
Booth #2 - EBRAINS brain atlases and tools for exploration, integration & analysis
Booth #3 - EBRAINS Modelling and Simulation Workflows
Booth #4 - Closed-Loop Neuroscience, AI and Robotic Workflows
Booth #5 - EBRAINS Computing Services: The Medical Data Analytics
Booth #6 - Showcasing EBRAINS
Booth #7 - EBRAINS Simulation Services: The Virtual Brain
Booth #8 - HBP Partnering Projects and Vouchers
Booth #9 - EBRAINS Community, High Level Support, Education & Training
Booth #10 - Ethics & Society
Booth #11 - HBP Innovation
Booth #12 - EBRAINS Computing Services: Neuromorphic Computing
Booth #13 - EBRAINS Computing Services: HPC, Cloud, Storage & Network Services of the Fenix Infrastructure
Booth #14 - EBRAINS Computing Services: The Collaboratory
Booth #15 - EBRAINS Computing Services: Health Data Cloud
Booth #16 - EBRAINS Research Infrastructure - Central Hub and National Nodes

Additional presence

Science Vision Paper (presented by Nataliia Fedorchenko)
WP1 Comics (presented by Constanza Rojas-Molina)
Max Planck School of Cognition

Location

Espace Vieux-Port, Floor -3
Palais du Pharo
53, Boulevard Charles Livon
13007 Marseille, France

EBRAINS DATA & KNOWLEDGE SERVICES FOR FAIR NEUROSCIENCE DATA, MODELS AND CODE

EBRAINS Data and Knowledge services advance neuroscience research and discovery by providing online solutions for FAIR research products (e.g., research data, computational models and code). To achieve this, EBRAINS provides an expert-driven database system (**Knowledge Graph**) managing over 1000 research products in accordance with a common metadata framework (**openMINDS**). In addition, EBRAINS offers the publication of **Live Papers**, interactive supplementary documents that can complement journal publications. The publication of research products in the Knowledge Graph and the publication of Live Papers is supported and guided by domain experts of the **EBRAINS Curation Service**. Neuroscientists looking to share their research products to make them more FAIR will find the EBRAINS Data and Knowledge services as a mature, human supported, and globally connected research portal

What will you find at the booth?
Demos of tools and workflows, Posters, Video tutorials, Hand-outs, Quizzes

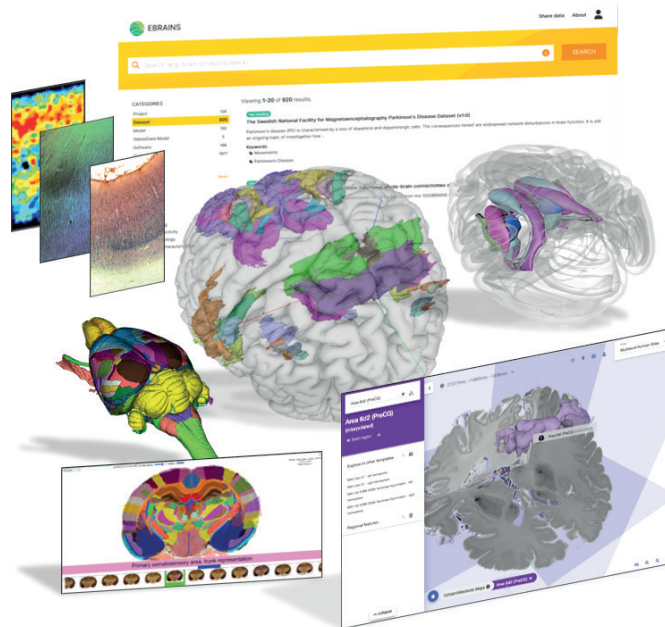**Keywords:**
#DataSharing #CurationService #FAIRdata

Find out more:
https://ebrains.eu/services/data-and-knowledge

EBRAINS BRAIN ATLASES AND TOOLS FOR EXPLORATION, INTEGRATION & ANALYSIS

EBRAINS Atlas services provide the scientific community **open access 3D atlases** for the **human, macaque, mouse and rat brain**. Brain regions can be explored at microscopic detail in **interactive viewers** and **programming libraries**, and used to discover related **multimodal data features** from the EBRAINS Knowledge Graph and other repositories. In addition, we offer a range of **tools and workflows** connected to the atlases, enabling **integration of user data** to make them available in a **common spatial framework** for **reuse** and **quantitative analysis**.

What will you find at the booth?
Demos of tools and workflows, Posters, Video tutorials
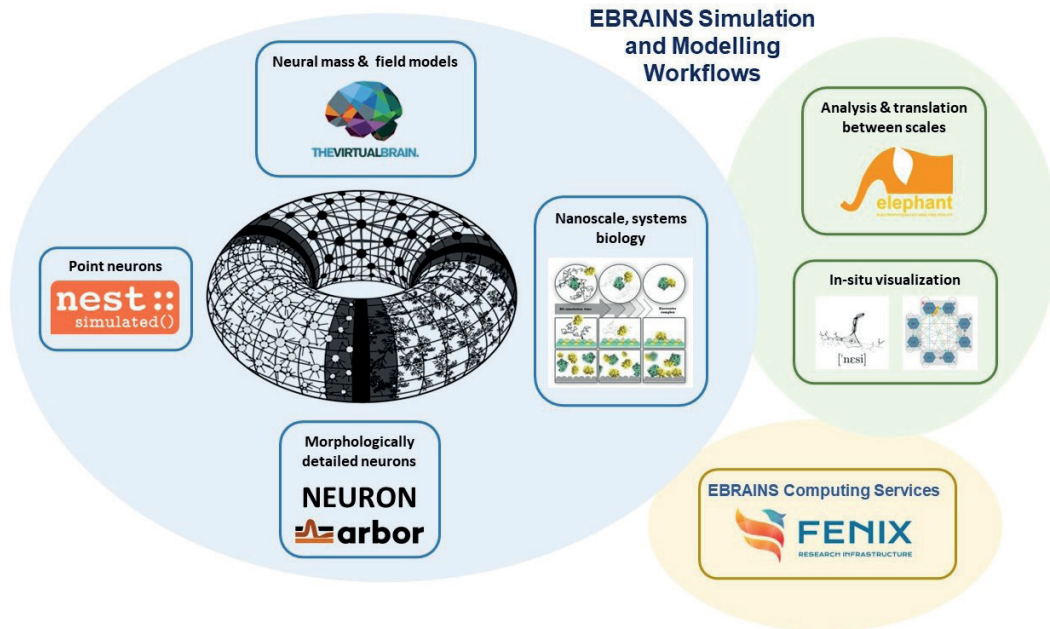
Keywords:
#BrainAtlasing #Atlases #BrainRegions

Find out more:
https://ebrains.eu/services/atlases

EBRAINS BRAIN MODELLING AND SIMULATION WORKFLOWS

In research, simulation acts as the main conduit for interchange between experiment and theory. It is a powerful instrument in our endeavour to understand the human brain, which is a complex dynamic system with a multi-scale architecture, further complicated by significant differences between one person's brain and another's. EBRAINS Simulation services offer technical solutions for brain researchers to conduct sustainable simulation studies and build upon prior work, and the means to share their results. The services provide integrated workflows for model creation, simulation and validation, including data analysis and visualisation. The simulation engines cover the entire spectrum of levels of description ranging from molecular to (sub-)cellular to network to whole brain level.

What will you find at the booth?
Interaction with simulation tool owners and live demos of simulation tools and workflows, giveaways like flyers, stickers etc., posters, videos & SC3 presentation on screen

Keywords:
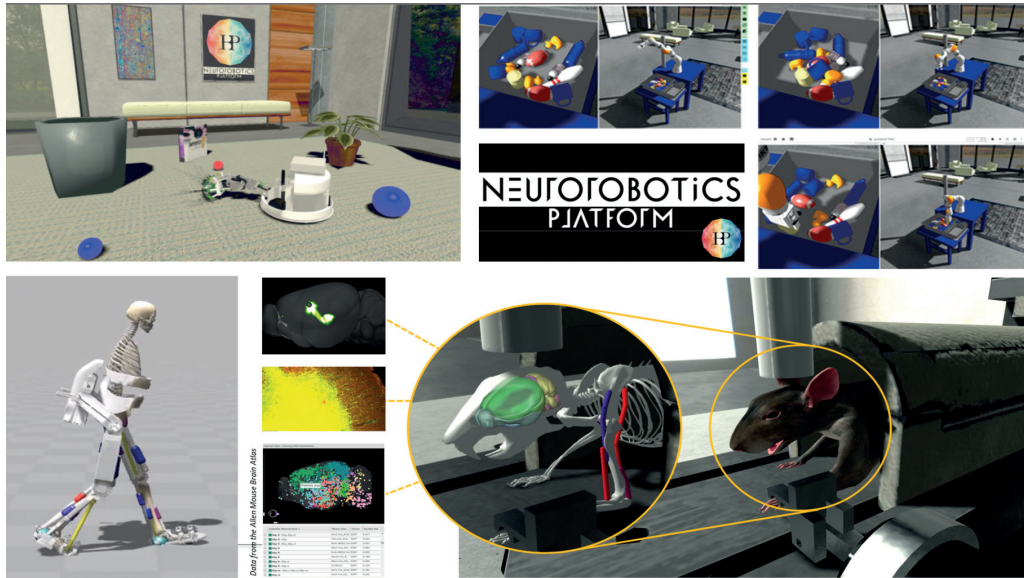#Simulation #Visualisation #BrainModels #DataAnalysis

Find out more:
https://ebrains.eu/services/simulation

CLOSED-LOOP NEUROSCIENCE, AI AND ROBOTICS WORKFLOWS

The HBP Neurorobotics platform is the backbone of the EBRAINS Closed-Loop Neuroscience service. It provides access to an online, physically realistic environment within which users can simulate and use neural models (including spiking neural networks running on neuromorphic chips) composed into functional architectures, connected to physical incarnations (musculoskeletal models, robotic systems). This service allows cognitive and computational neuroscientists to explore, in an embodied setting, connections between neural models considered (their structure), their dynamical behavior (activity), and function. It provides roboticists direct access to cutting-edge neuroscience research, with the tools to investigate efficacy of functional neural models in addressing problems in robotics and embodied AI.

What will you find at the booth?
Demonstration of online integration of NEST desktop with NRP; NRP based simulation of musculoskeletal modes of actions of the HERO system and exo-skeleton; videos, demos, flyers

Keywords:
#Neurorobotics #AI #NeuralModels

Find out more:
https://ebrains.eu/service/neurorobotics-platform

EBRAINS COMPUTING SERVICES:
THE MEDICAL DATA ANALYTICS

The Medical Data Analytics Service: share and re-use health data to accelerate progress in clinical neurosciences.
The Medical Informatics Platform – MIP: privacy-preserving, federated data processing and analytics system for the federation of anonymized large clinical datasets and research cohorts.
The Human Intracerebral EEG Platform -HIP): privacy-enabling environment for state-of-the-art processing and international sharing of human intracerebral EEG (iEEG) data.

What will you find at the booth?
Demos of tools and workflows, posters, video tutorials, Flyers, Posters, videos & SC5 presentation on screen
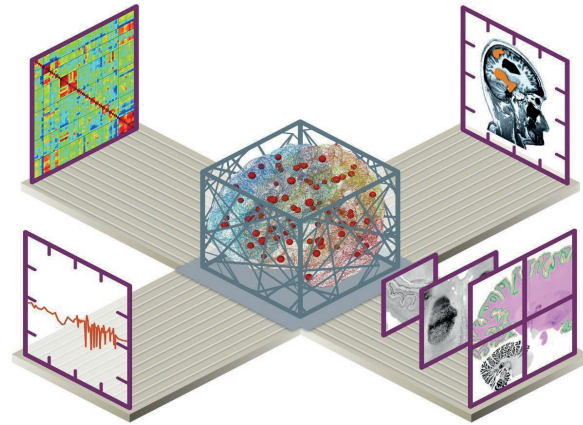
Keywords:
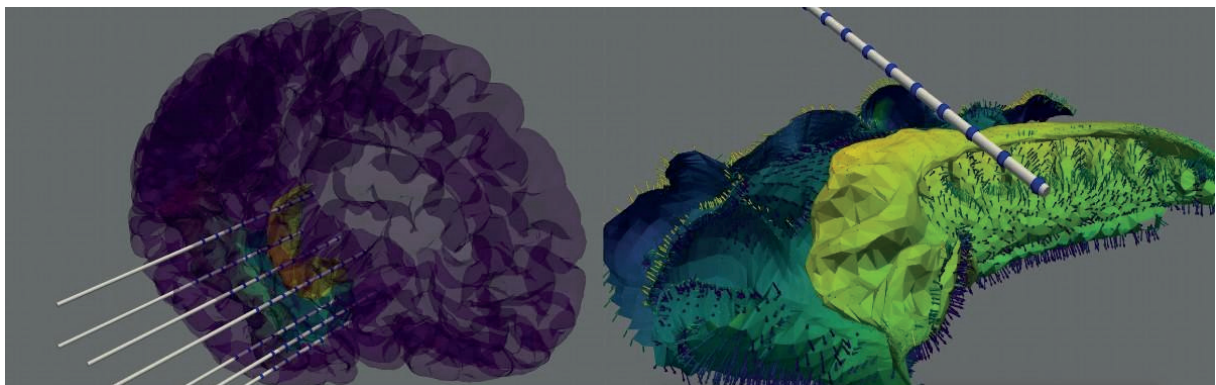#Medicaldata #ClinicalData #MedicalInformatics

Find out more:
https://ebrains.eu/services/medical-data

SHOWCASING EBRAINS

**SC1:** Novel insights into brain aging mechanisms through building a virtual brain cohort, integrating 1000BRAINS dataset, use of EBRAINS' multilevel human brain atlas, and The Virtual Brain simulator.


SC2: EBRAINS-enabled advance in personalised medicine through the transition to high-resolution The Virtual Brain simulator. Highlights include progress in high-resolution and multiscale brain simulation for epilepsy.

SHOWCASING EBRAINS
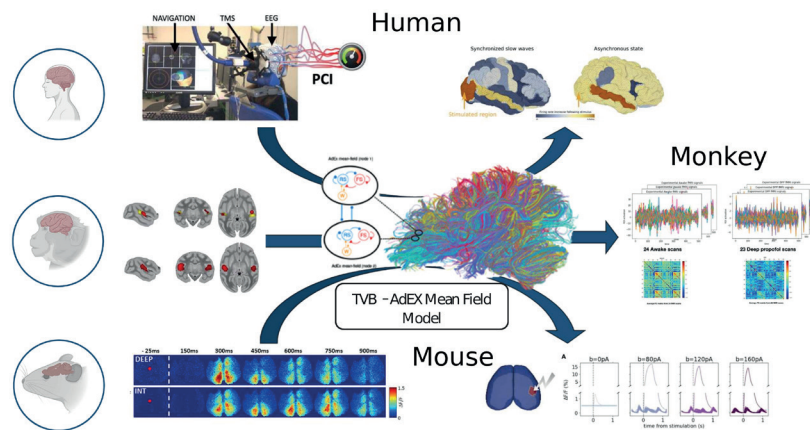
SC3: By integrating the EBRAINS-based Adex model in The Virtual Brain (TVB), Showcase 3 explores brain activity, bridging microscopic parameters to whole brain dynamics, during both conscious and unconscious states.
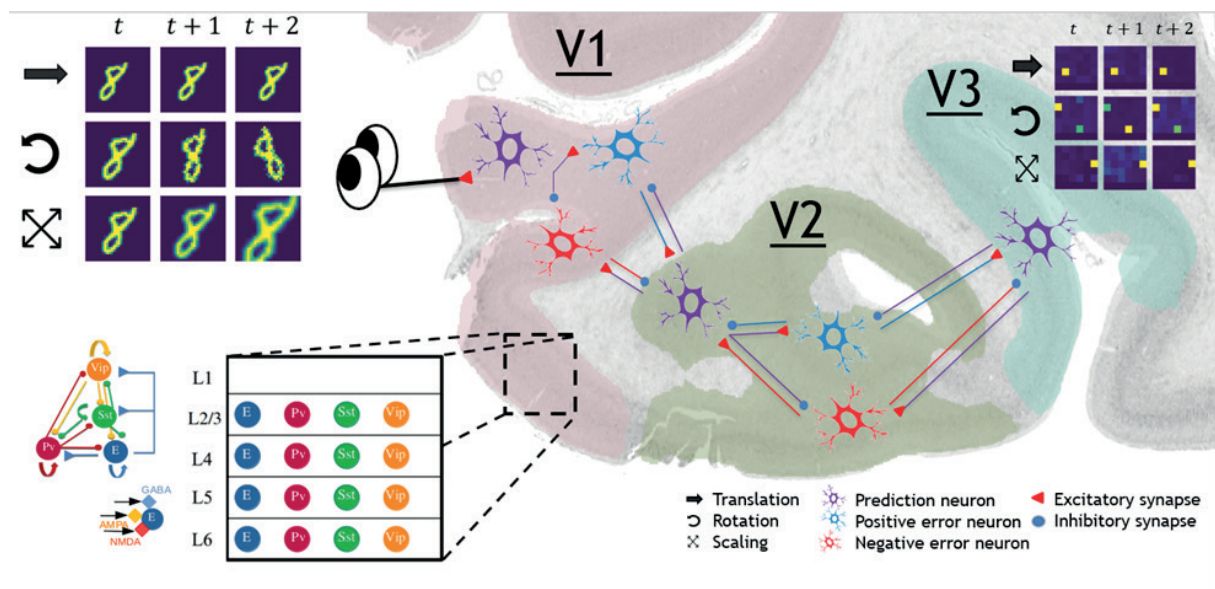
SC4: Based on neurophysiological evidence, the predictive coding models constructed in Showcase 4 investigate the mechanics of generative visual perception.

SHOWCASING EBRAINS
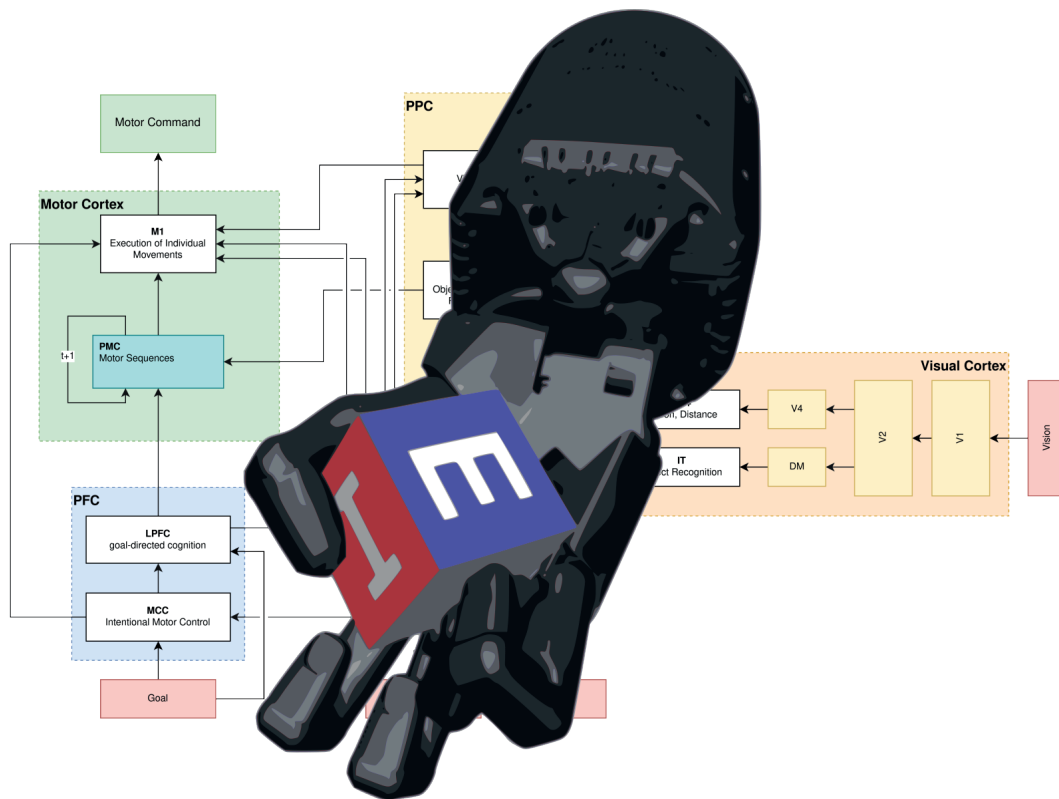
SC5: Using goal-driven deep learning, Showcase 5 builds a brain model controlling an anthropomorphic hand to study the neurocomputations underlying human dexterity.

SHOWCASING EBRAINS

SC6: By interfacing multiple HBP-developed modules, Showcase 6 demonstrates how their interactions can be used to perform tasks relevant to industry.

What will you find at the booth?
-Showcase 3: Demo's and movies;
-Showcase 4: movies and interactive simulations, visual illusions;
-Showcase 5: demo's, QR codes to Jupyter notebooks (interaction with computer, smaller desks);
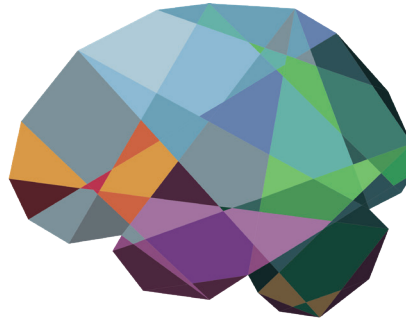-Showcase 6: Supercomputer power needed; live demonstrations, videos, presentations, images, simulation

Keywords:
#ShowcasingEBRAINS #Modelling #Simulation

Find out more:
https://www.humanbrainproject.eu/en/science-development/scientific-achievements/showcases/

EBRAINS SIMULATION SERVICES:
THE VIRTUAL BRAIN

THEVIRTUALBRAIN.

The Virtual Brain (TVB) is a free, open-source neuroinformatics software for constructing and simulating personalized brain network models, and generating sufficiently accurate (S) EEG, MEG, and BOLD signals.

TVB is the choice of whole-brain simulator in EBRAINS RI. The Virtual Brain integration in EBRAINS ecosystem offers scientists cloud services, including a variety of prepackaged modules, integrated simulation tools, pipelines, and data sets for easy and immediate use on EBRAINS.

TVB-on-EBRAINS allows users to have an end-to-end experience of personalized brain model creation and multi-scale brain simulation, using high-performance computing in the cloud.

TVB Cloud services also implement state-of-the-art security mechanisms like encryption, access control and sandboxing to protect personal data, while at the same time workflows can be flexibly and reproducibly modified using containerized applications. This makes it possible to process large-cohort databases, which in turn makes it possible to produce generalized results - a precondition for being able to use these results to develop potential medical treatments, therapies, or diagnostic procedures.

Join the growing userbase of clinicians and scientists working every day with TVB!

What will you find at the booth?
Demos: TVB-on-EBRAINS, TVB use-cases, TVB application on tablet

Keywords:
#DigitalBrain #BrainSimulation #BrainNetworkModels

Find out more:
https://ebrains.eu/service/the-virtual-brain

HBP PARTNERING PROJECTS AND VOUCHERS

Come to our booth to learn more about the Partnering Projects and Voucher recipients of the Human Brain Project!

The Partnering Projects have performed research, innovation and networking activities in the fields of neuroscience, medicine, and technology. They added new knowledge, competencies, ideas and resources to the Human Brain Project, and benefited from the EBRAINS Research Infrastructure and the other capabilities made available by the HBP.
HBP Vouchers gained access to the HBP infrastructure services and with the help of its engineers, the voucher winners implemented new infrastructure capabilities to solve specific problems not covered by the current Research Infrastructure toolset.

At the booth, Partnering and Voucher Projects will present their scientific achievements, discuss and answer any question regarding their projects with the visitors.

What will you find at the booth?
Partnering Project Posters, Partnering & Voucher Project Figures and Achievements, flyers from different projects, goodies

Keywords:
#PartneringProjects #VoucherProgramme #Synergies

Find out more:
https://www.humanbrainproject.eu/en/collaborate-hbp/partnering-projects/

EBRAINS COMMUNITY, High Level Support, Education & Training

EBRAINS Community

Human Brain Project Education Programme

Come by and learn more about how we can support you in connecting to the HBP & EBRAINS! The Community, High Level Support and Education Teams are looking forward to informing you about the EBRAINS Community, user support and documentation activities as well as education and training opportunities.

EBRAINS Community
Whether you are looking for other EBRAINS users, would like to engage in research facilitated by the EBRAINS services and tools, or find elements of neuroscience and brain-related technology fascinating, the odds are you will find like-minded individuals in the EBRAINS Community. Ask all your questions at our booth and learn more about the Community and upcoming co-create activities.

High Level Support
The High-Level Support Team helps users to make the best out of EBRAINS by ensuring easy access to tutorials and documentation for EBRAINS offerings and by providing individual support to users, ranging from fixing small hick-ups to onboarding and user-initiated improvements. Chat with us about your experience with our documentation and tutorials as well as your support needs.

Education & Training
The HBP Education Programme has accompanied the Human Brain Project over its 10 years and offers innovative learning packages and education event opportunities for early career researchers working in and across fields of neuroscience, medicine and ICT. In addition, the HBP E-Library offers a vast collection of lectures and video material from past HBP Education Events.

EBRAINS Community, High Level Support, Education & Training

What will you find at the booth?
Explanations on the EBRAINS Community Space, the HLST activities and the HBP Education Programme, flyers, posters, videos, HBP fortune wheel, goodies

Keywords:
#EBRAINScommunity #Support #EducationProgramme

Find out more:
Community: https://ebrains.eu/service/ebrains-community
High-Level Support: https://ebrains.eu/support/
Education & Training: https://www.humanbrainproject.eu/en/education-training-career/education-programme/

ETHICS & SOCIETY

For a decade, we have facilitated the embedding of responsible research and innovation (RRI) practices in the Human Brain Project by providing governance structures, capacity building and social, ethical and reflective research on everything from good RRI practice, data governance, dual use, public engagement, diversity, neuroethics and philosophy. In this booth, you will meet researchers to discuss how to conduct interdisciplinary brain research responsibly, anticipating, identifying and addressing the ethical and societal implications of this type of work. You will also learn about our scientific publications, the tools we developed for responsible research and innovation, equality, diversity and inclusion in project themes and teams, and our online capacity-building resources.

What will you find at the booth?
Meet & Greet during breaks in a format called the „Ethics & Society café" - programme under development. Rollups promoting 3 online resources: The Ethics & Society Toolkit, the EDI toolkit for Equality, Diversity and Inclusion in Project Themes and Teams and the HBP Ethics & Society training resources

Keywords:
#RRI #Equality #Diversity

Find out more:
https://www.humanbrainproject.eu/en/science-development/ethics-and-society/

HBP INNOVATION

The booth will present the work made by the HBP Innovation team to support the transferring of the HBP research mature results to the scientific and industrial markets. The booth will facilitate practical connections between HBP researchers and neurotechnology stakeholders, including investors looking for great research ideas to finance and support. We will also give on-site support and solve researchers' doubts on questions related to technology transfer and innovation.

What will you find at the booth?
Studies, reports, technology sheets

Keywords:
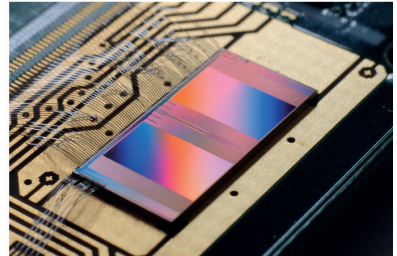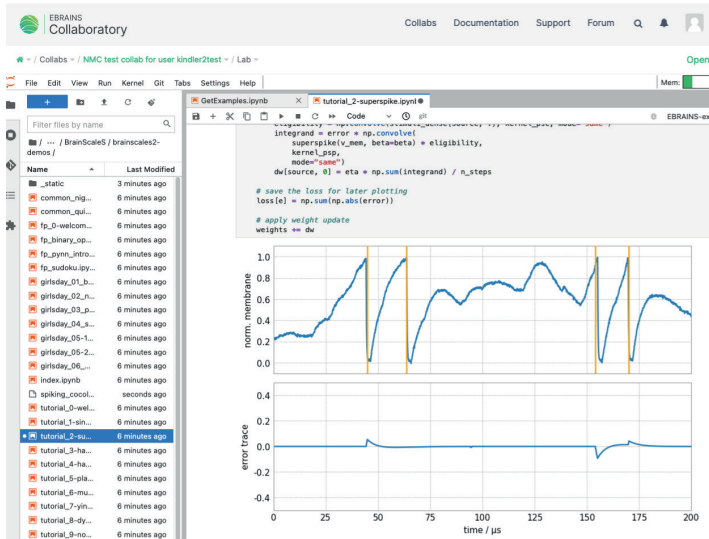#Innovation #Industry #TechnologyTransfer #TechnologyRoadmaps

Find out more:
https://www.humanbrainproject.eu/en/collaborate-hbp/innovation-industry/

EBRAINS COMPUTING SERVICES: NEUROMORPHIC COMPUTING

https://ebrains.eu/service/neuromorphic-computing/

Interactive Neuromorphic Computing on SpiNNaker and BrainScaleS for research and education.

What will you find at the booth?
Neuromorphic computing: online interactive access
Material: NMC systems (a BrainScaleS wafer module, SpiNNaker board, mobile systems, wafer, ...), additional demo material (e.g. demonstration analog point neurons)
People will be able to try the systems online interactively

Keywords:
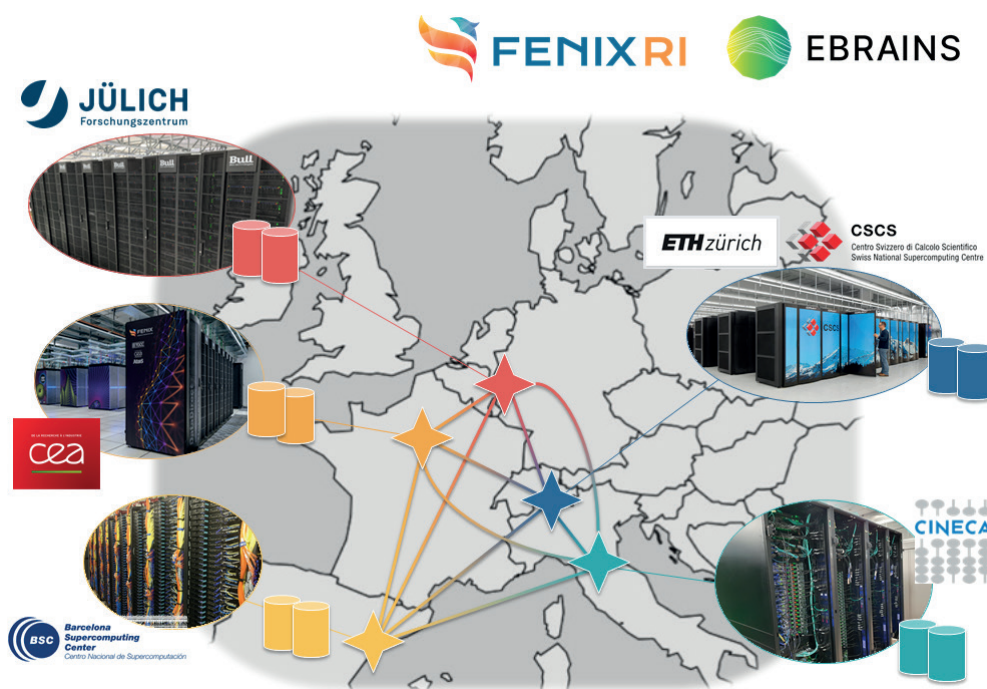#NeuromorphicSystems #SpikingNeuralNetworks #BraininspiredComputing

Find out more:
https://ebrains.eu/service/neuromorphic-computing

EBRAINS COMPUTING SERVICES: HPC, CLOUD, STORAGE & NETWORK SERVICES OF THE FENIX INFRASTRUCTURE

EBRAINS Computing Services provides infrastructure services for the HBP and EBRAINS, including in particular federated HPC, Cloud, storage and network services, building on the Fenix infrastructure.

What will you find at the booth?
Flyers, Stickers, Posters, Videos

Keywords:
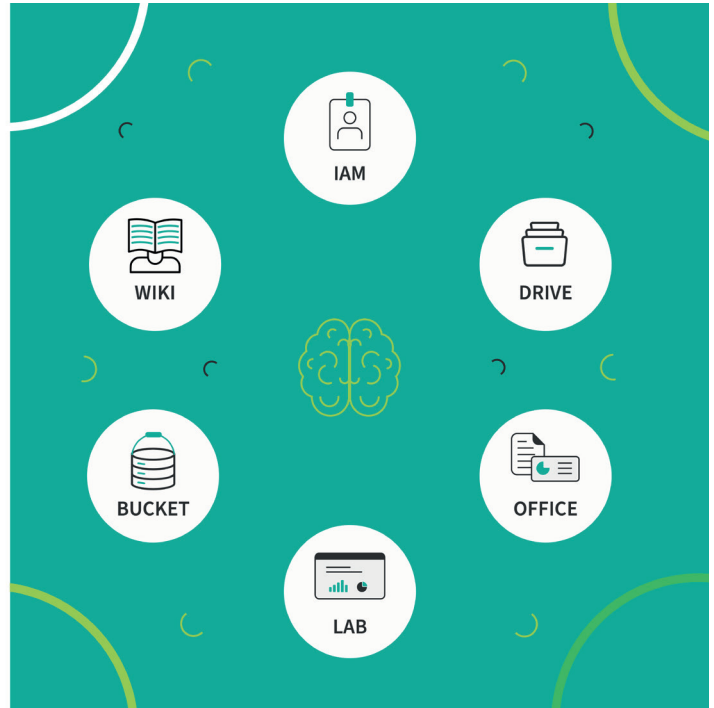**#HighPerformanceComputing #ComputingService #StorageService**

Find out more:
https://ebrains.eu/service/computing-resources

EBRAINS COMPUTING SERVICES:
THE COLLABORATORY

The Collaboratory offers researchers and developers an environment to work in teams and share their work with users, teams or all of the Internet. As part of this offering, users will have access to online processing environments in the form of Jupyter Notebooks, online storage in the form of the Drive and Buckets and an online publishing platform along with collaborative document editing.

What will you find at the booth?
Live demos and explanations of the Collaboratory along with mentions of how it is used in other booths, posters

Keywords:
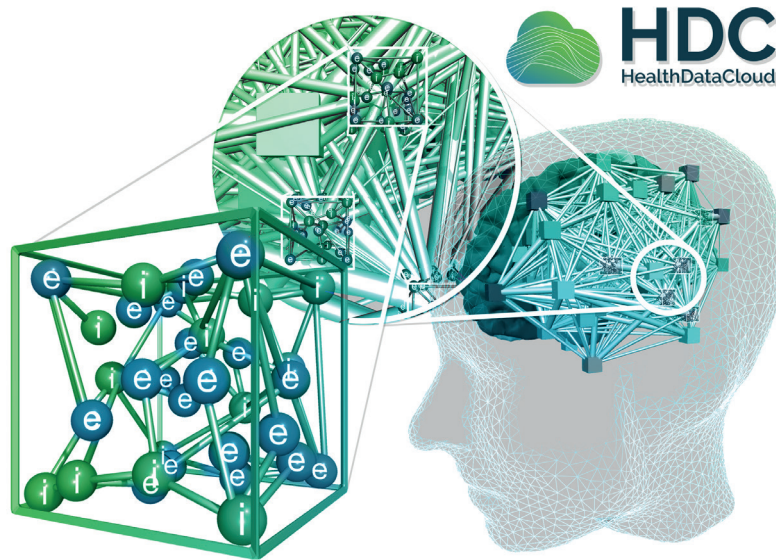#Collaborate #CloudWorkspace #ShareResearch

Find out more:
https://ebrains.eu/service/collaboratory

EBRAINS COMPUTING SERVICES: HEALTH DATA CLOUD

Health Data Cloud (HDC) is a set of EBRAINS computing services for sensitive medical brain data, originating from human subjects, and based on the existing GDPR-compliant and EBRAINS interoperable Virtual Research Environment (VRE), that provides a secure and scalable data platform enabling multi-institutional research teams to store, share and analyze complex multi-modal health datasets.

HDC services for sensitive data also promote practices to ensure that data comply with the FAIR guiding principles and open standards, making data findable, accessible, interoperable, and reusable.

HDC is a federation of interoperable nodes including a central node deployed at EBRAINS RI and an expandable set of satellite nodes deployed at hospitals, research institutes and computing centres.

Tackle the sensitive data challenge in brain research with EBRAINS Health Data Cloud!

What will you find at the booth?
Live demos: VRE research portal and services, use-cases

Keywords:
#VirtualResearchEnvironment #HealthData #GDPR

Find out more:
https://www.healthdatacloud.eu/

EBRAINS RESEARCH INFRASTRUCTURE - CENTRAL HUB AND NATIONAL NODES

The EBRAINS research infrastructure provides digital tools and services which can be used to address challenges in brain research and brain-inspired technology development. Its components are designed with, by, and for researchers. The tools assist scientists to collect, analyse, share, and integrate brain data, and to perform modelling and simulation of brain function.

EBRAINS is an AISBL (Association Internationale Sans But Lucratif) under Belgian Law. Its mission is to coordinate the Human Brain Project (HBP) in SGA3 (2020 - 2023) and to build the future of the EBRAINS Research Infrastructure.

What will you find at the booth?
This booth will provide information about the EBRAINS Research Infrastructure. You will have the opportunity to meet representatives of the Central Hub, National Nodes, and current Projects of EBRAINS. Please see the timetable below:

	Tuesday 28/03	Wednesday 29/03	Thursday 30/03
09:00 - 10:30			PHRASE
11:00 - 12:30	EBRAINS PREP	Italian Node	eBRAIN-Health
13:00 - 14:30	German Node	Spanish Node	TEF-Health
15:00 - 16:30		Belgian Node	French Node

Keywords:
#ResearchInfrastructure #digitaltools #nationalnodes

Find out more:
https://ebrains.eu/