The HBP Calls for Expression of Interest for SGA3 "EBRAINS Workshops"

Call Text

Human Brain Project

EBRAINS

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Abstract:	Call text for SGA3 EBRAINS Workshops
Keywords:	EBRAINS Workshop, research infrastructure, tutorial,
Target Users/Readers:	PIs from the scientific community, both inside and outside the HBP Consortium
Call publication date:	1 October 2020
Proposal Submission Deadline:	This Call is permanently open. Proposals will be evaluated after specific cut-off dates. The upcoming cut-off dates can be found on the Call's website.
Call topic	EBRAINS Workshops
Total budget/human recourses	Total budget for one EBRAINS Workshop: EUR 22,000 and 3-4 person-months provided by the HBP Education Programme Office
More information	workshop.edu@humanbrainproject.eu
Proposal submission	HBP Open Call Platform

Through this Call for Expressions of Interest (CEoI), applicants (from within and outside the HBP) can request administrative and financial support provided by the HBP Education Programme for the planning and organisation of an EBRAINS Workshops event. **Interested applicants are encouraged to get in touch with the HBP Education Programme during the application stage.**

The Human Brain Project

The Human Brain Project (HBP, https://www.humanbrainproject.eu/) is an ambitious 10-year research initiative, and part of the EU FET Flagship programme. The Project's unique goal is to interconnect computer science, medicine and neuroscience to accelerate the understanding of the human brain and its diseases, and to harness that knowledge to the benefit of society. To achieve this, the Project has built EBRAINS (http://ebrains.eu) – the world's first integrated ICT infrastructure for brain research and development, offering growing capabilities in neuroinformatics, brain simulation, medical informatics, neuromorphic computing and neurorobotics, underpinned by high-performance analytics and computing.

The HBP Education Programme

The HBP Education Programme[1] is an interdisciplinary teaching programme offering innovative training formats for early-career researchers working in and between the fields of neuroscience, ICT, and medicine. The programme especially targets advanced Master students, PhD students and early post-doctoral researchers. It currently comprises various formats:

- EBRAINS Workshops: Multi-day workshops introducing different parts of EBRAINS
- HBP Student Conferences: A platform for collaboration and scientific exchange between early-career scientists
- EBRAINS Infrastructure Training events: Hands-on training on the use of the various services and tools offered by EBRAINS
- Young Researchers Events: Introductory format to introduce participants to the Research Infrastructure offered and developed by the HBP
- HBP Education Programme E-library: Educational video material publicly available

EBRAINS Workshops

EBRAINS Workshops are multi-day events that offer plenary lectures in combination with parallel hands-on workshop modules under an overarching theme. The programme should give an advanced introduction to specific topics, guide attendees through the opportunities of specific parts of EBRAINS Research Infrastructure (EBRAINS RI) and give introductory tutorials and trainings on specific parts of the Platforms. The goal is to introduce participants to the opportunities provided by the EBRAINS RI and educate them on the resources that are offered by EBRAINS.

Workshop modules can be independent of each other content-wise, enabling the planning of parallel sessions in order to reach a significant number of participants per event. The plenary sessions give the opportunity to present an overview of EBRAINS offers and / or EBRAINS-related research results. Submitters can propose on-site events as well as hybrid formats, which are a combination of on-site and virtual sessions[2].

[1] https://humanbrainproject.eu/education

[2] Proposals on **fully virtual EBRAINS Workshops** will be considered as eligible for evaluation in case of exceptional circumstances preventing the event taking place on-site within a reasonable time frame, such as nationally regulated Covid-19 prevention measures. If applicants propose a fully virtual event due to exceptional circumstances, they are asked to clarify in the proposal under "type of event" why this event is expected to hold a similar educational value and impact, compared to its on-site alternative.

The HBP Education Programme supports EBRAINS Workshop events that showcase one or more of the existing and upcoming EBRAINS areas and educate participants on how to use the respective resources and tools provided by EBRAINS:

- Data and knowledge: https://ebrains.eu/services/data-knowledge
- Brain atlases: https://ebrains.eu/services/atlases
- Brain modelling and simulation: https://ebrains.eu/services/simulation
- Neurorobotics: https://ebrains.eu/services/ai-and-robotics/neurorobotics
- Massive computing: https://www.humanbrainproject.eu/en/massive-computing/
- Neuromorphic computing: https://www.humanbrainproject.eu/en/silicon-brains/
- Medical informatics: https://mip.ebrains.eu/

In addition, applicants have to outline in detail how the proposed EBRAINS Workshop relates to selected take-up measures for the achievement of one or more of the HBP SGA3 Outcomes[3].

EBRAINS Workshops target the following groups (regardless of affiliation with the HBP or not):

- Early-career researchers
- Participants who are interested in learning about different EBRAINS offers as outlined in the suggested target audiences and beyond (e.g. developers, senior scientists, data analysts)

Administrative and financial support offered by the HBP Education Programme for EBRAINS Workshop Events

Financial support: Up to EUR 22,000 per event to cover costs that incur in the context of the event

Administrative support[4]:

- Coordination of programme committee
- Management of registrations
- Communication with participants
- Promotion and outreach (newsletter, social media, event calendars)
- Collection of registration fees
- Management of budget / budget transfers
- Management of financial student support
- Management of speaker reimbursements
- Coordinating venue logistics (in collaboration with local host) and catering
- Preparation of event materials (e.g. programme, badges, etc.)
- On-site administrative support / web-conferencing software support
- On-site media support (photographing, video recording if required)
- Post-processing of event (photo and video editing if required, report, workshop survey)
- Event report

Effort: 3-4 person-month (PM) provided by the HBP Education Programme

[3] The Human Brain Project Outcomes, Main Take-up Challenges and Measures in SGA3 can be found in Annex 1.

[4] Support requirements vary from event to event. This list provides an overview for applicants of administrative and financial support offered by the HBP Education Programme Office. Support details will be agreed upon during a first meeting between both parties.

Annex 1: The Human Brain Project Outcomes, Take-up Challenges, and Measures to address Challenges

Outcome	Main Take-Up Challenges	Measures to Address Challenges
OC1. Thanks to the HBP achieving PO1, EBRAINS will facilitate access to and the enrichment of research tools, allowing constantly updated knowledge on brain function and brain-derived AI to be quickly shared across Europe, leading to a considerable increase in the amount of scientific data, educational material and research on advanced AI produced by the communities.	• Brain-derived AI (i.e. deeply brain-inspired), is still in its infancy, with fragmented dissemination channels (congresses, journals, etc.). • Few teams working on this, lack of awareness, few successful examples to bootstrap take-off), training and education lacking (and perhaps funding). • Insufficient number of success stories to push external take-up. • Need user friendly access, high bandwidth, largescale storage and access capabilities with long-term guarantee (EBRAINS operates in a competitive environment regarding scientific data). • Lack of awareness about curation requirements. • Lack of guarantee for data providers that their data will not be abused.	M1.1 Integrate community engagement efforts, and create joint formats. M1.2 Collaborate with external partners in the field to get critical mass. M1.3 Increase success stories and their visibility. M1.4 Stay in close contact with the communities to adapt technological development accordingly. M1.5 Use showcases to demonstrate the advantage of EBRAINS, and make them public. M1.6 Help the communities to curate data (HLST), and show the concrete advantages (e.g., higher citations, download by other users). M1.7 Transparent communication about ethics and data standards, rigorous security checks.
OC2. Thanks to HBP activities that support massively parallel execution of virtual experiments on high performance computers (including modelling and simulation of the brain as well as neurorobotics), basic brain science will explore new avenues and new industry-driven research will be launched on devices such as implants and prostheses, as a direct outcome of PO1, PO3 and PO5.	• Virtual experiments on HPC not yet common and methods unfamiliar to the neuroscience community. • Insufficient number of teams working on this (and perhaps funding), lack of awareness. • Maturity gap, from academic developments (TRL4-) to industrial relevance (TRL7+). • Lack of involvement of RTOs and of support or interest by large European companies, or SMEs.	M2.1 Increase dissemination, education events, generate high-level publications. M2.2 Successful examples to bootstrap the take-off, training and education. M2.3 Increase proportion of developments with high TRL. M2.4 Develop strategies (e.g. specific forums, presentation at trade shows, targeted calls, activities in National Hubs) to increase engagement.
OC3. Thanks to EBRAINS simulation services (including their many analytical workflows (PO3) and data security measures), there will be a rapid change in how the brain research community manages and uses its data and, consequently, an increase in research into multi-level brain complexity (in space and time), hopefully leading to related new discoveries.	• Difficult elements of cultural shift on FAIR may slow down the process. • Possible competitive solutions from other continents (especially the USA). • Lack of support for some types of data (storage, visualisation, mining). • Integrating different simulation approaches to study multi-level brain from researchers who so far focused on one level of organisation using one simulation engine (now have to collaborate to generate tools bridging many scales). • Few teams working on this, lack of awareness, few successful examples to bootstrap take-off), training and education lacking (and perhaps funding).	M3.1 Show the success stories of brain simulation M3.2 Address the lingering simulation science skepticism issue directly M3.3 Showcase the advantages and uniqueness of EBRAINS simulation solutions M3.4 Activate relevant communities to develop support M3.5 Provide interfaces to the different communities and show the advantages in take up when collaborating at scale M3.6 Increase engagement with external partners, encourage simulation science engagement via National Hubs.
OC4. Thanks to EBRAINS Atlas tools for combining, analysing and integrating brain data in 3D space (PO2), interventions in patients' brains will be better guided. In particular, thanks to the Human Brain Atlas, neurologists and neurosurgeons in	• Neurologists and neurosurgeons are heavily occupied by clinical duties, and may have not enough time for co-designing such tools.	M4.1 Identify individuals and groups who have an intrinsic interest to develop such methods, identify physician scientists to support. M4.2 Use EBC, EBRA and IMI as mediators.

clinical practice will be able to develop a wide range of tools for preparing personalised brain models for patients undergoing surgery (such as the TVB application for epilepsy patients). They will also start to provide software for stereotaxic interventions, such as deep brain stimulation (DBS) in patients with Parkinson's, or to support surgery on brain tumors, by providing microstructurally plausible information on target brain regions.	• Engagement with the respective professional associations to obtain their support is necessary. • Medical products law foresees extensive procedures for any product applied in the clinical setting.	M4.3 Use National Hubs as interface to national associations. M4.4 Build on experience of existing activities to speed up exploitation life cycle.
OC5. Thanks to the building blocks offered by the EBRAINS Neurorobotics Platform (PO1), roboticists will be supported throughout the whole robot development process; from initial design, to simulation for the development of controllers, through to the final 3D print. As a result, they will be able deliver new, low-cost, special-purpose robots built on demand; particularly for medical use-cases, where they might simply be discarded after a single use.	• Lack of motivation by industry (lacks awareness of possibilities, advantages, costs, examples, adequate documentation, training and support). • Medical certification is time-consuming and involves the interaction of many stakeholders, which means that industrial take up may partly start only after SGA3. • Difficult to enter medical arena, even for prototypes. • Lack of information or documentation on the HBP API that allows robust connection to existing complementary services supporting design and 3D printing of robotic systems.	M5.1 Make showcases visible, use industry forums like trade fairs, technological congresses, technical academies, etc. to demonstrate value. M5.2 Build on experience of existing activities to speed up exploitation life cycle. M5.3 Build on existing HBP networks, e.g., hospitals participating in the MIP; team-up with EBC and National Hubs. M5.4 Build trust to overcome and obtain legal support.
OC6. Thanks to the HBP's contributions and leading role envisaged in PO7, the International Brain Initiative will deliver solid neuroethics guidance to neuroscience projects in the world; in particular, regarding the ethics of large neuroscience research infrastructures.	• Ethics standards differ around the world, e.g. on data protection and privacy, animal welfare, etc. • The development of a common understanding and guidelines requires time and solid initial proposals.	M6.1 Try to identify common ground, and move on from there M6.2 Learn from past involvement, where multilaterally supported guidelines have been developed
OC7. Thanks to HBP findings, including theoretical models and related simulations, new clinical settings will be explored to assess the level of consciousness in patients with consciousness disorders (e.g. comatose patients) and sets of information will be proposed for supporting prognosis and therapeutic decision-making (PO4, PO6).	• Measuring consciousness depends on complex equipment with appropriately trained teams. • Need to find motivated teams and/or motivate teams with enough time and appropriate support. • Clinical products, diagnostic tools or methods require extensive procedures to get marketing authorisation, which may delay application in hospitals until beyond 2023. • Information package needs to be presented in an appropriate form, even for pre-use in very special medical environments.	M7.1 Team up with international partners, which can play a pioneering role. M7.2 Identify interested and engaged partners, use HBP networks. M7.3 Learn from experience in past years to speed up. M7.4 Present information in an appropriate way, communicate with clinicians to find out what the best format is.
OC8. Thanks to HBP efforts in translating neuroscientific knowledge into medicine (PO6), a new clinical procedure will be trialled for epilepsy patients, building on the current EPINOV study in France, and a multi-centre, preclinical study of rare diseases will be launched.	• Long, stepwise process has to be followed to get authorisation for a new clinical trial. • A multi-centre study requires the commitment and coordination of many hospitals. • Need to find motivated teams and/or motivate teams with enough time and appropriate support.	M8.1 Learn from early experiences in past years to speed up exploitation life-cycle. M8.2 Use existing networks to get other parties involved, show the advantage of such studies M8.3 Identify motivated clinicians, search for colleagues with clinical scientist profile who are working at the interface of medicine and research. M8.4 Use ongoing collaboration as starting point. M8.5 Be present at large congresses.

		M8.6 Make success stories visible.
OC9. Thanks to EBRAINS making available new, high performance, closed-loop functions based on insights into human cognition (PO5), industry will be able to develop advanced prototypes for industrial and service robots, advanced autonomous systems, or protheses, e.g., for the visually impaired.	• Industry teams and business need to be aware of potential benefits (competitive performance, technological maturity and new markets). • Limited availability of spare resources for engaging in method; limited support/training available, and few existing examples. • Issues stemming from lack of transparency of neuromorphic technology, which are challenging in safety-critical applications. • Prototypes based on closed-loop simulations going to real-word scenarios might be too simplistic.	M9.1 Develop targeted showcases to demonstrate the benefits of Neurorobotics Platform use. M9.2 Use digital education pathways and training to reach a broader, global audience. M9.3 Build trusting collaboration with users, communicate, participate in the respective communities. M9.4 Increase complexity by integrating new features learnt from the brain in an iterative way.