INNOVATION IN HBP

HBP Spanish Hub Workshop

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INNOVATION IN HBP
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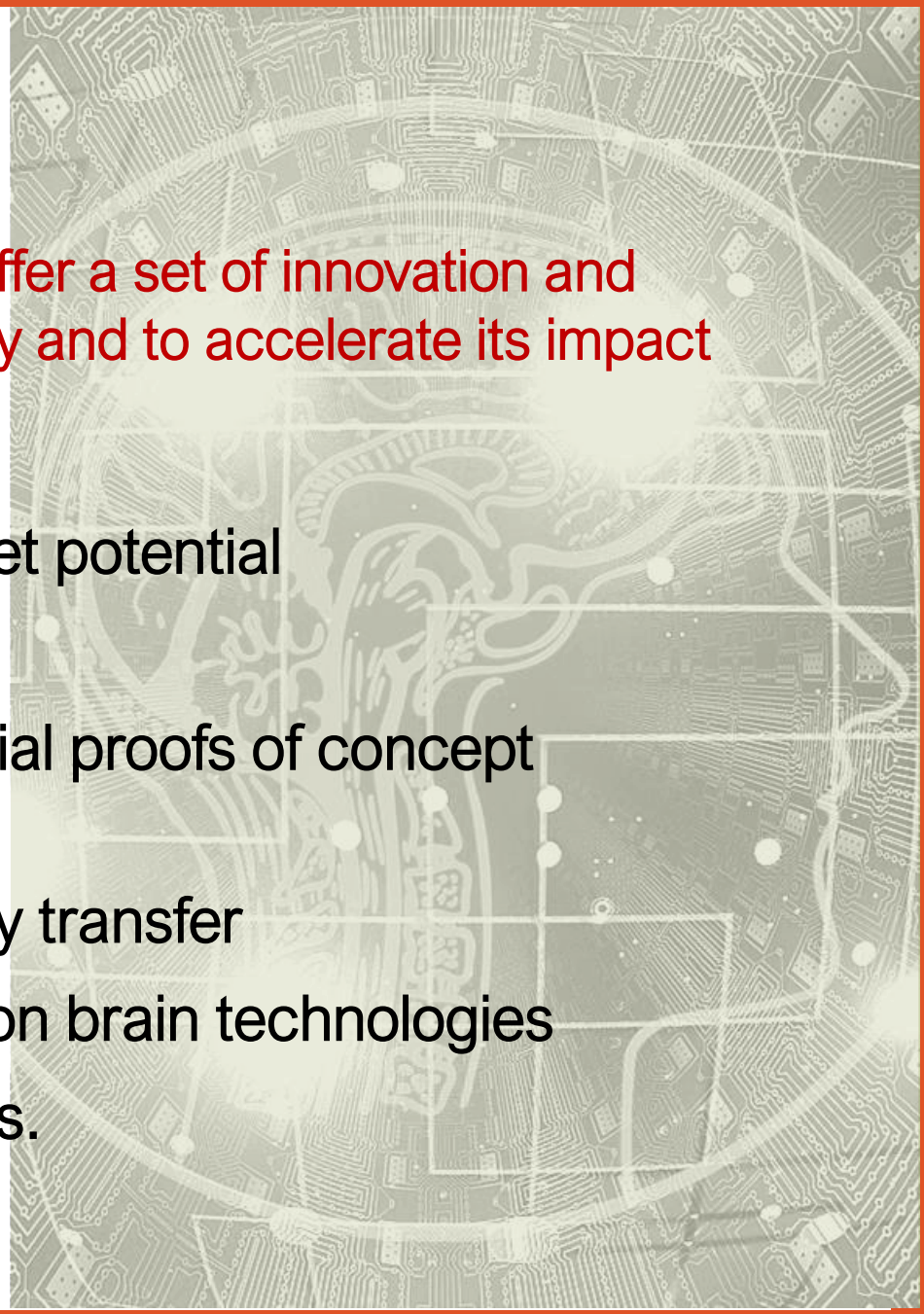
INTRODUCTION TO HBP INNOVATION

Innovation management in HBP

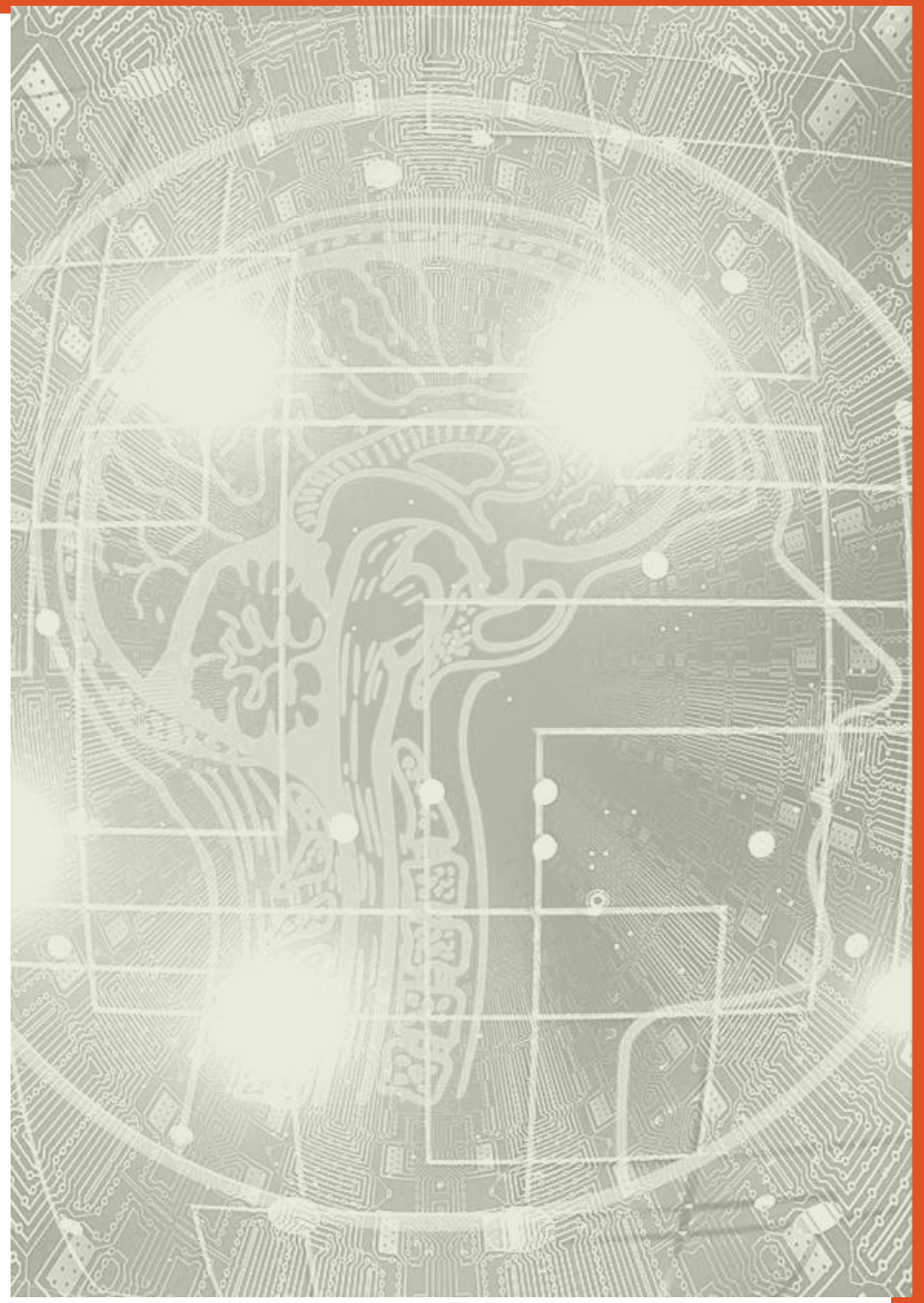
The objective of the Innovation team of HBP (UPM) is to offer a set of innovation and technology transfer services for the whole HBP community and to accelerate its impact in society.

1. Identifying emerging brain technologies with market potential
2. Performing technology and market watch reports
3. Supporting the evolution of prototypes into industrial proofs of concept to bring TRLs closer to international markets
4. Training people on brain innovation and technology transfer
5. Promoting the creation and scale-up of start-ups on brain technologies
6. Launching industrial hubs in participating countries.

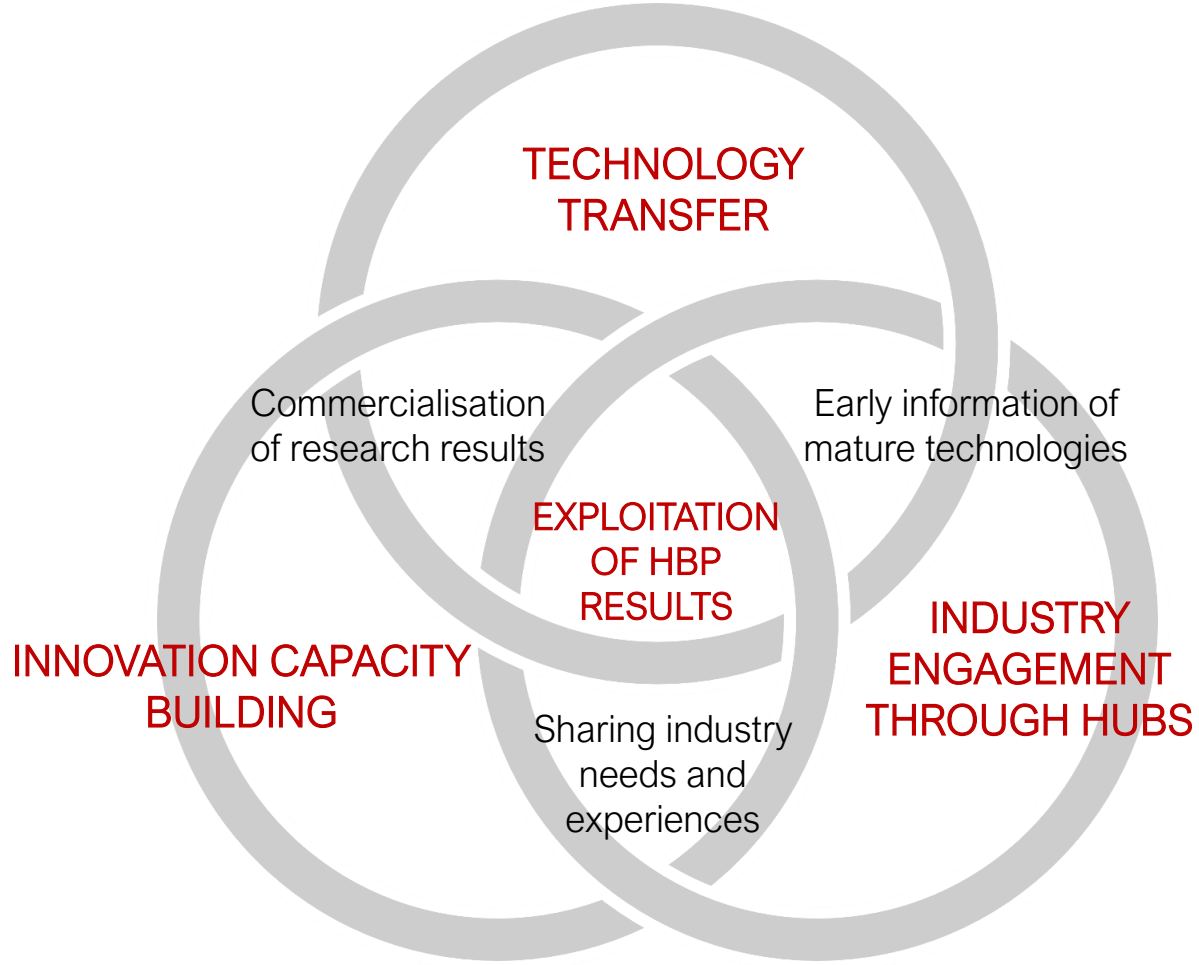


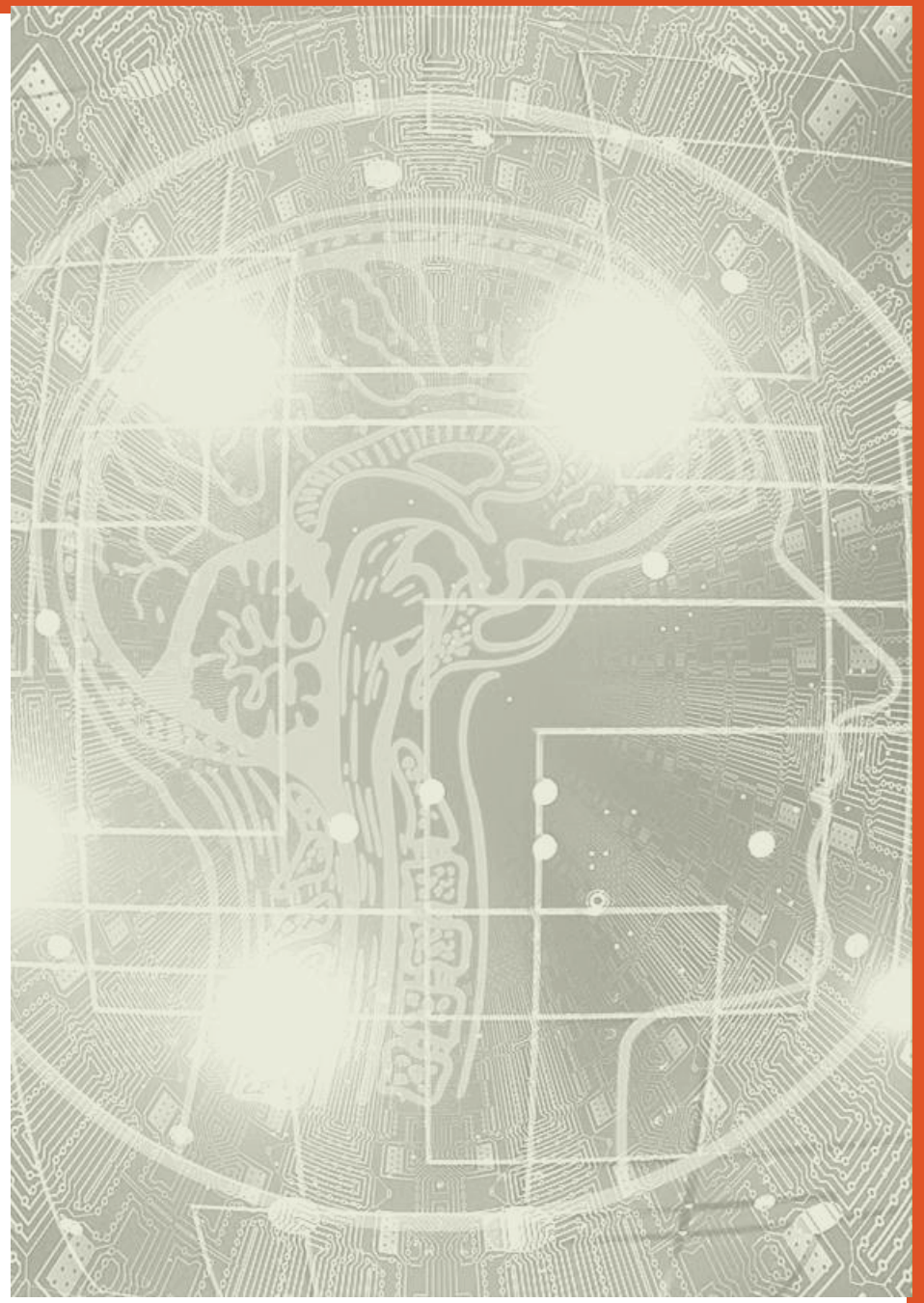
A centralised HBP innovation function

1. A shared and common vision on HBP technology innovation
2. Many innovation activities are transversal, and a global feedback on innovation is regularly requested by the EC
3. Demand of support for innovation and training is radically different across partners
4. Comparations of innovation performance among HBP partners and sharing best practices
5. Central support is needed to foster cooperation between partners and exploit synergies
6. A homogeneous and shared TRL assessment and IP understanding is needed across partners



Innovation strategy in SGA2





Innovation activities in SGA2

Technology transfer

- UPM designs an **Exploitation plan** for HBP available results
- UPM guides researchers and developers to elaborate their specific exploitation **plans**
- UPM develops an **Innovation policy** of HBP: protection, exploitation, ownership of results
- UPM works to **identify and update HBP technologies with market potential** and promote collaborations with interested actors
- UPM **facilitates conversations** between HBP technology developers and companies interested in exploitation.
- UPM makes **market**, **trend analysis** and **roadmaps** of available technologies

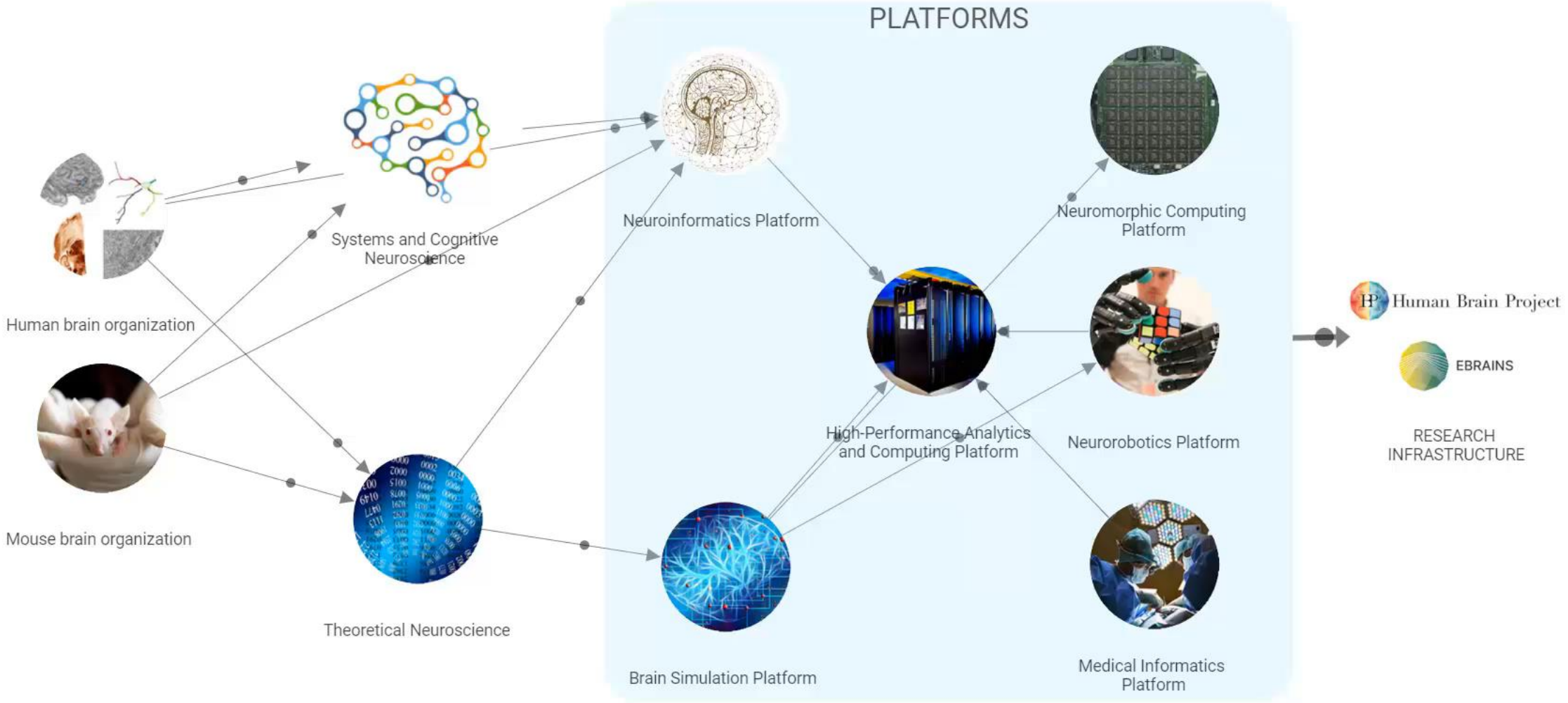
Innovation capacity building

- **Conceptualizing** innovation: what, when, why and how to innovate
- **Technology readiness** assessment checklist for hardware, software, datasets and services
- **Webinar** courses on the exploitation of research results, IP and technology transfer
- **Parallel sessions** at annual HBP summits

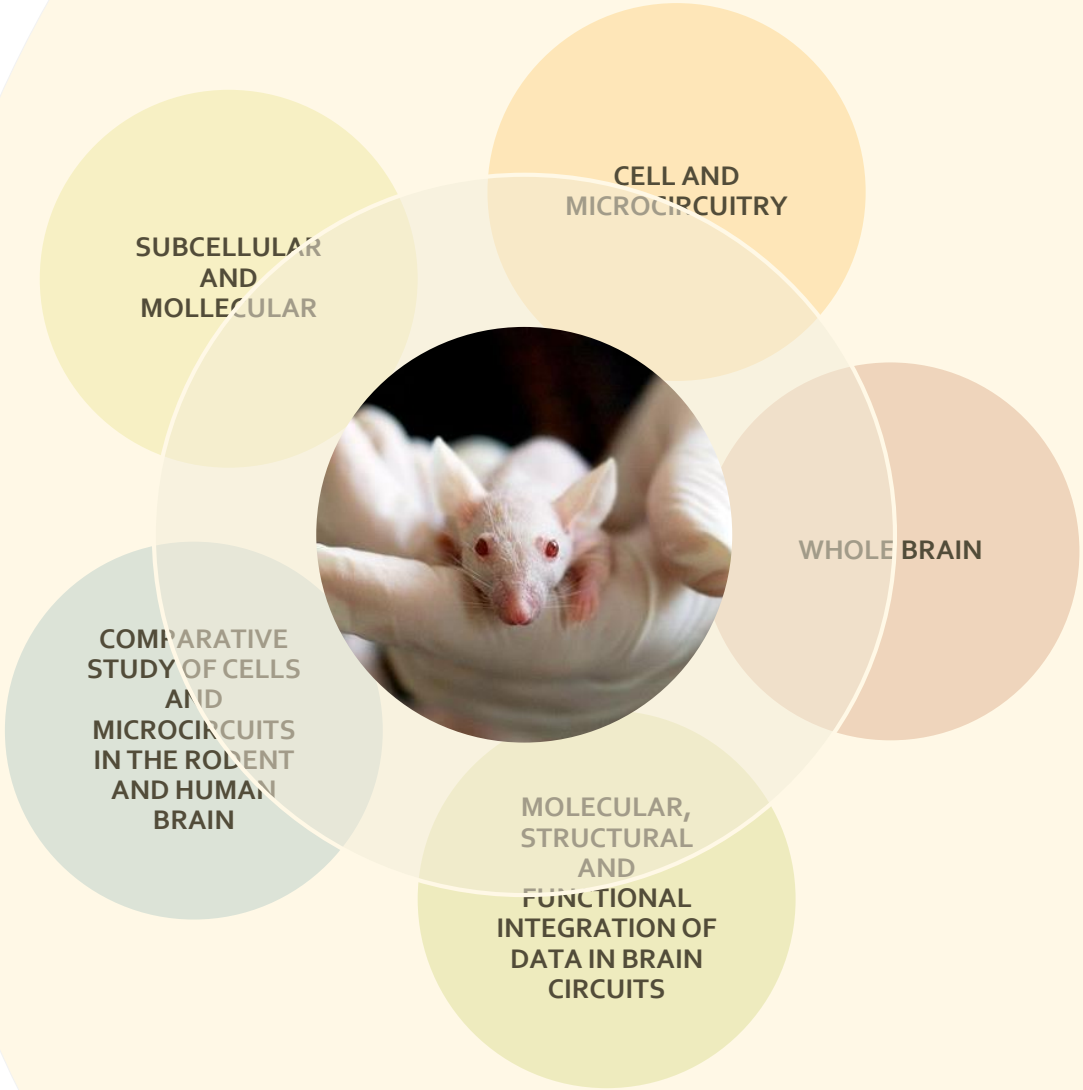
Industrial hubs

- **To engage industry** with HBP by offering a set of incentives to be closer to HBP developments and research results
- To promote the access of members to **HBP tools** and **services**
- To facilitate **interaction** between hubs members and HBP developers
- To encourage members in **expanding** and **improving** services of the HBP platforms and future infrastructure

HBP research & technology development groups in a nutshell



Mouse Brain organization



MISSION AND EXPECTED RESULTS

The human brain shares many common features with other non-human mammals. These features can be considered as basic building blocks of mammalian brain organization. Therefore, it is crucial to choose appropriate experiments to obtain strategic data that can be extrapolated to the human brain.

High-quality multi-level datasets at molecular and subcellular level of single molecules, single synapses and single cells

High-level multiscale datasets at cellular and microcircuit level on selected brain regions: neocortex (including thalamus), hippocampus, basal ganglia and cerebellum

Structural and functional datasets on a brain-wide scale by using cutting-edge imaging technologies

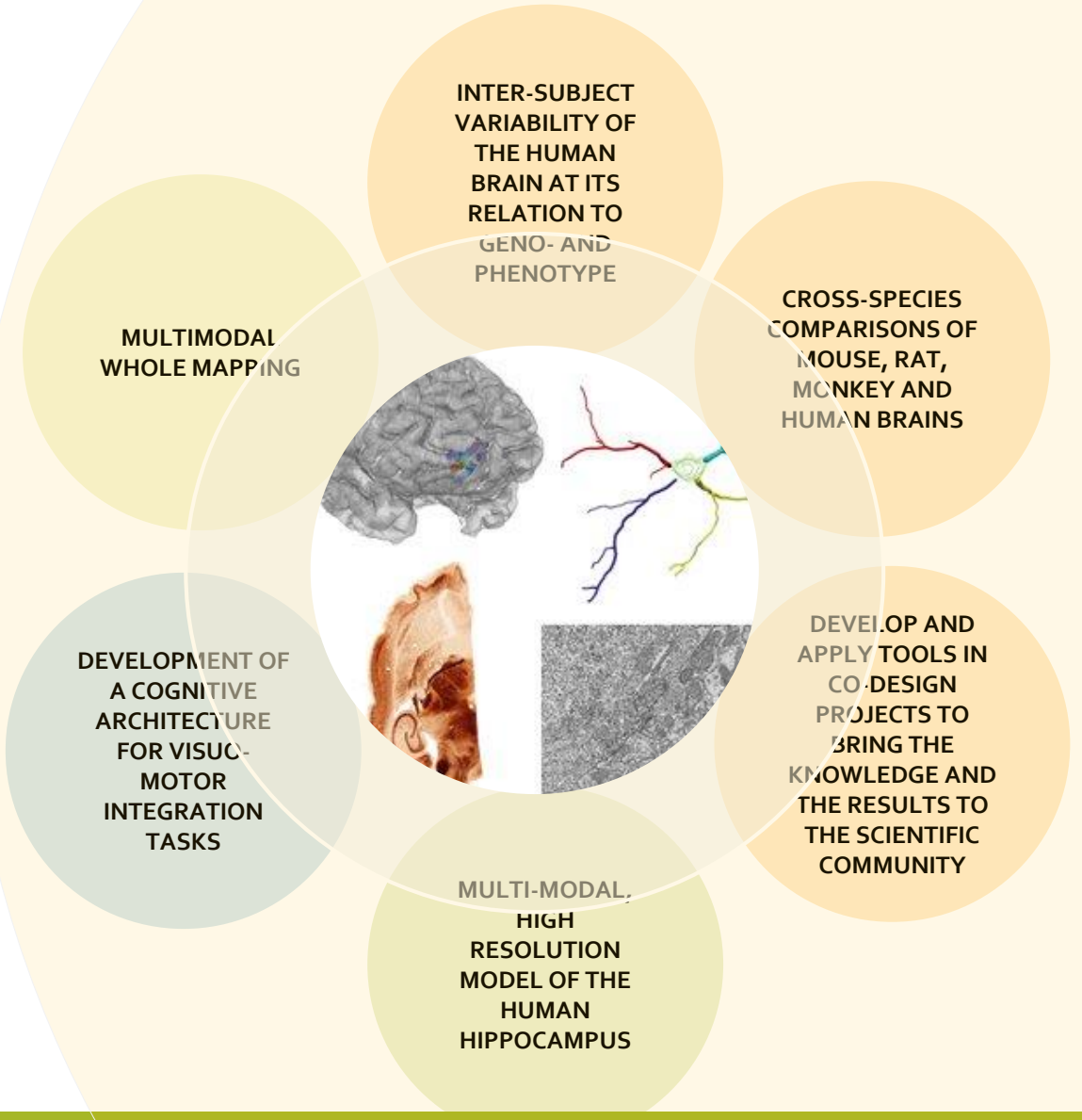
Multi-level datasets generated by integrating neuroanatomical data with genetic, molecular and physiological data using advanced technologies.

Strategic datasets on single neurons and circuits to be used in comparative studies on human and rodent

DEVELOPING TECHNOLOGIES

- DeepScope
- RAPID
- Synaptic proteome map
- Nanobody platform
- SynActive Tool Box and platform
- Gold particle detection and quantification (GPDQ)

Human Brain organization



MISSION AND EXPECTED RESULTS

One of the greatest goals of HBP is to develop the HBP HUMAN BRAIN ATLAS, which can be used by neuroscientists all over the world, in neurosurgery and as a basis to understand the differences between the healthy and diseased brain. HBP researchers are working on a map of the human brain based on differences in the distribution and size of the neurons in brains of body donors. Connections between the neurons, i.e. nerve fiber and bundles can be detected by powerful methods such as polarized light imaging and diffusion tensor imaging. Functional magnetic resonance imaging is used to identify regions and networks involved in brain functions like visual and auditory processing or cognition and reveal more and more details of the functional brain organization.

Multi-modal and multi-scale human brain atlas . Concepts, methods, maps and data

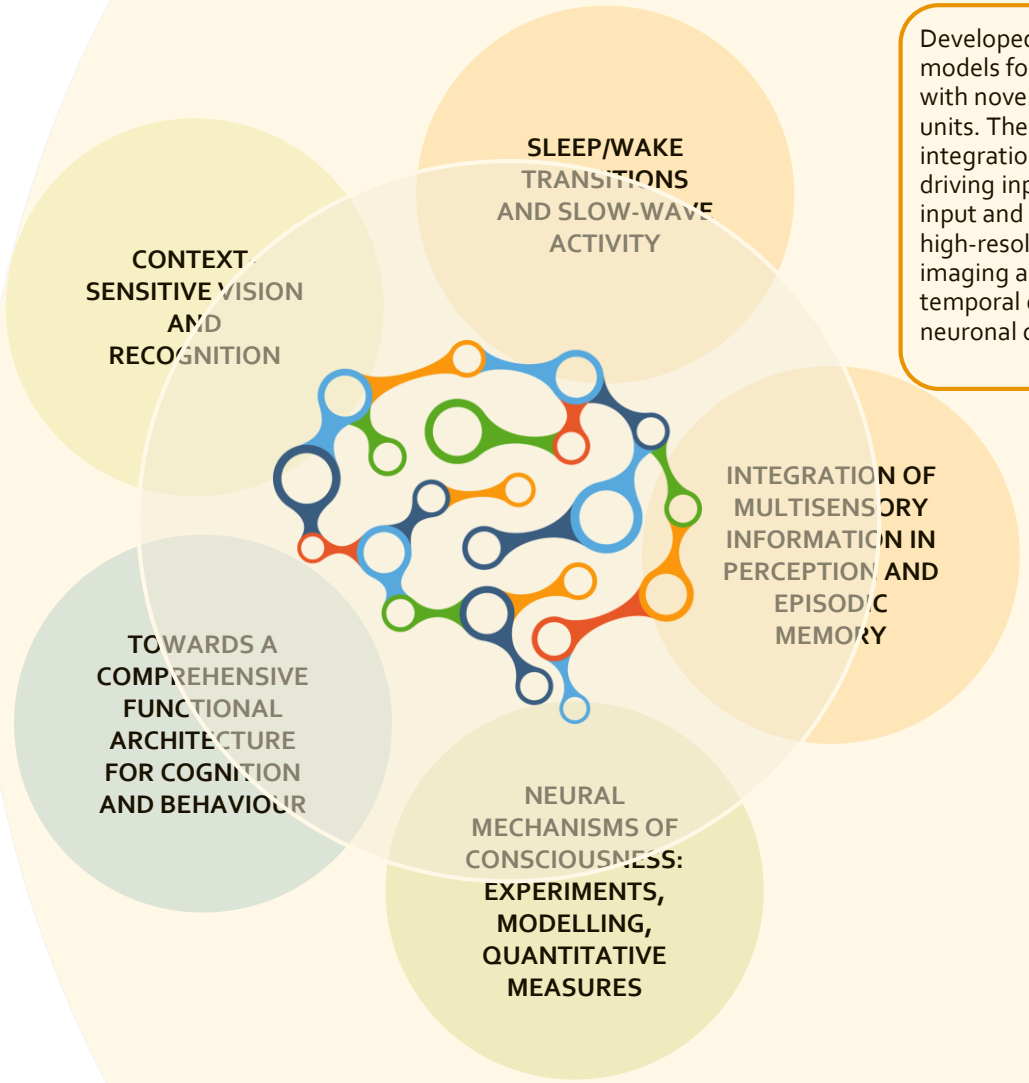
High-resolution reconstruction of nerve fiber architecture applying 3 different imaging techniques in the same brain sample (i) high-field and strong gradient diffusion MRI (dMRI), (ii) 3D-Polarised Light Imaging (3D-PLI), and (iii) Two-Photon-Fluorescence Microscopy (TPFM)

Visuo-motor integration neuronal network model

DEVELOPING TECHNOLOGIES

- Query and analysis tool for Allen human gene expressions grouped by atlas regions
- Interactive Human Brain Atlas
- PLIViewer
- BUNDLES: Identifying long and short fiber bundles
- Disco: Robust spatial normalization of brain images
- Individual brain charting: a task fMRI dataset for cognitive mapping
- JuGEx, tool for combined analysis of cytoarchitectonic areas and gene expression
- Method SWITCH/TDE

Systems and Cognitive Neuroscience



MISSION AND EXPECTED RESULTS

Uncovering neural mechanisms underlying cognitive processes, such as learning, multisensory integration, perception, sleep, consciousness, and associated systems phenomena. The results provide the constraints for the development of computational models of cognitive and systems-level processes that will be implemented in robots and neuromorphic computing systems.

Developed deep neural network models for visual recognition with novel context- modulation units. These units have separate integration sites for bottom-up driving input and for contextual input and will be informed by high-resolution human brain imaging and neuronal relating to temporal expansion of context in neuronal computations.

A collab. including experimental data, simulation models and analysis tools relying on novel concepts and approaches to characterize slow wave activity

Acquisition of brain imaging and electrophysiological recording, models of multisensory integration and spatial memory and navigation, and brain-inspired robots (i.e. visual-tactile rodent-like robot and a humanoid robot)

A collab. to gather different measures of consciousness and their generalization from different pathophysiological (e.g. brain injuries), physiological functional states and anesthesia conditions in humans, animal models, computer simulations and neuromorphic circuits.

Computational modelling of multisensory deep predictive coding with potential use in AI and robotics

DEVELOPING TECHNOLOGIES

- Tool for Realtime tracking of behavior using Neuromorphic approaches
- Tool for Realtime tracking of behavior using DeepLab Cut approach
- Tool for RealWorld behavior in head fixed mice
- Perturbational Complexity Index algortithm
- (Semi) automated DOC diagnosis using machine learning, FDG-PET and Resting State fMRI
- Light regulated ligands of neuronal receptors for remote photostimulation
- Measuring consciousness through brain complexity
- Measuring neuronal bistability in brain injury
- PyGate

Theoretical Neuroscience

SIMPLIFIED SPIKING MODELS OF DIFFERENT BRAIN AREAS GENERIC

BRIDGING SCALES

LEARNING AND MEMORY

LINKING MODEL ACTIVITY AND FUNCTION TO EXPERIMENTAL DATA

THE EUROPEAN INSTITUTE FOR THEORETICAL NEUROSCIENCE

MODELS OF BRAIN ACTIVITY AND FUNCTION

MISSION AND EXPECTED RESULTS

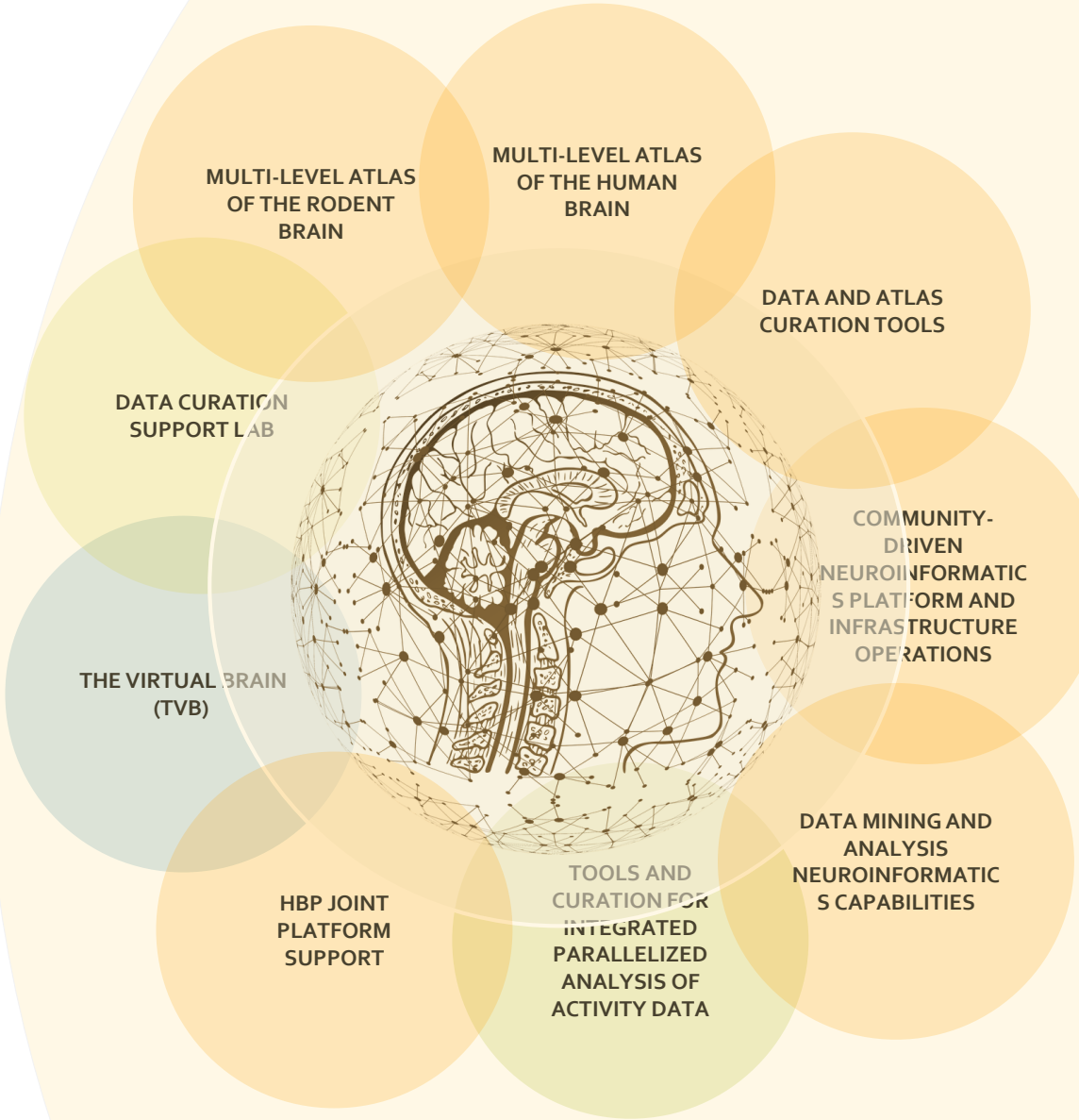
Theoretical Neuroscience is a link between experimentalists and technology. Brain mechanisms identified in the experimental HBP Subprojects are formalized into mathematical models, which are then made available to the HBP Platform. Theoretical Neuroscience is needed for linking scales, another fundamental aspect of brain exploration.

- Develop models single-cell and population levels
- Plausible biological models of plasticity for large networks with non-trivial functionality
- Develop models of brain activity and function
- Validation of spiking network model against experimental data
- Parameter space confinement of mesocircuit model for the reproduction of experimental data
- Release of multi-area model of macaque visual cortex
- Release of draft implementation of generic network model with glial contribution
- Release of draft multi-layered cortical network model with spatially organized connectivity
- Demonstration that brain personalized network models have predictive value for epileptogenic zones of individual patients
- Demonstration of explanatory value of large-scale brain network mouse models with impaired connectivity and
- EITN postdoctoral program

DEVELOPING TECHNOLOGIES

- Softare "pyGAlib"
- Software "pyMOU"
- Software "NetDynFlow"
- Full-density model of cortical microcircuit
- Multi-area model of cortical network at neuronal resolution
- Mesocircuit model
- The Bayesian Virtual Epileptic Patient
- The Virtual Brain
- Personalized in-silico Brain Networks
- Virtual Mouse Brain
- Virtual Epileptic Patient (VEP) brain model
- A method of modulating epileptogenicity in a patients brain

Neuroinformatics Platform



MISSION AND EXPECTED RESULTS

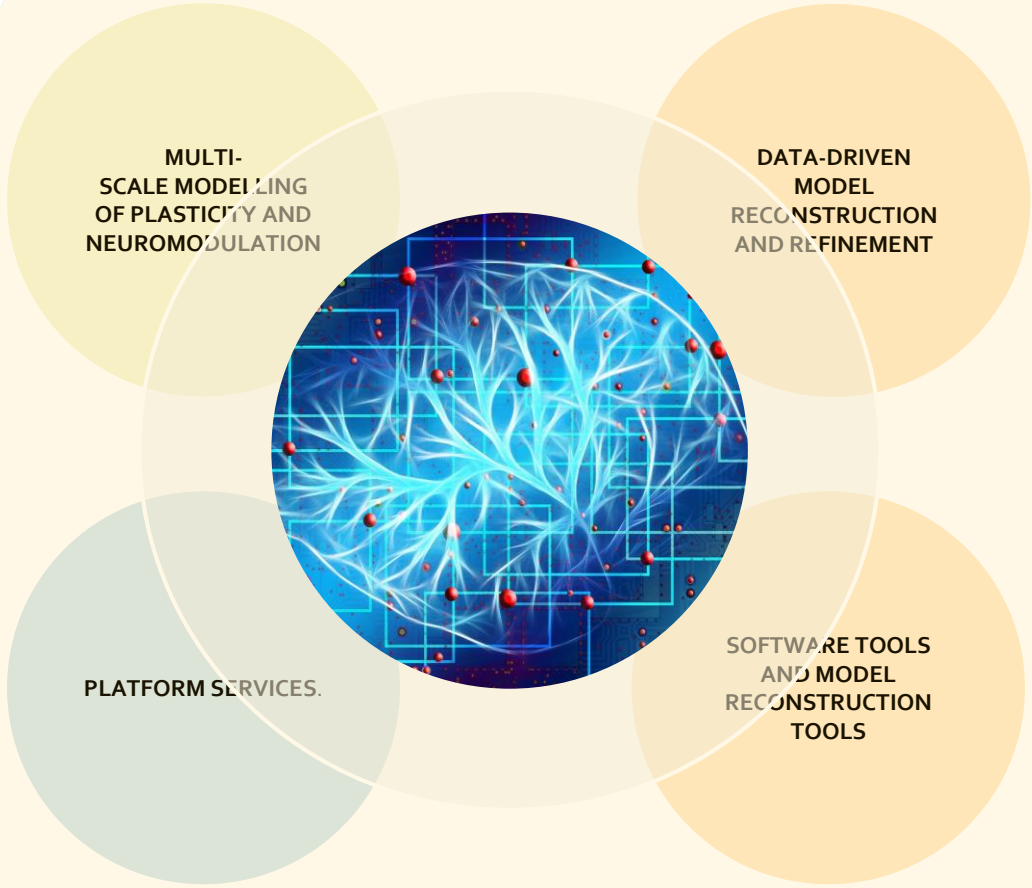
To provide the informatics tools and services that make data integration in HBP possible. Data from the brain produced in other Subprojects are organized and managed, then made available for collaborative use by all researchers in HBP and the wider neuroscience community.

- Proven metadata curation approach
- Data and model discoverability portal that links HBP data and models
- Workflow going from heterogeneous experimental image data to extracted quantitative features defined in rodent atlas space
- Proven approach for assigning spatial metadata to HBP data and models
- Prediction based cell-type specific mesoconnectome
- Interactive exploration of function, connectivity, cytoarchitecture
- Queries for structural parcellations, genetics, and activity
- Tools to enable complete workflows from metadata annotation, data curation, and spatial integration
- A user-driven, data-sharing and data-management infrastructure accelerating scientific progress.
- Machine learning based image analysis tools integrated in the Neuro informatics platform.
- HBP-specific workflows developed to fully leverage the current state-of-the-art in computer vision with regards to object detection and segmentation problems.
- Comprehensive analysis toolbox to support analysis workflows for electrophysiological activity data from experiments and simulations
- The neural activity resource (NAR) as a central mechanism to register, annotate and browse activity data sets within the HBP
- HBP and non-HBP affiliated researchers using interoperable platforms

DEVELOPING TECHNOLOGIES

- Knowledge Graph
- LocaliZoom: viewer for series of 2D images with reference atlas superimposed
- Elephant
- Neo
- QuickNII
- Neuroinformatics platform

Brain Simulation Platform



MISSION AND EXPECTED RESULTS

The Brain Simulation Platform (BSP) is an internet-accessible collaborative platform designed for the digital reconstruction and simulation of brain models. Researchers can access the BSP to reconstruct and simulate models of the brain at different levels of detail to study their structure and function

Multi-scale models of plasticity	Scaffold models of brain regions/whole brain ready for community use	To run large-scale detailed model simulations of brain dynamics and plasticity, to embed simplified network models into robots for closed-loop testing, to promote model transformation into neuromorphic hardware	Advanced simulation tools for data-driven modelling and simulation	Brain Simulation Platform - web accessible suite of highly integrated model building and simulation tools backed by HPC computing resources

DEVELOPING TECHNOLOGIES

- STEPS software
- CoreNeuron software
- eFEL software
- SDA: Simulation of Diffusional Association software
- MD-based protocol for in silico drug design
- UQSA: Uncertainty Quantification and Sensitivity Analysis
- Brain Simulation Platform

High-Performance Analytics and Computing Platform

MISSION AND EXPECTED RESULTS

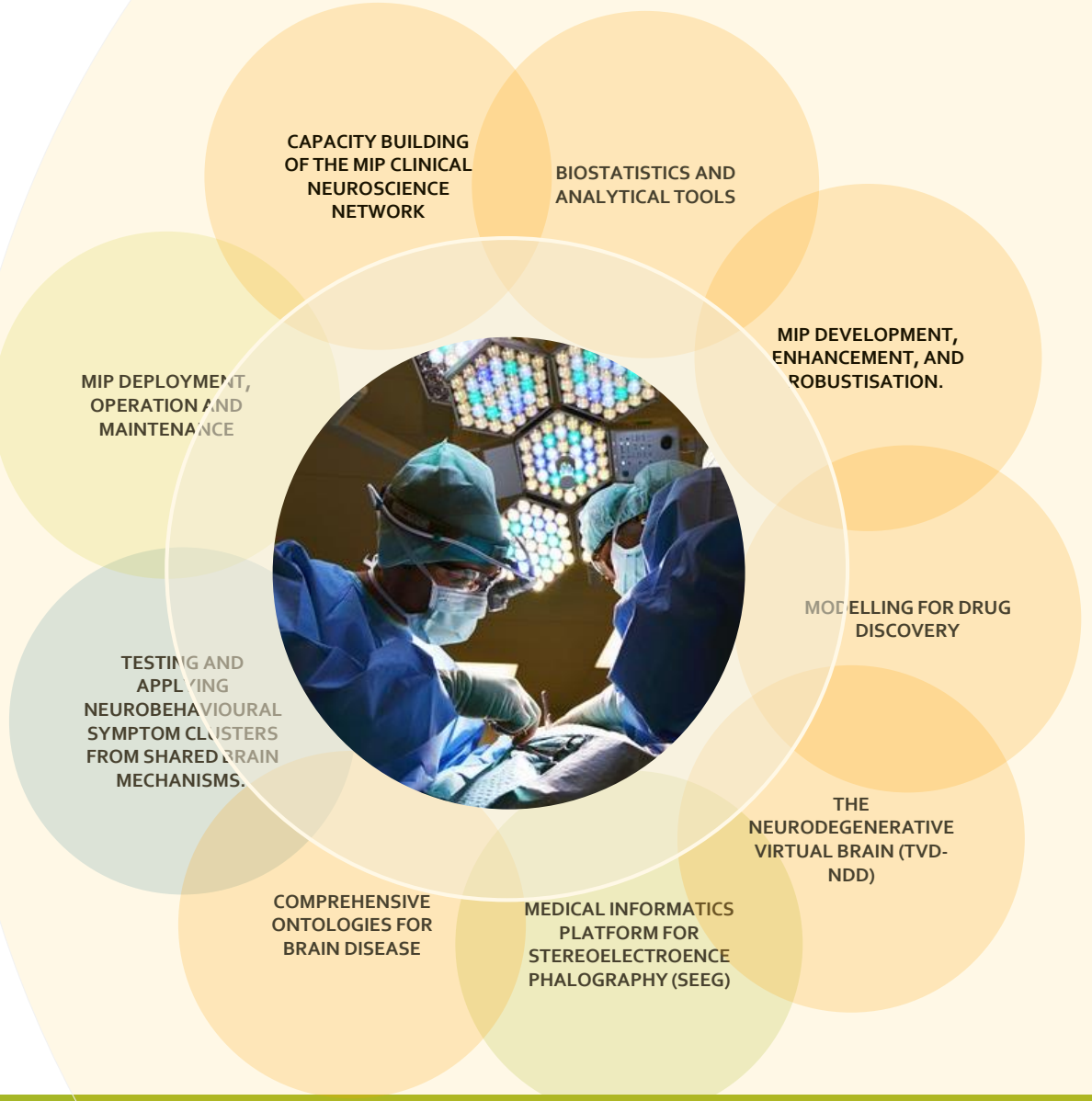
To make huge storage available at four centres in Europe to store the data. We do not only to make this hardware available to the scientists, but also to develop software that supports neuroscientists in their endeavour, e.g. to manage their huge datasets, to simulate models most efficiently on the supercomputers or to look at "visualisations" of the datasets.

Architecture specification for the HPAC Platform and Fenix	Data federation and data-intensive computing technology	Exascale-ready simulation technology: NEST and Arbor	Interactive visual data analytics and in-situ visualization developed and deployed on Fenix and HPAC Platform infrastructure	High Performance Analytics and Computing Platform v3

DEVELOPING TECHNOLOGIES

- SLURM plug-in for the co-allocation of compute and data resources
- Dynamic Load Balancing
- NEST - The Neural Simulation Tool
- ViSTA
- UNICORE
- Qbeast
- High Performance Analytics and Computing Platform

Medical Informatics Platform



MISSION AND EXPECTED RESULTS

Our goal is to provide a collaborative open source platform, the Medical Informatics Platform (MIP), that allows researchers worldwide to share medical data, enabling the use of machine-learning tools for brain-related diseases, while strictly preserving patient confidentiality. A combination of medicine and computer science, we aim to break down barriers between patient care, brain science, and clinical research to minimize the delays involved in diagnosis of brain diseases and institution of the most effective treatments.

MIP infrastructure and operational activities to comply with EU ethics and data privacy/security regulatory requirement

MIP is operated over a large network of European Hospitals (≥ 30)

Established large-scale network of MIP-data providers, including clinical departments and research consortia, collating data from more than 30.000 patients with various brain diseases

MIP analytical tools enable federated analyses of multidimensional longitudinal data for advanced biological disease signature

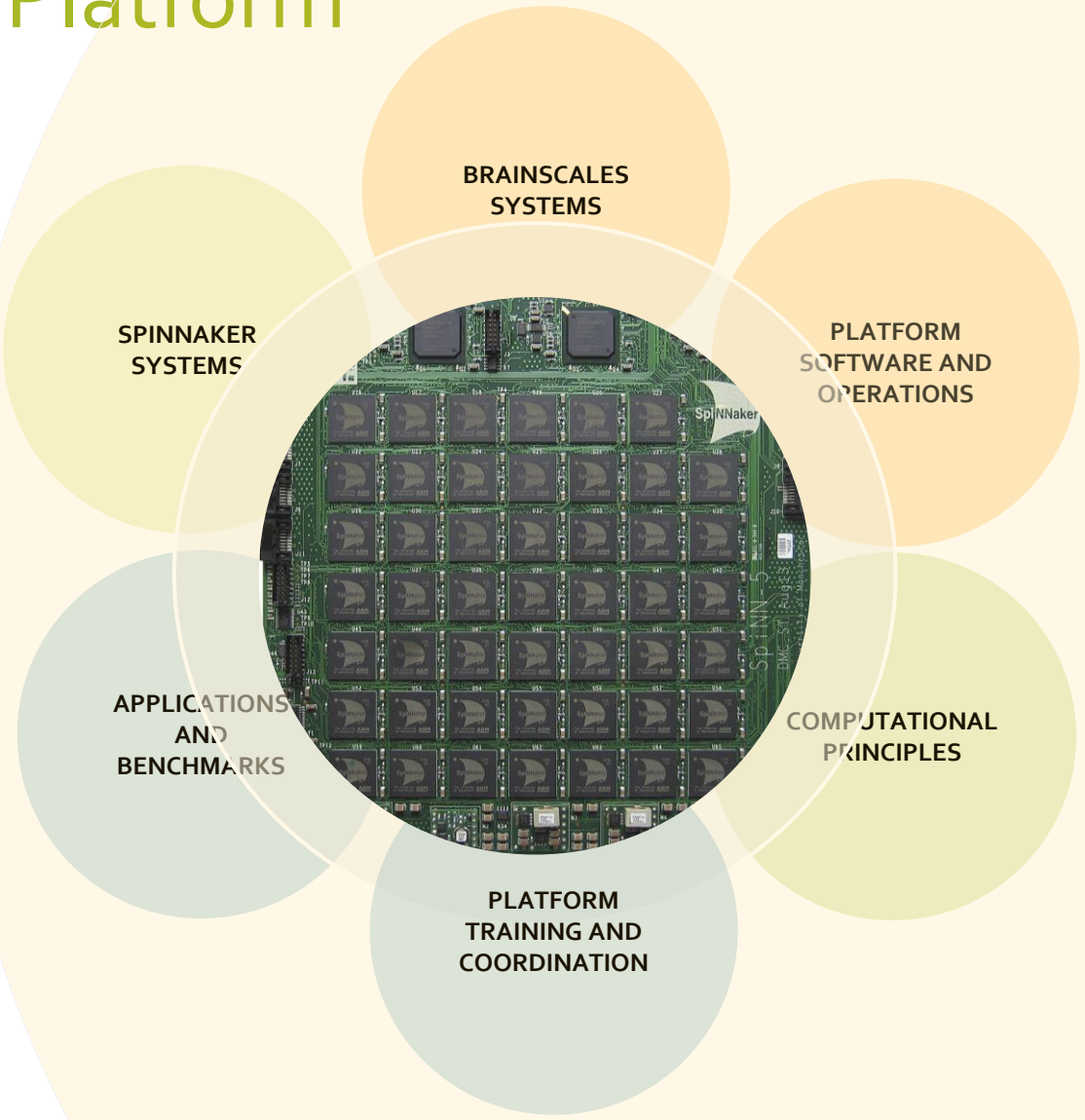
MIP performs advanced automatized extraction of clinical relevant data from hospitals electronic health records (EHR)

DEVELOPING TECHNOLOGIES

Method of preparation and use of phosphoinositide 3-kinase inhibitors in treating cancer

Medical Informatics Platform (MIP)

Neuromorphic Computing Platform



MISSION AND EXPECTED RESULTS

The Neuromorphic Computing Platform takes two fundamentally different paths to support scientific research and applications:

- The BrainScaleS system, based in Heidelberg, employs a mixed signal approach employing analogue electronics to model 4 million neurons and 1 billion synapses, as well as their connections and intercellular communications, using digital communications protocols. It is targeted to the emerging field of bio-inspired AI as well as a better understanding of the learning and development in the brain.

- The SpiNNaker system, based in Manchester, is a massively parallel computing platform, targeted towards neuroscience, robotics and computer science. For robotics, SpiNNaker provides mobile, low power computation, and makes possible the simulation of networks of tens of thousands of spiking neurons, as well as processing sensory input and generate motor output, all in real time and in a low power system.

Both first-generation machines integrated into joint platform

Software suite for the operation of neuromorphic machines

Operational prototype of a second generation BrainScaleS chip featuring on-chip local plasticity and non-linear dendritic processing. Layout of full size second generation wafer ready for immediate production early in SGA3.

Operational prototype of a second generation SpiNNaker chip featuring 10-fold improved energy efficiency, 144 Cortex M4F and 36 GIPS/Watt per chip. Layout and preparation of submission for production of full-size prototype.

Two novel theories of computational principles: Learning-to-learn (L2L) and network learning based on dendritic computation

Applications exploiting the new features of second generation systems.

DEVELOPING TECHNOLOGIES

PyNN

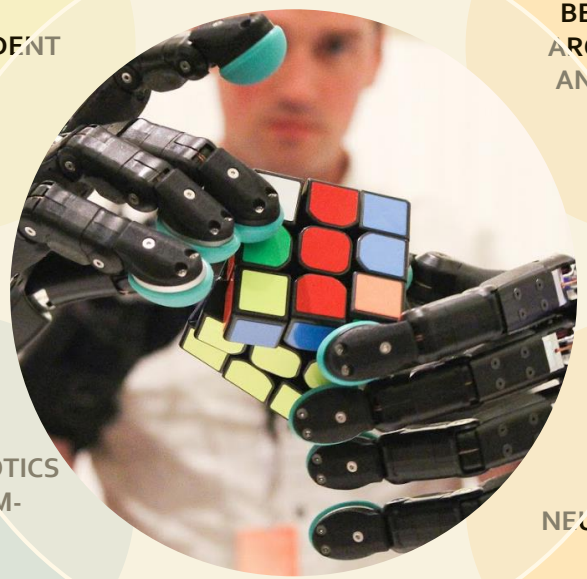
BrainScaleS-1

SpiNNaker-1

22nm test chip JIB1

Neuromorphic computing Platform (BrainScaleS and SpiNNaker)

Neurorobotics Platform



MISSION AND EXPECTED RESULTS

To create an opportunity to give any simulated brain model its own robotic "body" — virtual or even real — that can make it feel as if it had a real body, capable of performing appropriate actions, gathering perceptions and learning. The HBP team has also developed tools to create very detailed simulated environments — "virtual realities" — in which to test brain models and robots. Our tools for creating virtual robots and environments can be found in the Neurorobotics Platform, which is public, online and available to all researchers who wish to test their brain models or build future brain-inspired robots.

Virtual rodent model for *in silico* behaviour experiments

Rodent robot

Integrated Behavioural Architecture (IBA): a common computational framework for closed-loop action perception models in the NRP

Improved NRP: a complete toolchain from detailed brain modelling till testing on a virtual robot with neuromorphic hardware, using SP6, SP5, SP7, SP9 and of course SP10 Platforms.

Modular neural control for physical robots under real-time constraints

DEVELOPING TECHNOLOGIES

Compliant neurorobotics

Neurorobotics platform

Our approach to HBP research groups: updating the HBP offer

1st approach to research groups: Innovation Contacts

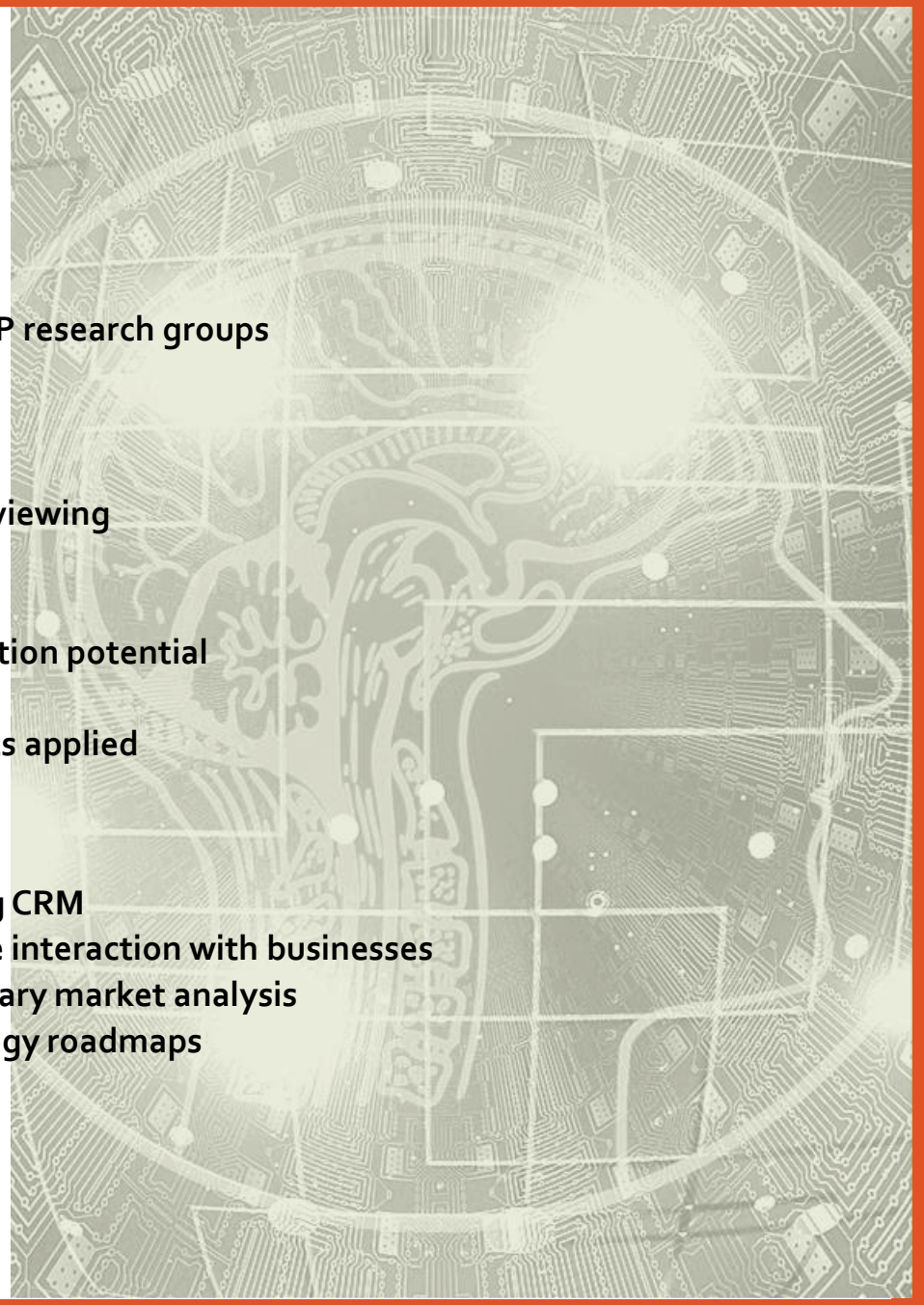
- Identification of key emerging technologies within the HBP research groups
- Questions on technology linkages with other HBP results
- Providing external contacts
- Questions on the future of his/her scientific area
- Nominating other SP researchers and developers for interviewing

2nd approach: other group members

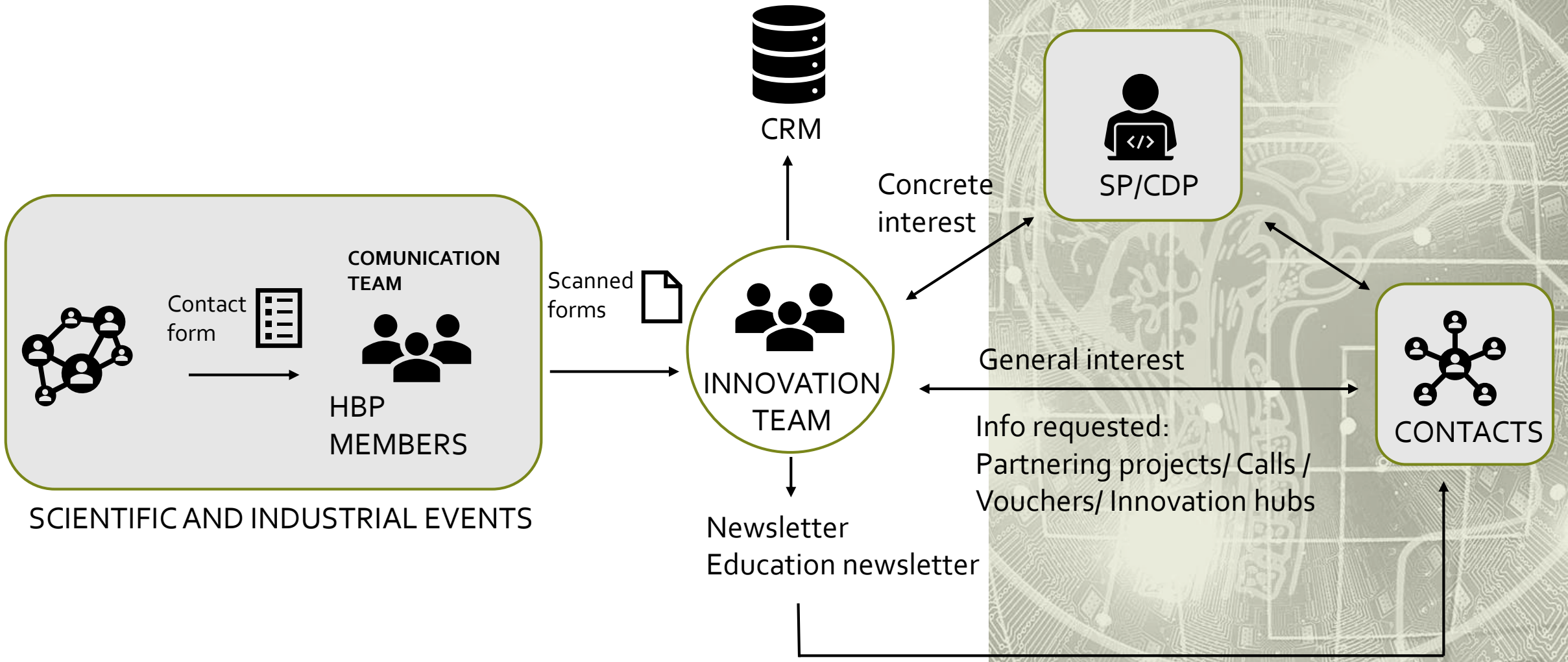
- TRL assessment checklist
- Specific questions on exploitation potential
- Relation with TTOs
- Updating IP status and patents applied
- Training necessities

Updated technology offer

- Updating CRM
- Promote interaction with businesses
- Preliminary market analysis
- Technology roadmaps

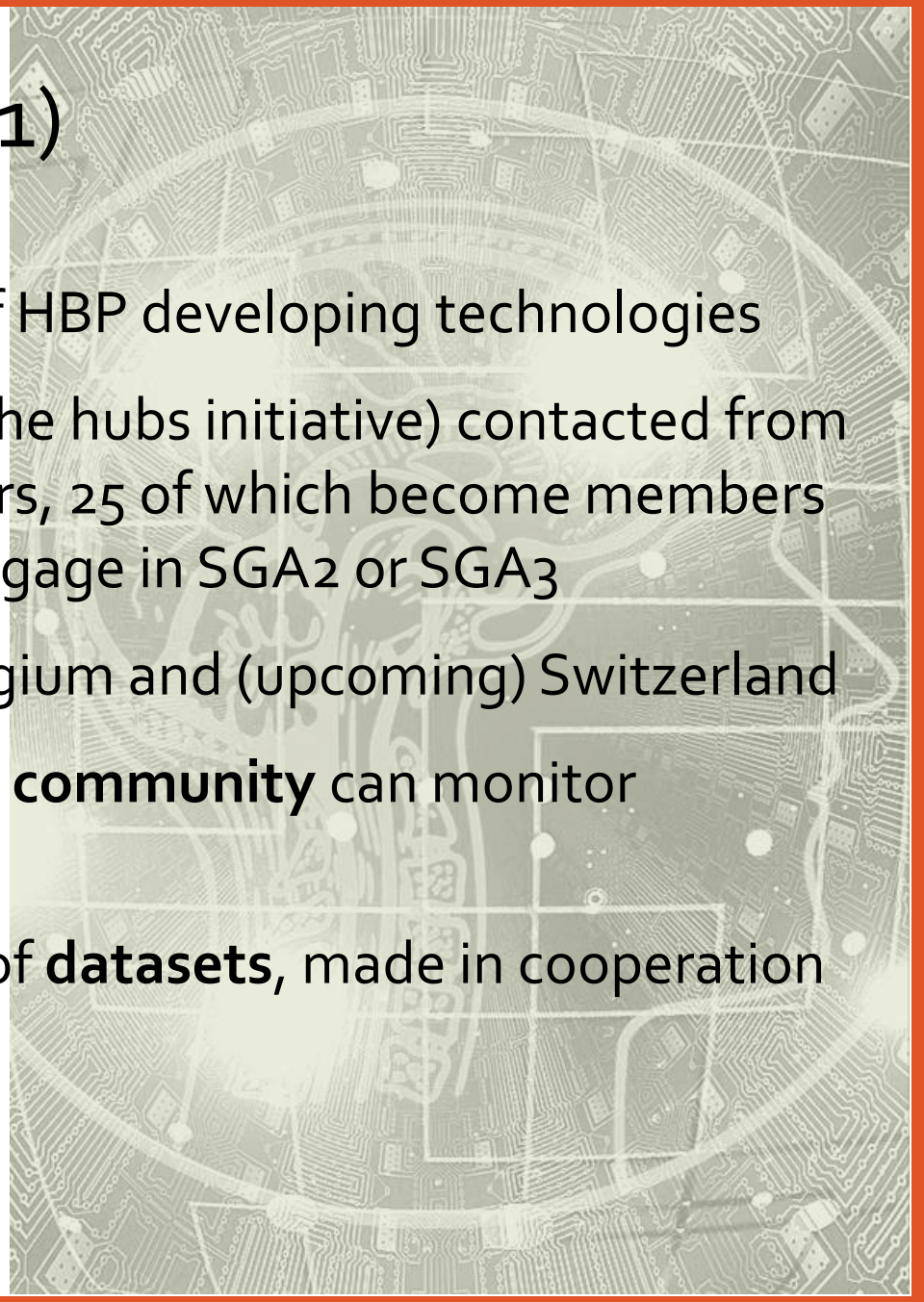


Updating the demand of HBP services and tools



Innovation outcomes during SGA2 (1)

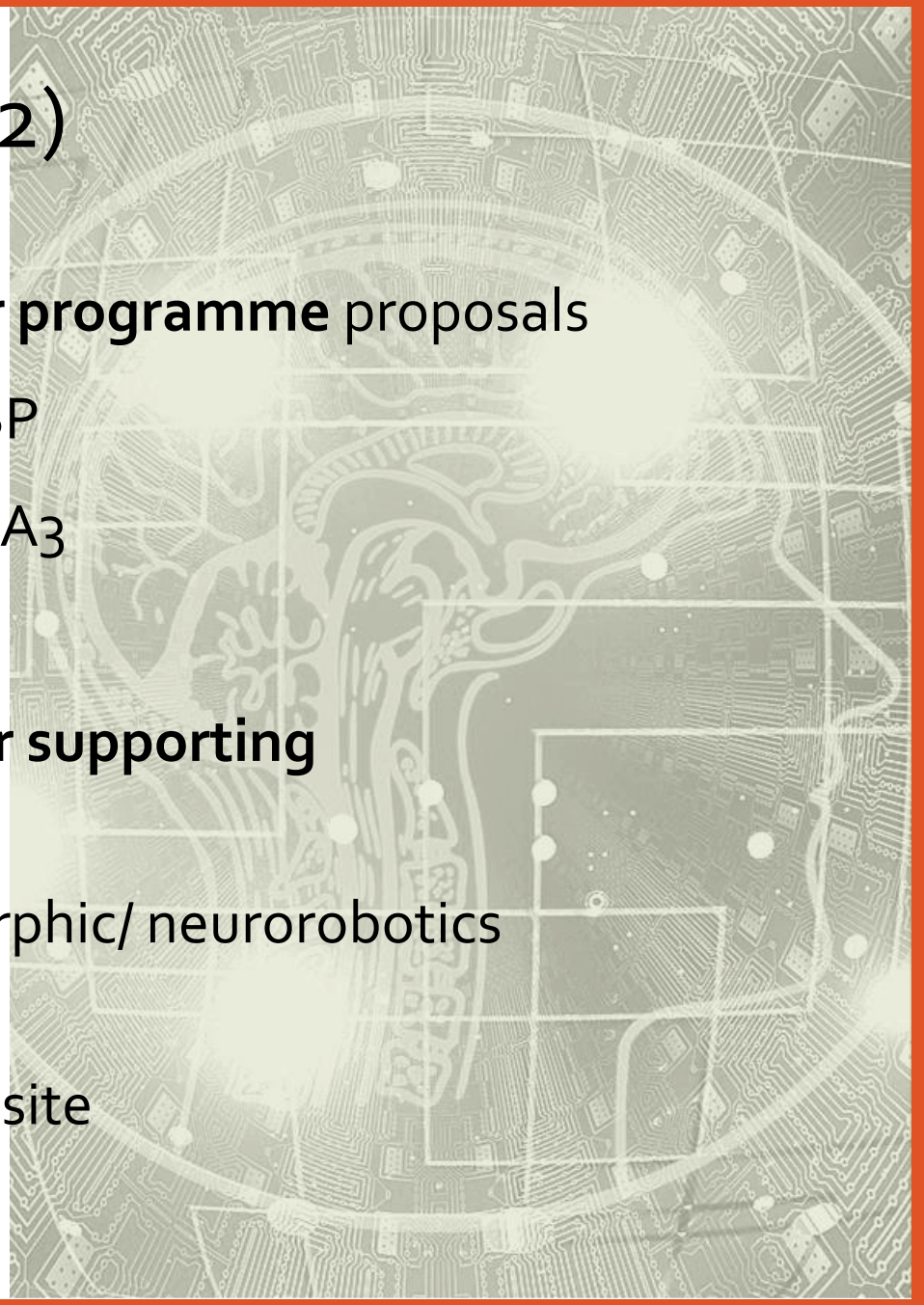
- ✓ **Updating** (depurating, classifying) the database of HBP developing technologies
- ✓ Around **100 companies** (40 from events, 60 from the hubs initiative) contacted from **medical**, **scientific, pharma** and **computing** sectors, 25 of which become members of the hubs (MoU) or expressed their interest to engage in SGA2 or SGA3
- ✓ **Innovation** hubs launched in Spain, (incipient) Belgium and (upcoming) Switzerland
- ✓ **Personalised CRM tool** with which the whole **HBP community** can monitor **matching processes**
- ✓ Adapted TRL **checklist** for assessing the maturity of **datasets**, made in cooperation with SP5, SP2



Innovation outcomes during SGA2 (2)

- ✓ Evaluated the innovation potential of **32 voucher programme** proposals
- ✓ **Roadmapping** software tool to be adopted in HBP
- ✓ Delivered an **Exploitation plan** for SGA2 and SGA3
- ✓ Updating **HBP patents** database
- ✓ Informed HBP partners on **innovation funding or supporting opportunities**, e.g. EIT Health
- ✓ **Roadmap** and **market analysis** of HBP neuromorphic/ neurorobotics technologies
- ✓ Creation of the **innovation page** in the HBP web site

Link to the innovation website



INNOVATION IN HBP

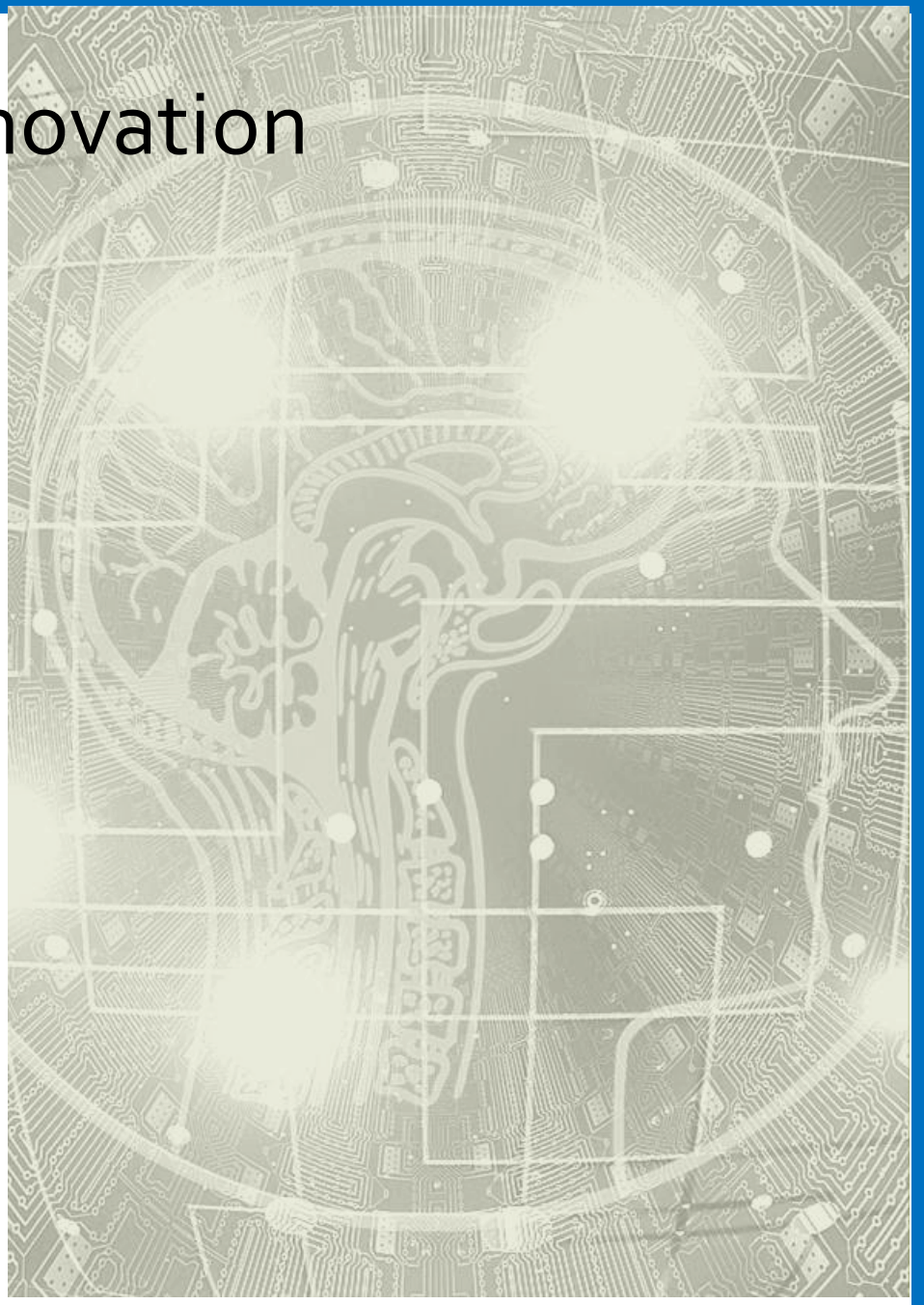
HBP Spanish Hub Workshop

ENGAGING WITH HBP RESEARCH AND INNOVATION

Engaging with HBP research and innovation

Vouchers

- The vouchers give researchers outside the Project access to the HBP **infrastructure services** and its **engineers**
- With the help of the engineers, the voucher winners will implement new infrastructure capabilities to solve specific problems **not covered** by the current RI toolset.
- The focus is on projects that will be relevant for using and/or contributing to the further **development** of the **HBP research infrastructure**.



Engaging with HBP research and innovation

Vouchers Apply for a Research Infrastructure Voucher in 2020

- You want the HBP engineers to develop a new application for the HBP infrastructure that will advance your research.
- You are a researcher, academic or non-academic, or from hospital, industry or pharma.
- Neither you nor your group is funded by HBP.

A voucher is worth of 12 person months of HBP developer/engineer time.

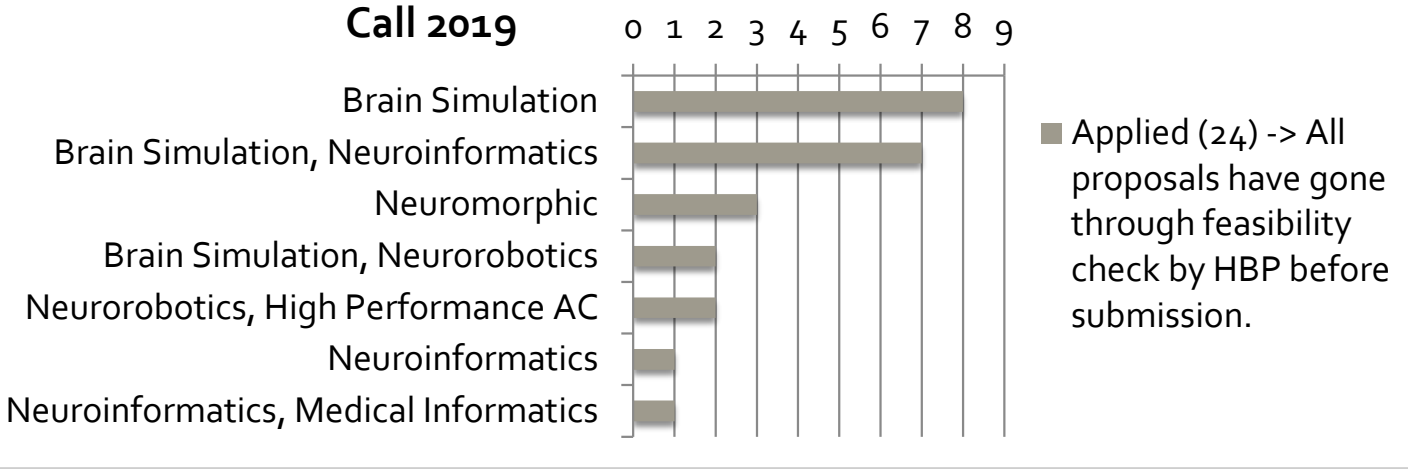
The next call for voucher proposals is in planning for 2020.

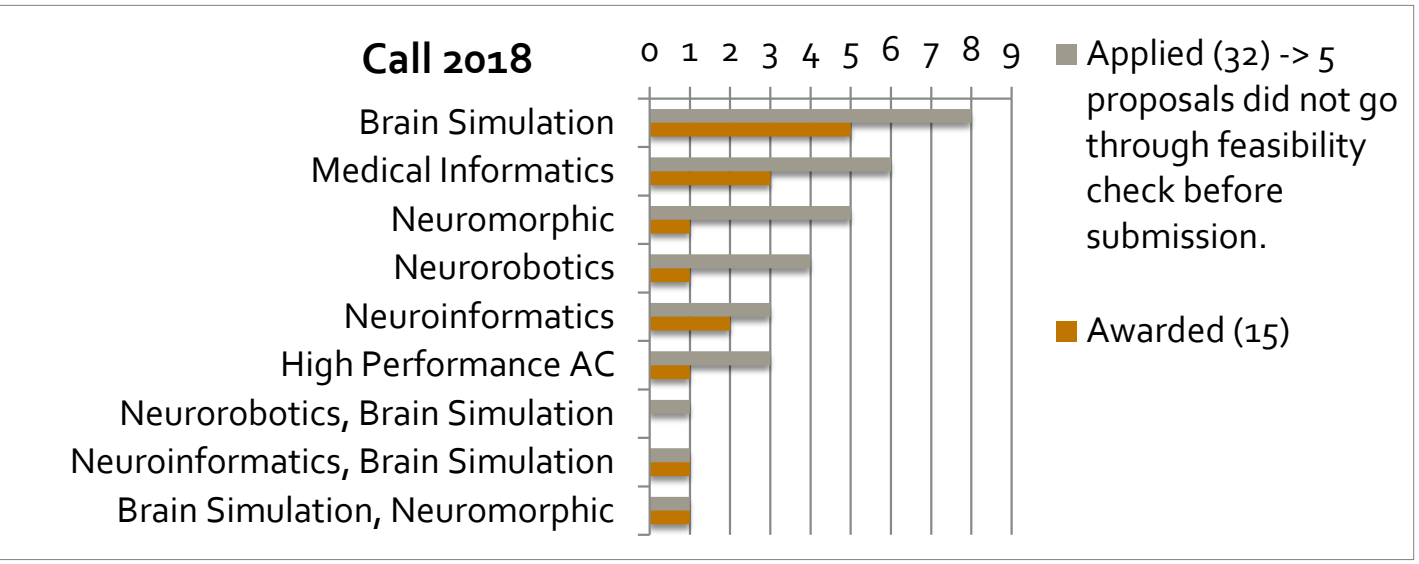
www.humanbrainproject.eu/en/collaborate/open-calls

vouchers@humanbrainproject.eu

Engaging with HBP research and innovation

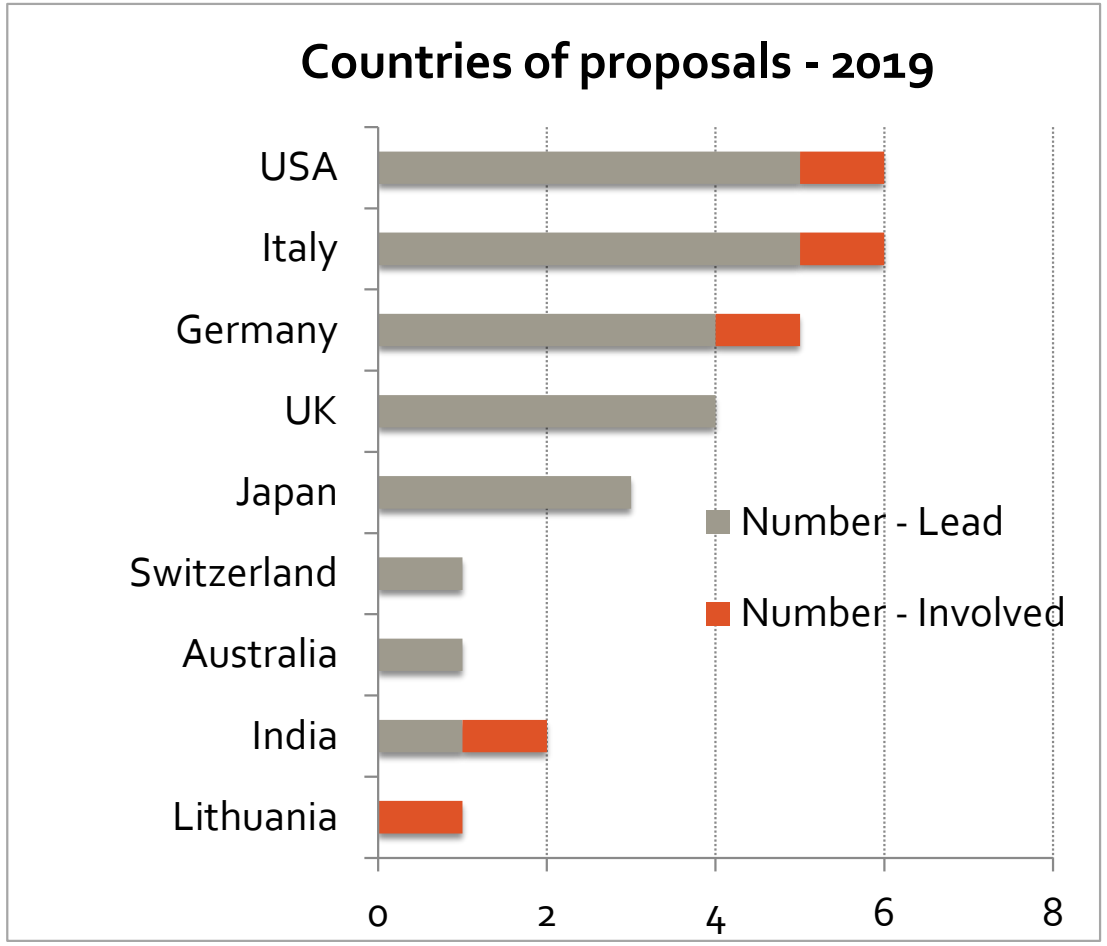
Vouchers Number of Proposals per Platform or Combination of Platforms

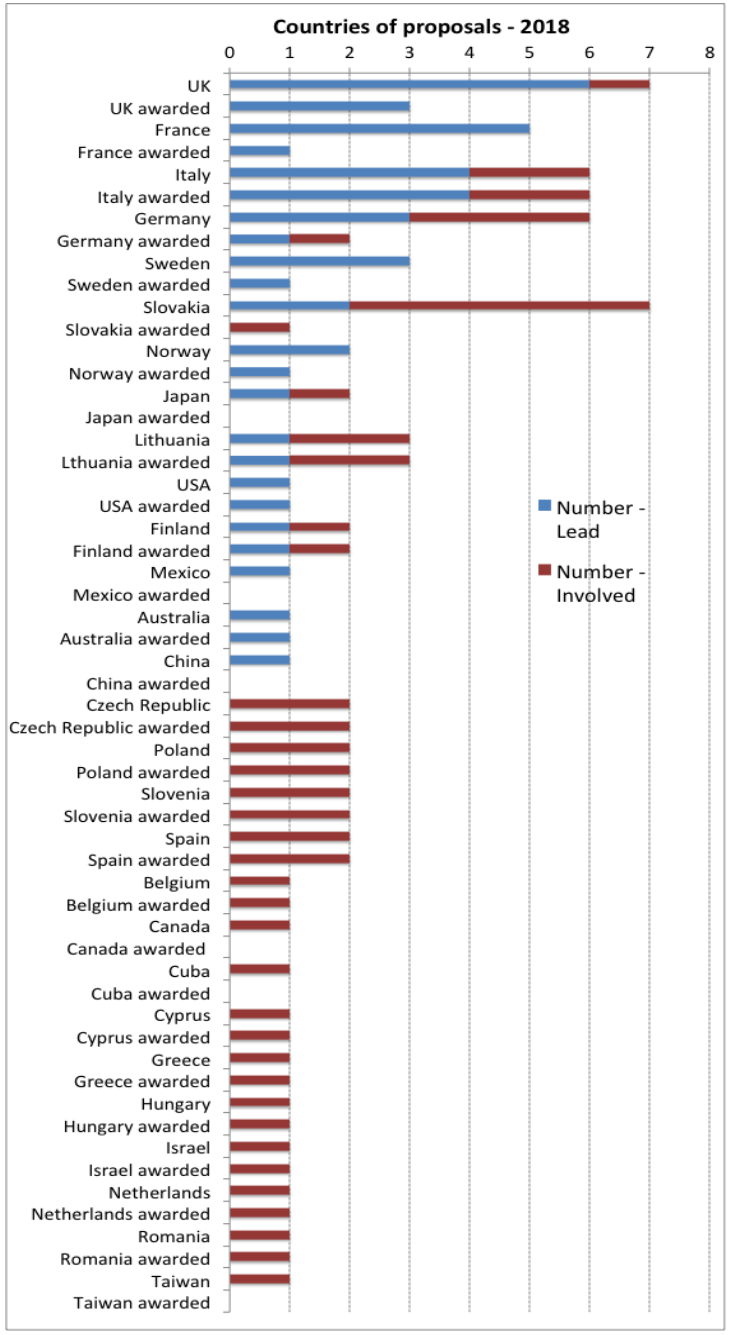




Engaging with HBP research & innovation

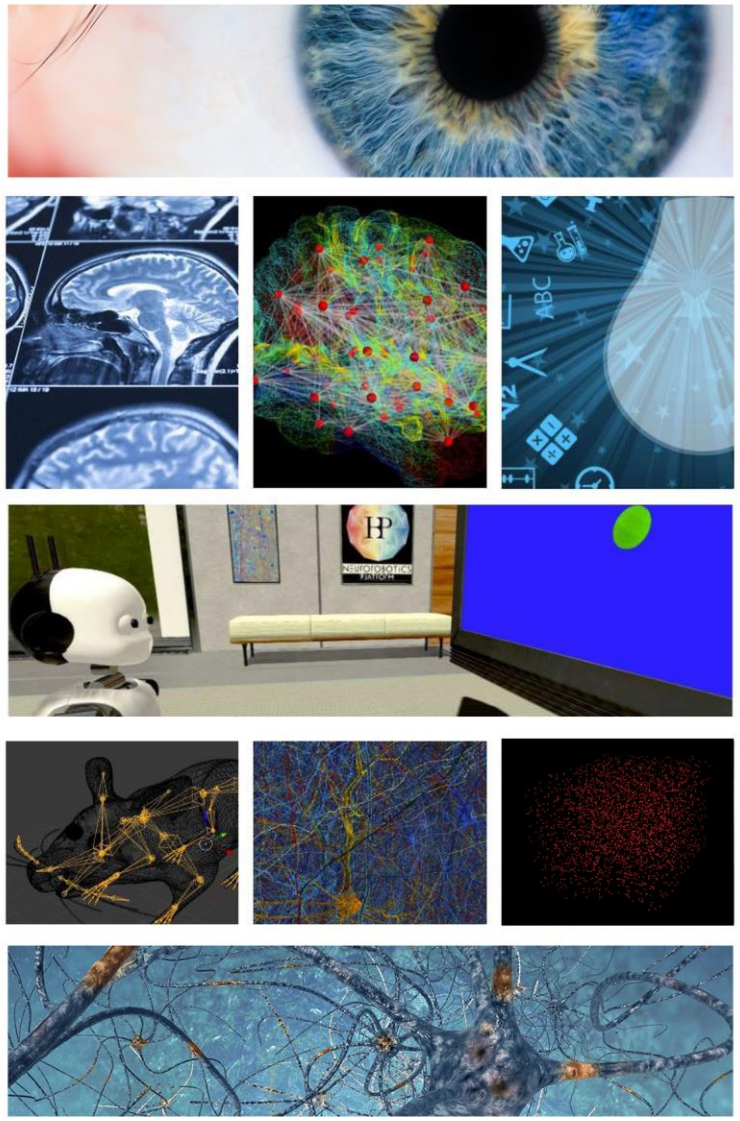
Vouchers Geographical Distribution of Applicants





2019: The applicants (52) come from 9 countries.
2018: The applicants (27) came from 27 countries.

Engaging with HBP research and innovation



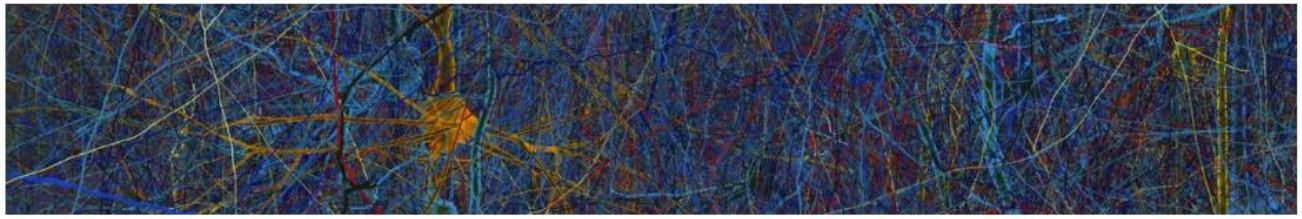
Nine **Calls for Expression of Interest** (CEoIs) were recently launched for new projects to directly contribute to the development of the research Infrastructure (EBRAINS) and increase the scope of its application in terms of innovation, neuroscience and clinical research.

1. Validation and Inference
2. Brain atlas and simulation engine adapter construction
3. Whole brain multi-parametric imaging using invasive and non-invasive recordings
4. Rodent microcircuits
5. Cellular Level Models For HPC Simulation
6. Visual scene understanding models for robotics use-cases
7. Integration of symbolic processing into cognitive architectures
8. Data and models for studying the neural basis of cognition
9. Data and models for the understanding of consciousness

The CEoIs are for external applicants outside the current HBP Consortium or not currently involved in the HBP

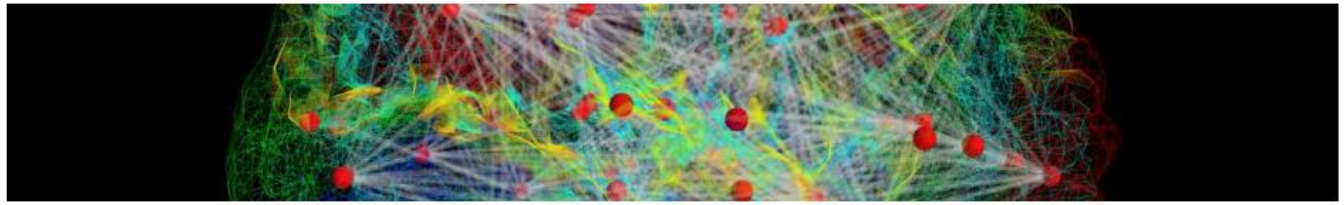
Engaging with HBP research & innovation

CEoI 1: Validation and Inference

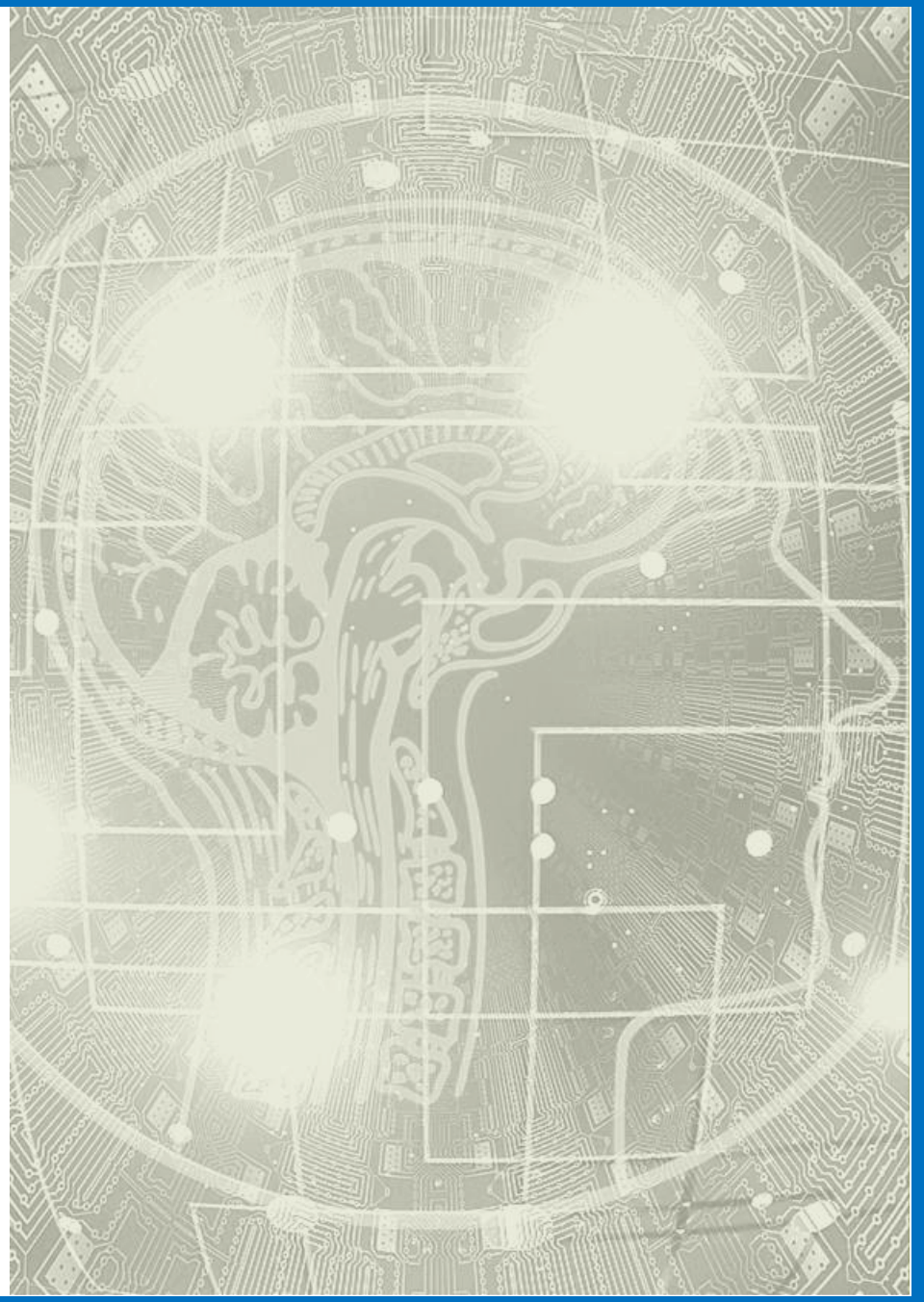


The goal of the specific CEoI is to attract experts in model validation to independently validate the brain models against available experimental evidence. The budget is EUR 700,000 for 1 proposal. The pre-proposal submission deadline is 04.11.2019 16:00 UTC (17:00 CET). The proposal submission deadline is: 02.12.2019 16:00 UTC (17:00 CET).

CEoI 2: Brain atlas and simulation engine adapter construction



The goal of the specific CEoI is to attract experts in computational services related to the informatics integration of Brain Atlas and The Virtual Brain. The budget is EUR 450,000 for 1 proposal. The pre-proposal submission deadline is 04.11.2019 16:00 UTC (17:00 CET). The proposal submission deadline is: 02.12.2019 16:00 UTC (17:00 CET).



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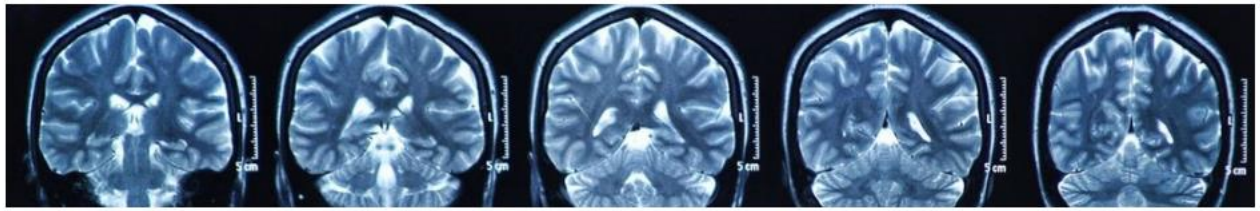
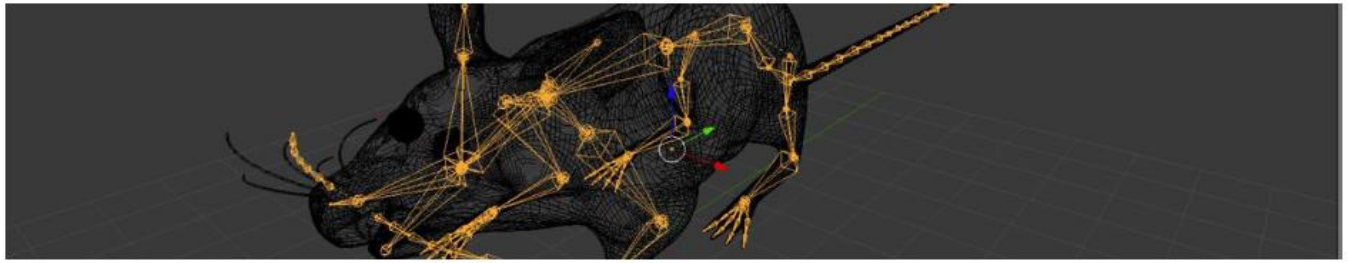
CEoI 3: Whole brain multi-parametric imaging using invasive and non-invasive recordings



The goal of the specific CEoI is to attract experts in the field of multimodal multiparametric brain imaging across scales. The budget is EUR 450,000 for 1 proposal. The pre-proposal submission deadline is 04.11.2019 16:00 UTC (17:00 CET). The proposal submission deadline is: 02.12.2019 16:00 UTC (17:00 CET).

CEoI 4: Rodent microcircuits



The goal of the specific CEoI is to attract experts in the field of rodent microcircuit modelling for across-scales methodological validation. The budget is EUR 900,000 for 1 proposal. The pre-proposal submission deadline is 04.11.2019 16:00 UTC (17:00 CET). The proposal submission deadline is: 02.12.2019 16:00 UTC (17:00 CET).

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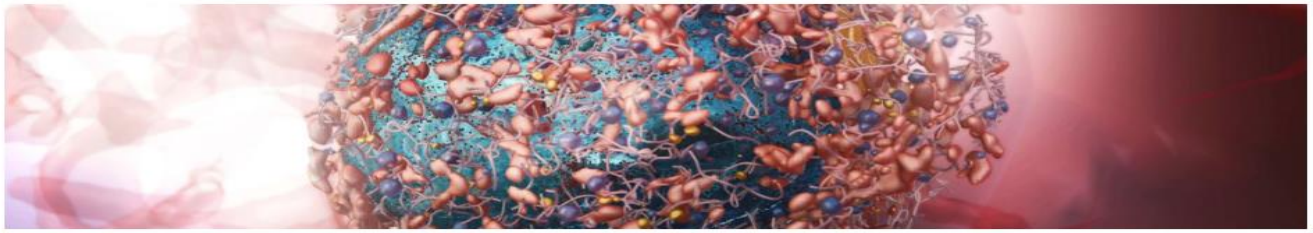
CEoI 5: Cellular Level Models For HPC Simulation Call



A Call for Expression of Interest (CEoI) is now open for organisations interested in preparing cellular-level models for portable high-performance computing (HPC) simulation using Arbor: "Preparing Cellular-Level Models for Portable HPC Simulation using Arbor"

The budget is EUR 900,000 for 2 proposals. The pre-proposal submission deadline is 06.11.2019 16:00 UTC (17:00 CET). The proposal submission deadline is: 04.12.2019 16:00 UTC (17:00 CET).

CEoI 6: Application of visual scene understanding models to robotics use-cases of industrial relevance

This CEoI is for Organisations or groups of Organisations interested in applying techniques in visual scene understanding to robotics applications of industrial relevance. The budget is EUR 800,000 for 1 proposal. The pre-proposal submission deadline is 07.11.2019 16:00 UTC (17:00 CET). The proposal submission deadline is: 05.12.2019 16:00 UTC (17:00 CET).

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CEoI 7: Integration of symbolic processing into the cognitive architectures

This CEoI aims to integrate expertise of neural network modelling of high-level symbolic processing for integration in developed biologically inspired cognitive architectures. The budget is EUR 800,000 for 1 proposal. The pre-proposal submission deadline is 07.11.2019 16:00 UTC (17:00 CET). The proposal submission deadline is: 05.12.2019 16:00 UTC (17:00 CET).

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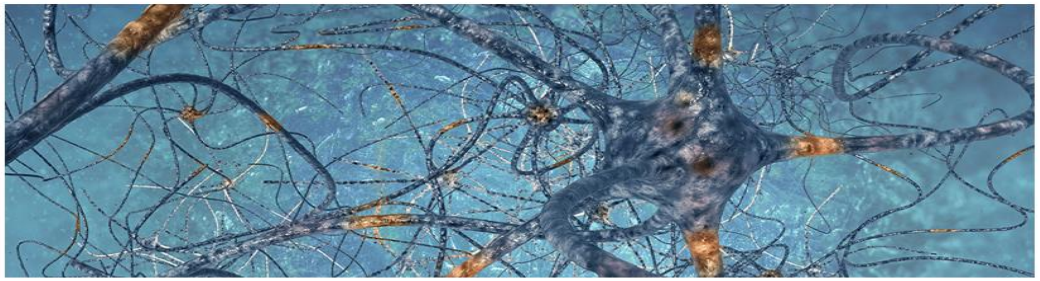
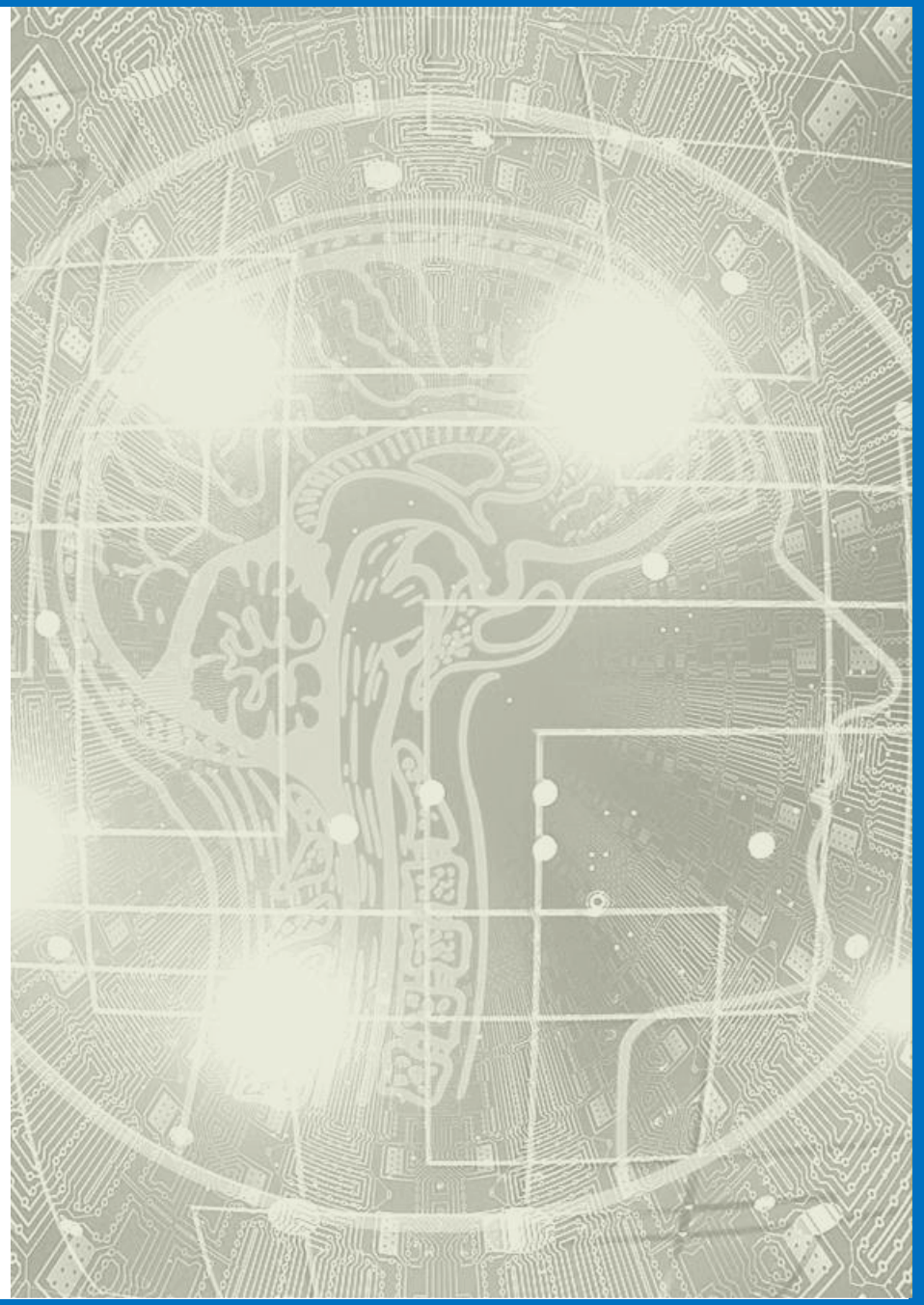
CEoI 8: Data and models for studying the neural basis of cognition



This CEoI is meant to attract leading organisations interested in gathering data which inform the neural basis of cognition, and in data-driven modelling of cognitive processes. The budget is EUR 1,300,000 for 1 proposal. The pre-proposal submission deadline is 13.11.2019 16:00 UTC (17:00 CET). The proposal submission deadline is: 11.12.2019 16:00 UTC (17:00 CET).

CEoI 9: Data and models for the understanding of consciousness

This CEoI is meant to attract leading organisations interested in gathering and bringing into HBP experimental and clinical data, computational models and theoretical work which inform the neural basis of consciousness as the basis for cognition. The budget is EUR 800,000 for 1 proposal. The pre-proposal submission deadline is 13.11.2019 16:00 UTC (17:00 CET). The proposal submission deadline is: 11.12.2019 16:00 UTC (17:00 CET).



INNOVATION IN HBP

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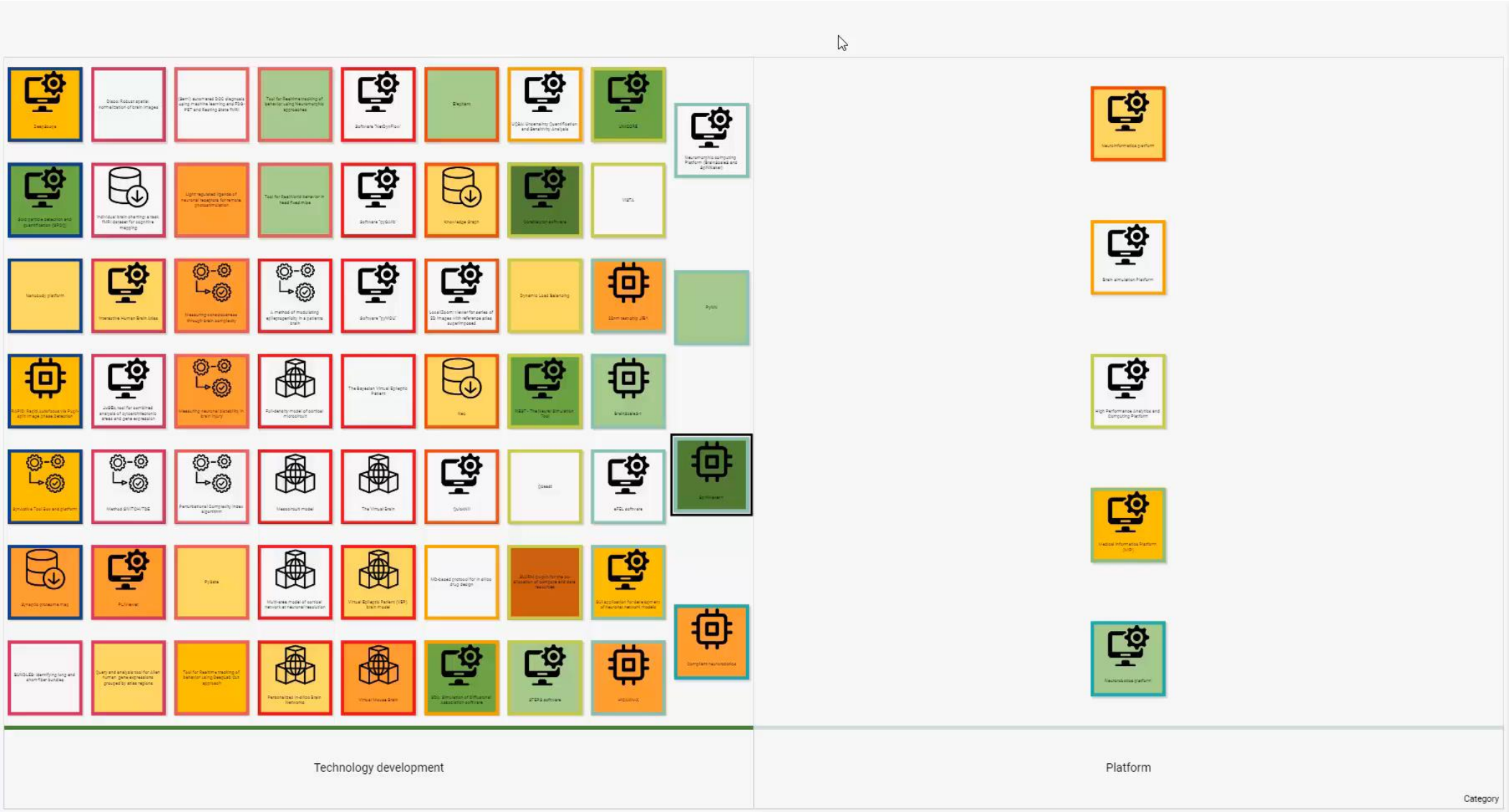
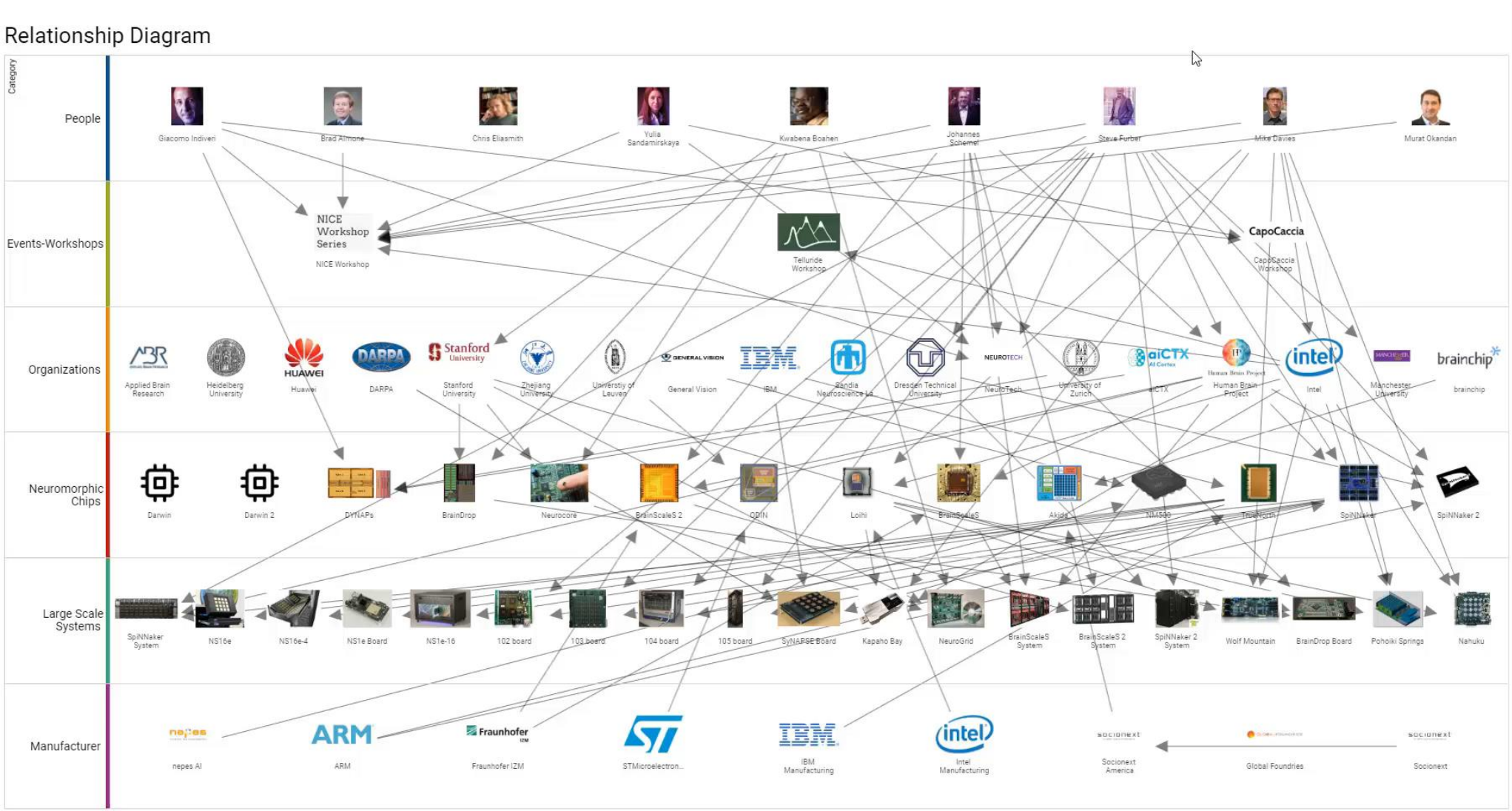
AN OVERVIEW OF HBP TECHNOLOGIES

Our developing technologies in a nutshell



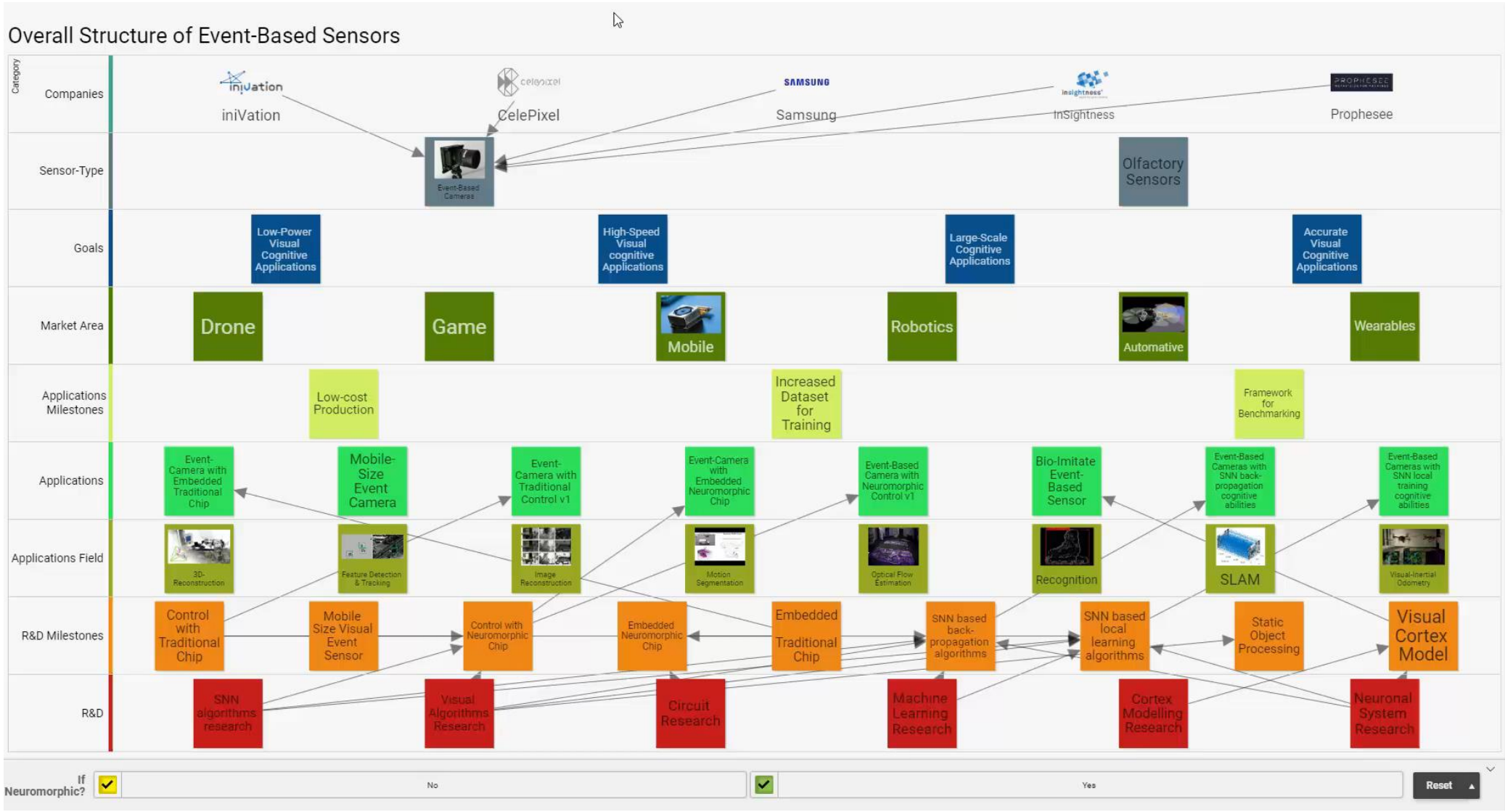
Link to the roadmap

Our Neuromorphic computing analysis and roadmap



Link to the roadmap

Event-based sensors roadmap



Link to the roadmap

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TOWARDS 2023: INNOVATION IN THE SGA3 PHASE

Towards 2023: the SGA3 phase of HBP

The consortium has prepared the **SG3 proposal for evaluation** from the European Commission

- Final proposal was submitted 1st October 2019

Main issues

Period: April 2020 to March 2023
Funding from EC: €150 million

Relevant aspects

- ✓ Simpler HBP structure (fewer work packages)
- ✓ Strong emphasis on the HBP research infrastructure (**EBRAINS**)
  - ✓ Mature and integrated tools offered to EBRAINS community
- ✓ Neuroscience focused on human brain
  - Mainly supported by collaborative projects funded by national and regional agencies
- ✓ More resources for **innovation** activities
  - Exploitation of research results
  - Industrial use of the EBRAINS services

Towards 2023: the SGA3 phase of HBP

BUSINESS DEVELOPERS

INNOVATION TEAM

- Exploitation of EBRAINS
- Business Dev. support
- National innovation communities
- Innovation calls

USERS´COMMUNITIES

SCIENCE

- SC1: EBRAINS FAIR data services
- SC2: Brain atlas services
- SC3: Brain modelling and simulation
- SC4: Closed loop AI and robotics
- SC5: Medical brain activity data platform
- SC6: Interactive workflows on HPC or NMC

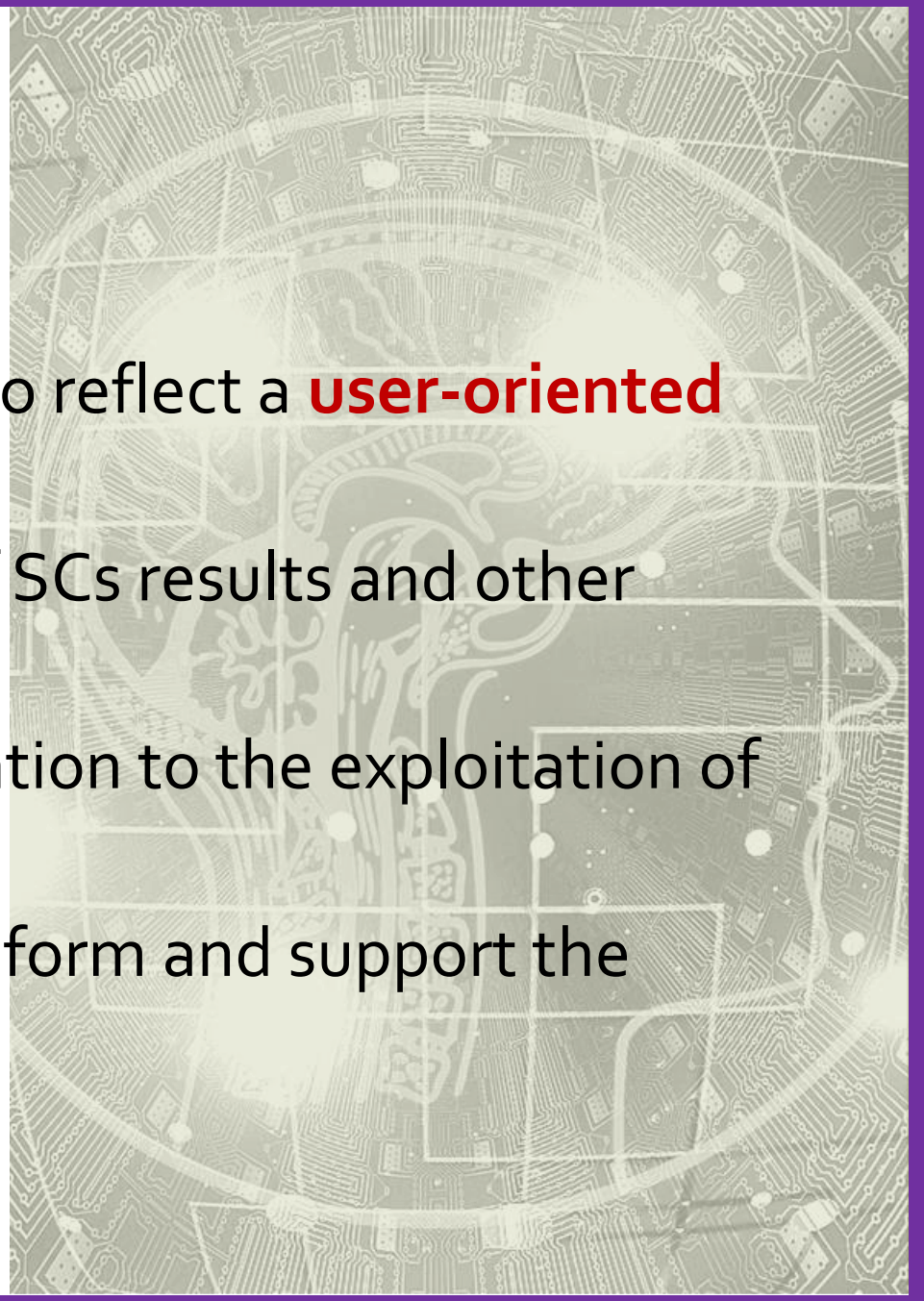
INDUSTRY

NIC NIC NIC NIC

Towards 2023: the SGA3 phase of HBP

Task 8.5 Exploitation of EBRAINS

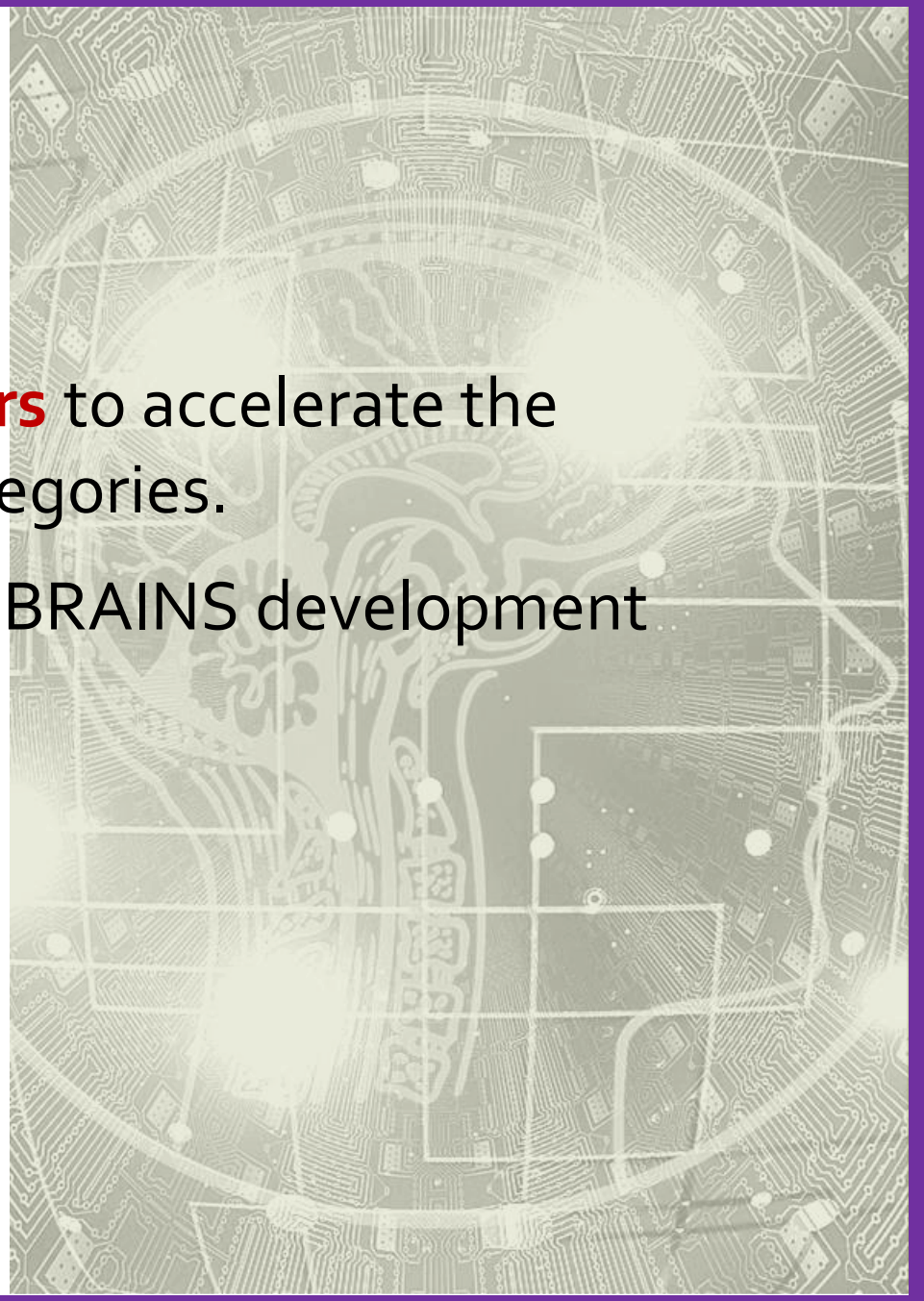
1. Monitor and update the Exploitation Plan to reflect a **user-oriented approach to EBRAINS**
2. Develop **market analysis** and **roadmaps** of SCs results and other HBP exploitable technologies.
3. Reinforce the **business developers**' orientation to the exploitation of EBRAINS
4. Match HBP results with **market needs** to inform and support the business developers' work.



Towards 2023: the SGA3 phase of HBP

Task T8.6 Business Developers

1. Develop a network of **business developers** to accelerate the exploitation of the EBRAINS Services Categories.
2. Align HBP **exploitation** activities to the EBRAINS development process.



Towards 2023: the SGA3 phase of HBP

Task 8.7 National innovation communities

- Launch six HBP **National Innovation Communities** in Europe
- Evaluate the socio-economic **impact** of National Innovation Communities

Towards 2023: the SGA3 phase of HBP

Task 8.8 Calls for Industry Engagement

- This open Call for innovation will engage HBP with industry, mainly **technology-based SMEs, in cooperation with HBP partners**, to increase the functionality of EBRAINS services categories and to speed up the movement to the market of HBP results
- The Call is conceived as **two steps**:
  - ✓ The first short step provides support to selected HBP partners in cooperation with one SME to develop a **feasibility study** to offer solutions to users through EBRAINS
  - ✓ Then, a smaller number of projects will be selected for the second phase where more time and additional resources will be allocated to SMEs **to complete the planned activities.**

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FINAL REMARKS

- AFTER YEARS OF INTENSIVE RESEARCH, HBP IS FACING THE EXPLOITATION ´MOMENTUM´
- EBRAINS TOOLS AND SERVICES ALREADY SUPPORT AND ACCELERATE NEUROSCIENCE COMMUNITIES´ WORK
- INDUSTRIES, IN PARTICULAR SMES, ARE VERY WELCOMED TO JOIN US AND TOGETHER EXPAND EBRAINS SERVICES (VOUCHERS AND CALLS)
- NATIONAL INNOVATION COMMUNITIES (HUBS) ARE AN EXCELLENT FORM OF ENGAGING AND INTERACTING WITH HBP
- THE INNOVATION TEAM IS PLEASED TO HELP YOU TO KNOW MORE ON HBP RESULTS AND CONNECT YOU WITH HBP MEMBERS WITH WHICH YOU LIKE TO EXPLORE FUTURE COLLABORATION

INNOVATION IN HBP
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THANK YOU

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the European Union