Data sharing made easy

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incf

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The FAIR roadmap for neuroscience

The FAIR roadmap project, led by the INCF Council for Training, Science, and Infrastructure (CTSI), is an ambitious project that aims to provide a global plan for how to move neuroscience towards a more open, FAIR, and citable discipline. The roadmap is a living document that is intended to serve as a framework for identifying the current gaps, challenges, and opportunities in the landscape of open, FAIR, and citable neuroscience, as well as a framework for coordinating community action.

The current areas of work include:
- data aquisition
- data modeling
- long-term data archiving and curation
- data processing and interpretations
- publishing
- neuroethics

In addition to developing the roadmap, the project will also create portfolios of existing tools and resources that facilitate open, FAIR, and citable neuroscience. The current portfolio includes:
1. Principles of FAIR data management
2. FAIR standards and best practices portfolio
3. FAIR repositories and scientific gatways portfolio

Are you interested in learning more about FAIR and looking to gain an understanding of how to implement the FAIR Guiding Principles in your research? Visit these study tracks on INCF TrainingSpace:
- Introduction to FAIR neuroscience: bit.ly/IntroToFAIRNeuro
- Open neuroscience starter kit: bit.ly/OpenNeuroSK

Find out more: incf.org/incf-fair-roadmap
If you have questions about the SBP process, please contact us at info@incf.org

INCF Training Suite

The INCF Training Suite is a collection of open access platforms that aims to facilitate self-guided study in the sub-specialisms of neuroscience with an emphasis on neuroinformatics. The INCF Training Suite acts as a framework for integrating and making neuroscience related training materials FAIR and more accessible to the global neuroscience community.

The INCF Training Suite currently consists of TrainingSpace, Neurostars and KnowledgeSpace. These platforms provides users with access to:
- multimedia educational content from courses, conference lectures, and laboratory exercises from some of the world's leading neuroscience institutes and societies
- study tracks to facilitate self-guided study
- tutorials on tools and open science resources for neuroscience research
- a Q&A forum
- a data discoverability portal and encyclopedia that provides users with thousands of publicly available neuroscience datasets and abstracts in PubMed

> Do you need a platform to disseminate your educational materials and tutorials for your project or tool? Contact the Secretariat to learn how your project can leverage the INCF TrainingSuite: info@incf.org

TrainingSpace (TS) is an online hub that makes multimedia educational content from courses, conference lectures, and laboratory exercises from some of the world's leading neuroscience institutes and societies more accessible to the global neuroscience community. TS provides users with study tracks for self-guided study, tutorials on tools and open science resources for neuroscience research. training.incf.org

KnowledgeSpace (KS) is a globally-used, data-driven encyclopedia and search engine for the neuroscience community. Descriptions of neuroscience research concepts, publicly available datasets, publications, and more can be discovered across a variety of resources through KS. knowledge-space.org

Neurostars is an open access question and answer site that serves the INCF network and the global neuroscience community as a forum for knowledge exchange between neuroscience researchers at all levels of expertise, software developers, and infrastructure providers. neurostars.org

Neurobot

Neurobot is a web based application for simplifying data sharing and metadata management for research. Most clinical data management tools are designed for efficient data acquisition and data processing; however, they often lack a usable data access interface. Neurobot, a lightweight data sharing application, was developed to provide a user-friendly data access interface that can be used for sharing a wide variety of versioned datasets.

Study data managers Neurobot offers an easy to use front-end to upload and manage clinical data, dictionaries, and any other documentation about the data. Personalized data access permissions can be configured, thus allowing managing sub-studies under the same deployment.

Researchers Neurobot allows free text search over the data and metadata to find the right data elements and download them; it also lets them create subsets of data that can be shared with other users or even add it to their publication.

Platform administrators Neurobot makes it easier for platform administrators to create data managers and control their access to different datasets. They can also compile and compare metadata across multiple studies.

Key features

- **Data dictionary** A dictionary is generated for the data uploaded in Neurobot that can be used to describe the data elements.
- **Share data** Datasets from the study can be easily shared with researchers all managed through a friendly user interface.
- **Find data** Researchers can easily find the data elements without going through lengthy manuals.
- **User management** Study administrators can control the user permissions on datasets using a fine grained access control system.
- **Saved search** Subset of data selected can be saved in user space for sharing with collaborators or reuse for analysis pipelines.
- **API access** Besides the front end application, users can also use API to fetch latest data for their analytic pipelines or scripts.

Learn more about this great resource:

incf.org/resources/tools/neurobot

Affiliated with

Working Groups

Working Groups (WGs) are composed of users and developers from across the INCF network working collaboratively to develop, refine, and/or implement community standards. WGs represent short-term projects that aim to achieve a concrete deliverable. The WGs also serve as forums for getting agreement and community buy-in on the use of these standards and best practices. All community members are welcome to be WG members, regardless of their location in the world. INCF gives support with group communications, coordination between groups, and assistance with logistics and outreach.

The Working Groups
- establish a work plan and budget to accomplish its mission or task. This must include a plan for gathering appropriate input from the membership and the community.
- provide quarterly reports to the INCF Secretariat on its progress.
- use the INCF website to provide access to publicly available documents, such as the work plan, committee minutes, selected working documents, and public presentations.
- work with the INCF Secretariat to keep the membership and community aware of its progress.
- review all comments made from the CTSI and any public comments received from INCF public review on all its work.
- recommend that they be disbanded when work is complete, if they determines that they cannot complete their work in a timely fashion, or if they determine that their work no longer fits INCF's standards and best practices program. In the case of discontinuance of a standards/best practices project, a written justification for such an action shall be sent to the CTSI and the INCF Secretariat.

Some of our Working Groups include projects on:
- ARTEM-IS
- eCobidas
- computational neuroscience software
- standardized data
- electrophysiology stimulation ontology
- neuroinformatics for aging
- open SHACL schema for FAIR neuroscience data
- reproducibility and best practices in human brain imaging
- standardized representations of network structures
- neuroimaging quality control

See which Working Groups are actively seeking new members: incf.org/resources/working-groups

Mentorship programs

Google Summer of Code

Google Summer of Code (GSoC) is a global program focused on bringing new developers into open source software development. Since 2011, the INCF network has served as a mentoring organization that pairs GSoC candidates with developers from its community to work on 3-month programming projects. GSoC contributors are paid a stipend by Google. Between 2016 and 2023, INCF paired 168 contributors with 233 mentors.

Learn more incf.org/activities/gsoc

How to apply Send an expression of interest identifying one or more specific toolboxes of interest and a recent CV to greg@incf.org


MATLAB Community Toolbox Training Projects

In 2022, the neuroscience team at MathWorks began supporing mentored and paid early-career code contribution projects to a MATLAB community toolbox - an open-access MATLAB code repository - which serves neuroscience users and use cases.

By 2023, all projects have begun using GitHub as a platform and each of the trainees worked towards one or more pull requests containing their code contributions. Many of these pull requests have been incorporated into the main code branches for the MATLAB community toolbox, meaning their training experiences have translated into real-world impacts for a public codebase that is used by a large community of neuroscience researchers.

Learn more bit.ly/MATLABToolboxProjects

How to apply Send an expression of interest identifying one or more specific toolboxes of interest and a recent CV to greg@incf.org
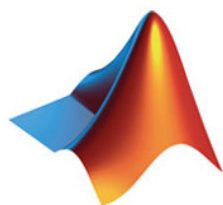
The INCF Neuroinformatics Assembly

What is the Assembly?

The INCF Neuroinformatics Assembly is the annual gathering of the INCF network, and serves as its major outreach outlet for the network. The Assembly provides a forum in which the neuroscience community can learn about the latest advancements in neuroinformatics, attend tutorials on the latest tools, methods, and neuroinformatics approaches, and interact with tool developers and infrastructure providers. It also serves as a forum where the neuroinformatics community comes together to acquire new skills, develop new technologies, and participate in the global network. INCF is committed to maintaining an open and inclusive environment where human diversity is welcomed and respected.

The INCF Assembly caters to two main groups:

- **Neuroscience and/or neuroinformatics researchers** interested in learning how to implement FAIR data management and sharing practices in their research, tools, and infrastructures.
- **Standards developers, infrastructure providers, and software developers** interested in learning about the latest advancements in the state of the art, increasing community adoption of their infrastructures and software, improving their craft, and those dedicated to working collaboratively with the community to develop solutions that support open, FAIR neuroscience.

Learn more about the Assembly: neuroinformatics.incf.org

incf | Neuroinformatics Assembly
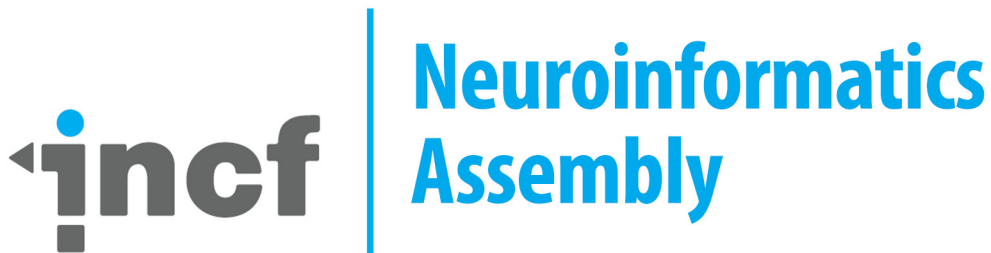
"I just wanted thank you and others in INCF on behalf of the ARTEM-IS team for inviting us to present our workshop at the INCF assembly and organising the meeting of all Working Groups. Not only that both were great opportunities for us and we have gotten new ideas from them, but we also felt very welcome and pleasant at the entire event, even though it was online."

Anđela Šoškić

Co-chair, ARTEM-IS Working Group

About INCF

The mission of INCF network is to promote the uptake of FAIR data management practices in neuroscience through the development of standards and best practices that support open, FAIR, and citable neuroscience. Specifically, the network aims to:

- provide coordination of global neuroscience infrastructure through the development and endorsement of standards and best practices in support of open and FAIR (Findable Accessable Interoperable Reusable) neuroscience
- support neuroscience as discipline to move towards FORCE (FAIR, Open, Research-object based, and Citable Ecosystem) through the development of community resources and the provision of training opportunities
- encourage neuroscience as discipline to move towards FORCE (FAIR, Open, Research-object based, and Citable Ecosystem)
- Promote the advancement and continued development of neuroinformatics as a scientific discipline
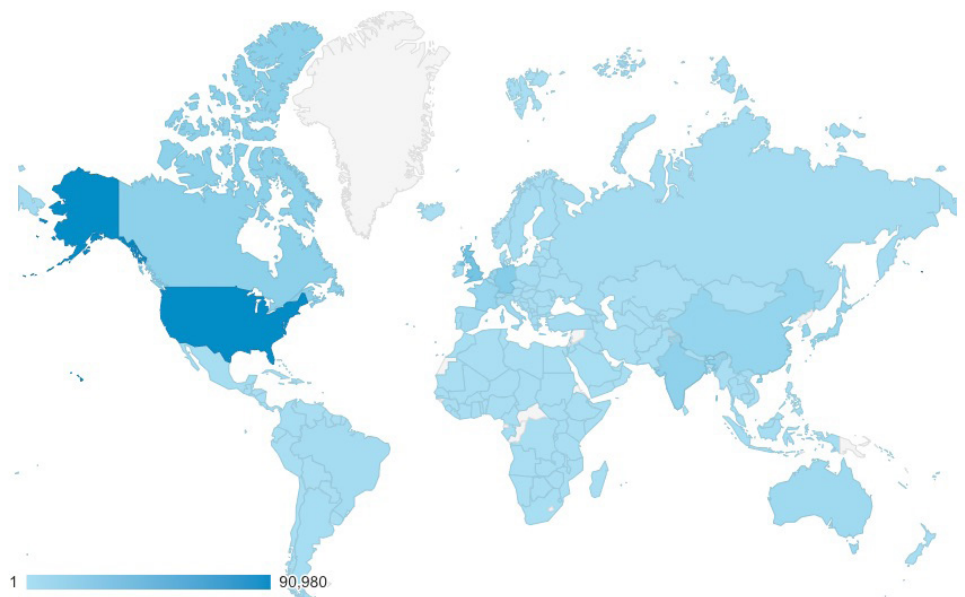
What is neuroinformatics?

Neuroinformatics is a research field devoted to the development of neuroscience data and knowledge bases together with computational models and analytical tools for sharing, integration, and analysis of experimental data and advancement of theories about the nervous system function.

In the INCF context, neuroinformatics refers to scientific information about primary experimental data, ontology, metadata, analytical tools, and computational models of the nervous system. The primary data includes experiments and experimental conditions concerning the genomic, molecular, structural, cellular, networks, systems and behavioural level, in all species and preparations in both the normal and disordered states.

The INCF network

The INCF network spans four continents, with an extended community comprising individual researchers, organizations, industry, and publishers. INCF currently has members all over the world, and our network spans over 200 countries. Countries, regions, organizations, groups, and individuals can participate in INCF activities on different levels.

Join INCF

INCF membership is open to individuals, institutions, organizations, companies, and countries, and provides access to decision making regarding global strategies for neuroinformatics and standards and best practices for neuroscience.

Membership in INCF is of interest for neuroinformaticians, neuroscience researchers who need to manage, share and analyze their data, infrastructure providers and tool developers, and funders who are trying to implement and encourage open and FAIR neuroscience.

Learn more about our member benefits at incf.org/join-incf

Who is INCF for?

Membership in INCF is useful for
- neuroinformaticians wanting to develop their skills
- neuroscience researchers needing training in how to manage, share, and analyze their data
- infrastructure providers and tool developers wanting to share experiences and develop their trade
- funders needing tools to implement and encourage open and FAIR practices in neuro-science projects

Why do we need standards in neuroscience?

Effective resource sharing means that data, processing methods, workflows and tools are made available, and also that they are made available in a way that ensures that published findings can be reproduced.

Data should be published with integration and reuse in mind, so they can be interpreted in new ways, and leveraged so that new knowledge can be extracted. For that to happen, neuroscience as a discipline needs to adopt the FAIR principles, ensuring that the results of science are Findable, Accessible, Interoperable and Reusable.

INCF enables its members to:

- participate in INCF Working Groups
- find collaborators through the INCF Industry Advisory Council
- interface with global large-scale brain initiatives

collaborate globally

- participate in discussions and decisions on global strategies for neuroinformatics
- nominate members to INCF committees
- organize the INCF Assembly

influence strategy

- attend the INCF Assembly at discounted fees
- have priority access to training in open science and data management
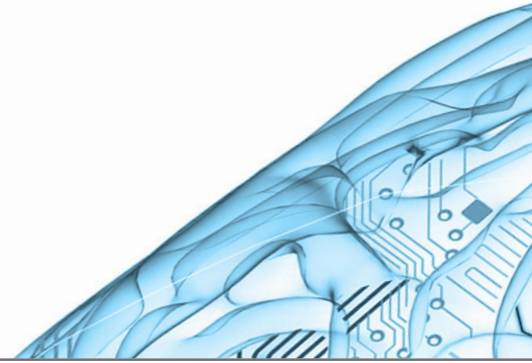- participate in industry-supported fellopship programs

build community capacity

Sign up: **incf.org/join**

Contact us: **info@incf.org**