

INCF NEWSLETTER

November/December 2008

INCF activities

Neuroinformatics Congress

The 1st INCF Congress of Neuroinformatics took place September 7 - 9, 2008, in Stockholm, Sweden. Nearly 300 scientists attended the meeting and the feedback has been tremendously positive. Videos of the keynote lectures and snapshots are available here:

<http://neuroinformatics2008.org/congress-movies>
<http://neuroinformatics2008.org/photos>

Neuroinformatics 2009 will be held in Pilsen, Czech Republic, September 6 - 8, 2009, and the chair of the Program Committee is Prof. David Willshaw. Confirmed keynote speakers include Kenji Doya, Arthur Toga, and Astrid Prinz.

<http://neuroinformatics2009.org>

INCF Neuroinformatics Portal

The INCF is releasing the Neuroinformatics Portal, a resource aiming to serve as an entry point to all relevant neuroinformatics resources. It will be demonstrated at the INCF booth during the SfN meeting, in Washington DC, November 16 - 19. All feedback is welcome to improve and help development of additional features.

<http://www.incf.org/>

The INCF Software Center: new functionalities

Tools for visualization, analyses, and modeling of the structure and function of the nervous system

New code hosting features:

- Users can now manage their code directly in the software center using Subversion. Project members can share and collaborate on code directly within the software center
- Code hosted by the software center can be browsed and versions can be compared using a web interface
- Code checkout and browsing permissions can be limited to team members

INCF Workshop Series

The INCF Secretariat coordinates topical workshops to facilitate networking, community interaction, and knowledge exchange. Workshop participants co-write a report that includes analysis and recommendations to the INCF. The recommendations represent the basis for actions to be initiated by the INCF, and the possible launch of an INCF program, delivering products, services, standards, and guidelines. Each workshop has about 15 invited participants selected on the basis of their expert skills in the particular area of the workshop. INCF National Nodes are allowed to send observers.

So far seven such topical workshops have been organized on:

- Large-Scale Modeling of the Nervous System
- Mouse and Rat Brain Digital Atlasing Systems
- Neuroimaging Database Integration
- Global Portal Services for Neuroscience
- Neuroanatomical Nomenclature and Taxonomy
- Sustainability for Neuroscience Databases
- Needs for Training in Neuroinformatics

The next topical workshop will be on "Time Series Data: Analysis and Management". The scientific organizer is Prof. Gareth Leng, University of Edinburgh, UK and it will take place December 4 -5, 2008, at the INCF Secretariat in Stockholm, Sweden.

Listen to your users:

- Project managers can enable an issue tracker
- Project managers can track specific file downloads on the site and export download statistics locally

Decide who you share your tool with:

- Download access can be restricted to registered users or users with specific permissions

<http://software.incf.org>

INCF National Nodes

Neuroinformatics in USA: the Neuroscience Information Framework

<http://nif.nih.gov>

An Initiative of the NIH Blueprint for Neuroscience Research

Established in 2004, the NIH Blueprint for Neuroscience Research brings the 16 NIH Institutes, Centers and Offices that support neuroscience research into a collaborative framework to coordinate their ongoing efforts and to plan new cross-cutting initiatives. Working together, representatives from the partner Institutes, Centers, and Offices identify pervasive challenges in neuroscience and any technological barriers to solving them.

Early in their deliberations Blueprint representatives recognized that a framework for identifying, locating, relating, accessing, integrating, and analyzing information from the neuroscience research enterprise is critical to enhancing cooperative activities in the neurosciences. A Broad Agency Announcement was issued, and, in 2005 the Blueprint began support for a new initiative known as the "Neuroscience Information Framework" (NIF).

Goals

The goal of this initiative is to develop an inventory of information and other resources within a framework that enables neuroscientists to identify resources relevant to their research needs. The framework will enable concept based queries (spanning multiple levels of biological organization and function) within and across the diverse types of information constituting the inventory. The framework also will provide a registry through which resources providers can disclose availability of



resources relevant to neuroscience research. The NIF framework is not intended to be a warehouse or repository itself, but a means for disclosing and locating resources elsewhere available via the web.

Resources

The NIF enables scientists and students to discover global neuroscience web resources that cut across traditional boundaries – from experimental, clinical and translational neuroscience databases, to atlases, and genetic/genomic resources. Resources include databases, software tools, experimental reagents and tools, knowledge bases and portals, and other entities identified by the neuroscience research community.

Unlike general search engines, NIF provides deeper access to a more focused set of resources that are relevant to neuroscience, search strategies tailored to neuroscience, and access to content that is traditionally "hidden" from web search engines. Although the Framework is still under development, a general list of inventory entries can be found at the Neurodatabase Gateway which is being supported by NIF to serve as a testbed for the project. While project development continues, a current list can also be obtained at the NIF catalog development site.

UC San Diego to Lead Neuroscience Information Framework

The University of California, San Diego School of Medicine has received a contract from the National Institutes of Health (NIH) to enhance and maintain the Neuroscience Information Framework (NIF).

"With this new contract, we are deploying an open framework for use by scientists at all levels, as well as the general public," said UC San Diego professor of neurosciences, Maryann Martone, Ph.D., co-director of the National Center for Microscopy and Imaging Research (NCMIR), part of the multi-disciplinary Center for Research in Biological Systems (CRBS), headquartered at

UC San Diego.

Under the contract – valued at up to \$10 million over the course of five years if all options are exercised – the CRBS will apply its pioneering work in neuroinformatics and web-based information integration environments. Martone, along with co-principal investigators Jeffrey Grethe, Ph.D., and Amarnath Gupta, Ph.D., will lead a national collaboration that includes researchers at Yale University, the California Institute of Technology, George Mason University, and Washington University. The collaboration focuses expertise from the domains of neuroscience, information technologies, and knowledge management to enhance and deploy the NIF.

Neuroinformatics around the world

INCF@SfN meeting 2008, booth #3226-3227 Washington DC, Nov.16 - 19

Sunday, November 16

morning (09:30 - 12:30)

- Standardization in Rodent Atlas Mapping: Waxholm Space (WHS)
Boline J, Hawrylycz M, Burger A, Hashikawa T, Johnson GA, Martone M, Ng L, Nissanov J, Puellas L, Ruffins S, Verbeek F, Zaslavsky I

- NeuroTools: analysis, visualization and management of real and simulated neuroscience data
Source Data Analysis Framework for Neural Data
Kremkow J, Brizzi T, Bruederle D, Davison A, Muller E, Perrinet L, Schmuker M, and Yger P

afternoon (13:30 - 16:30)

- MUSIC: the MULti-Simulation Coordinator
Djurfeldt M and Ekeberg Ö
- MUSIC in action: NeST talking to Moose
Hjorth J, Dudani N, Potjans T, Helias M, Djurfeldt M, and Ekeberg Ö

Monday, November 17

morning (09:30 - 12:30)

- SenseLab: New Directions in Neuroinformatics: Micro-circuits and Neurodegenerative Disease
Marenco LN, Morse TM, Mutalik PG, Migliore M, Cheung KH, Carnevale NT, Hines ML, Miller PL, and Shepherd GM
- The Inverse Current Source Density (iCSD) method: Precise estimation of CSD from multi-electrode recordings with one, two and three dimensional contact grids
Łęski Sz, Pettersen KH, Einevoll GT, Gigg Kublik E, Świejkowski DA, Tunstall B, Wróbel A, and Wójcik DK

afternoon (13:30 - 16:30)

- Finding hidden treasures: a related document search for SfN annual meeting abstracts
Usui S, Kamiji NL, Ueda N, and Taniguchi T
- NEST 2: A Parallel Simulator for Large Neuronal Networks
Diesmann M, Eppler JM, Gewaltig M-O, Helias M, Morrison A

INCF Neuroinformatics Portal
demo throughout the meeting

Tuesday, November 18

morning (09:30 - 12:30)

- INCF Japan Node (J-Node) and neuroinformatics platforms
Usui S, Kokubo T, Akazawa F, and Okumura Y
- Code Analysis, Repository and Modelling for E-Neuroscience (CARMEN)
Ingram C and Knowles A

afternoon (13:30 - 16:30)

- Matching spatial with ontological brain entities using the CoCoMac-Paxinos-3D tool
Bezgin R, Reid AT, Schubert D, and Kötter R
- Program for Ontologies on Neural Structure (PONS): Stop the chaos!
Martone M, Bowden D, De Schutter E, Heintz N, Ingram C, Kennedy MB, Saper C, Van Essen D, Williams R, Zabosky L, and Zilles K
- BrainInfo: An International Resource for Brain Anatomy hosted by the US Node
Grethe J, Bowden D, and Martone M

Wednesday, November 19

morning (09:30 - 12:30)

- CRCNS - Collaborative Research in Computational Neuroscience - Data sharing
Teeters J and Sommer F
- The INCF Software Center
Ritz R, Larsson A, Lillberg Y, Chatzopoulou E, Holm P, Naeslund M, Wang H, and Bjaalie JG

afternoon (13:30 - 16:30)

- Open forum discussion
Anyone is welcome to give a spontaneous demonstration

Did you know...

...that there will be two neuroinformatics related Social Events at Neuroscience 2008?

• Neuroinformatics Social Event

Sunday, November 16, 18:30 -20:30
Location: Renaissance Washington: Renaissance East

• Computational Neuroscience Social Event

Tuesday, November 18, 18:30 - 20:30
Location: Renaissance Washington Renaissance, West A

Neuroinformatics Profiles

Doug Bowden

Tracing History of the Field

When faced with a grant rejection, Doug Bowden started calling himself a neuroinformaticist. The University of Washington researcher had hints of neuroinformatics in his career since the mid-1980s. But it wasn't until 2004 when a National Institutes of Health review committee said his grant renewal needed an informaticist that his expertise crystallized.

"To rebut the critique, I gathered a long list of relevant projects completed, papers published and national review committees attended," Bowden said. He received the grant—which was for work that the NIH had supported since 1996—and he "came way with a new professional identity."

Bowden traces the history of neuroinformatics to 1963, when a Google Archives Timeline search indicates that a professor in China first mentioned neuroinformatics as a subject of research interest. Over the next 30 years, neuroinformatics sprouted in laboratories across the world, particularly in Japan, Germany, Austria, Switzerland, and Russia. Bowden's academic career has taken him on a geographically similar path, as he has had research positions across the globe, including Munich and Tokyo. His certificates in Russian language, which he earned from Indiana University in 1958 and 1961, enabled him to take on several short-term research jobs in Moscow, beginning in 1961 as a research fellow in neurophysiology.

But in the earlier days of the field, Bowden says, "neuroinformatics" meant neuromodeling. *"The extension of the term to include all applications of information technology to solve problems of neuroscience occurred in 1993, when the U.S. National Institutes of Health established the Human Brain Project," Bowden said.*

As a professor in the Department of Psychiatry and Behavioral Sciences at the University of Washington School of Medicine, Bowden heads the BrainInfo project (<http://braininfo.rprc.washington.edu/>), a free online atlas containing structural and functional information. *"Click on a gyrus and BrainInfo will list all the data that has been mapped into the atlas and that overlaps with that gyrus," Bowden told the INCF last year after he presented the atlas at the INCF's booth at the 2007 Society for Neuroscience meeting (<http://incf.org/news/articles/neuroinformatics-projects-attract-attention-at-the>).* Bowden, a medical doctor by training,

first thought up the atlas in the mid-1970s when lack of resources for anatomical data posed a hurdle in his electrophysiology studies of the primate brain. His idea evolved into the online resource BrainInfo, which was launched March 1, 2001. BrainInfo site will be demonstrated at the INCF's 2008 Society for Neuroscience booth.

Bowden's close participation in neuroinformatics over the decades gives him a special view of the field's historical development. *"The past 15 years have seen unbelievable progress in the application of information technology to high through-put data acquisition," Bowden said. "The ability to capture and analyze torrents of data in neurophysiology, noninvasive imaging such as MRI and PET, and gene expression mapping exceeds the greatest dreams of neuroscientists a few decades ago."*

But less progress has been made in communication, Bowden said. Finding and retrieving relevant information continue to be a problem for scientists. He lists these challenges in the application of information technology to communication:

- confused, redundant terminology of neuroscience;
- the indexing of information by names rather than concepts;
- the reliance of websites on navigation schemes based on library resource models rather than on the logic of the discipline;
- and the tendency to define goals in terms of ease of achievement rather than value to the seeker of information.

"Why is it that a search engine like Google can, within a few seconds, provide you a map showing all the Starbucks locations within 10 blocks of your home but cannot tell you the connections of the amygdala or even the best place to find that information on the Web?" Bowden said.

He is hopeful and excited by how neuroinformatics is expanding to include communication of neuroscientific information along with neural modeling and efficient data acquisition. Organizations like the INCF and the National Institutes of Health's Neuroscience Information Framework (<http://nif.nih.gov/>) recognize that efficient communication is important. *"Anyone in the world with access to the internet should be able to pose any questions about brain structure or function in any legitimate terminology, and, if the answer is on a server somewhere on the Web, they should find it within a couple of minutes with very few mouse clicks," Bowden said.*