INCF NEWSLETTER
Issue 1, 2009

INCF activities

The INCF Software Center

The INCF Software Center is getting richer with numerous additions over the last a few months. A number of these were demonstrated at the SfN 2008 annual meeting. We are currently running usability and evaluation tests in order to improve the Software Center according to your needs. Your comments are appreciated.

http://software.incf.org/

Latest INCF meetings

The 1st INCF Workshop on "Time Series Data: Analysis and Management" took place on December 4 – 5, 2008, in Stockholm, Sweden. Prof. Gareth Leng, from the University of Edinburgh, was the scientific organizer. The report with recommendations for future actions will be available soon.

The Task Force of the INCF Program on Digital Atlasing met in February 2009. A report on existing brain atlases and how atlas-based data sharing can be facilitated using a canonical atlas space is currently under preparation. This canonical atlas (Waxholm Space) was presented at the INCF booth at SfN Annual Meeting 2008.

INCF Welcomes New Director

Dr. Mark Ellisman, Professor of Neurosciences and Bioengineering at the University of California San Diego, has recently been appointed Director of the International Neuroinformatics Coordinating Facility.

Dr. Ellisman is recognized worldwide as an expert in the development and application of network and information technologies to advance the biological sciences. His research has furthered investigation into the basic molecular and cellular mechanisms of the nervous system, and has developed new methods in microscopy and computational biology.

He will retain his Professorship and Laboratory at UCSD during his tenure as Director of INCF.

INCF National Nodes

Polish/Norwegian INCF Nodes Workshop

Gaute Einevoll and Daniel Wójcik, Heads of the INCF Norwegian and Polish National Nodes respectively, co-organized a Workshop on "Local-Field Potential: modelling and interpretation of extracellular field potentials", on January 15 - 16, 2009, at Ski, Norway. A main theme of the workshop was the development and application of new mathematical and data analysis techniques to extract more information from multielectrode extracellular data.

http://arken.umb.no/~compneuro/lfpworkshop/LFP_workshop/Home.html

Neural Data Analysis

The INCF German National Node (G-node) launches a practical data analysis course on a yearly basis to promote state-of-the-art methods of neural data analysis. The inaugurating course, held on January 26 – 30, 2009 in Munich, focused on cellular electrophysiology. The students had the hands-on sessions on analysis of synaptic transmission using intracellular voltage and current clamp recordings, and spike train variability and coding using extracellular recordings.

The INCF Newsletter

Newsletter is now changing its habits: as from this Issue on, you will be reading us every 3 months. Our commitment to keep you updated remains. INCF Newsletter brings you the latest INCF news and the most relevant information from the community.

Your opinion matters: we will pay special attention to any comments you have with regards to the newsletter and welcome all ideas about exciting projects and people you would like to see featured in these pages.

Our address:

www.incf.org

INCF Secretariat, Karolinska Institutet, Nobels väg 15 A, SE-171 77 Stockholm, Sweden
Tel: +46 8 524 87093 Fax: +46 8 524 87 150
E-mail: info@incf.org

Neuroinformatics around the world

INCF increases its presence at the SfN meeting

The INCF participated for the third consecutive year in the annual meeting of the Society for Neuroscience, Neuroscience 2008. The booth was extended to span two sides of the aisle, and thus allowed more live demonstrations and interactions related to INCF activities.

One side of the aisle hosted 15 different projects, including Neurotools, the Inverse Current Source Density method, and the CoCoMac-Paxinos-3D tool. The other side was dedicated to presentation of the newly released INCF portal, discussions, and distribution of information materials on the latest INCF activities.

The location of the booth, in the institutional area and close to the Neuroscience Information Framework (NIF) booth, provided us with good visibility. Nearly 100 people visited us over the 4-day conference.

Featured Projects at the INCF Booth

• Multi-Simulation Coordinator (MUSIC):
Scheduled for release in early 2009, the INCF's MUSIC project is an API which allows large-scale neuronal network simulators to exchange data during runtime. At the INCF's SfN booth, Mikael Djurfeldt demonstrated how MUSIC can actually exchange information between two widely used simulators, NEST and MOOSE.

http://sc.incf.net/software/music/home

• Waxholm Space (WHS)
The INCF is creating an atlas framework of digital images of the rat brain, known as the Waxholm Space to serve as a hub connecting various reference atlases compiled by other groups. The WHS will normalize these references to make them more understandable to outside groups. This is the effort of an INCF task force investigating rodent brain atlases with the intention to provide a collection of atlases that reflect the multidimensional data and lead to the formulation of standards and guidelines for DigitalBrain Atlasing. Closely linked to this project is the Program on Ontologies of Neural Structures (PONS), also presented at the booth, aiming to clarify terminologies in neuroscience.

• Finding hidden treasures at SfN: A Tool from the INCF Japan Node
A keyword search unearths related abstracts, more than a classic search, it also proposes abstracts without the keyword but possibly of interest to the user.

http://ras.ni.brain.riken.jp/index.html

• Collaborative Research in Computational Neuroscience
An effort to promote data sharing. The site contains data sets and discussion fora. The data sets include physiological recordings from sensory and memory systems and eye movement data. Read more here:

http://www.crcns.org/

Some reappearing favorites at the INCF booth:

• CARMEN: A UK endeavor to create a virtual laboratory for neuroscientists studying the electrical signaling activity of neurons. The project will help a diverse, distributed community sharing data, software code and expertise.

http://www.carmen.org.uk/

• BrainInfo: An online, searchable atlas containing structural and functional information. Try it out here:

http://braininfo.rprc.washington.edu/

• Nest2: A simulation tool for large neuron networks

http://www.scholarpedia.org/article/NEST

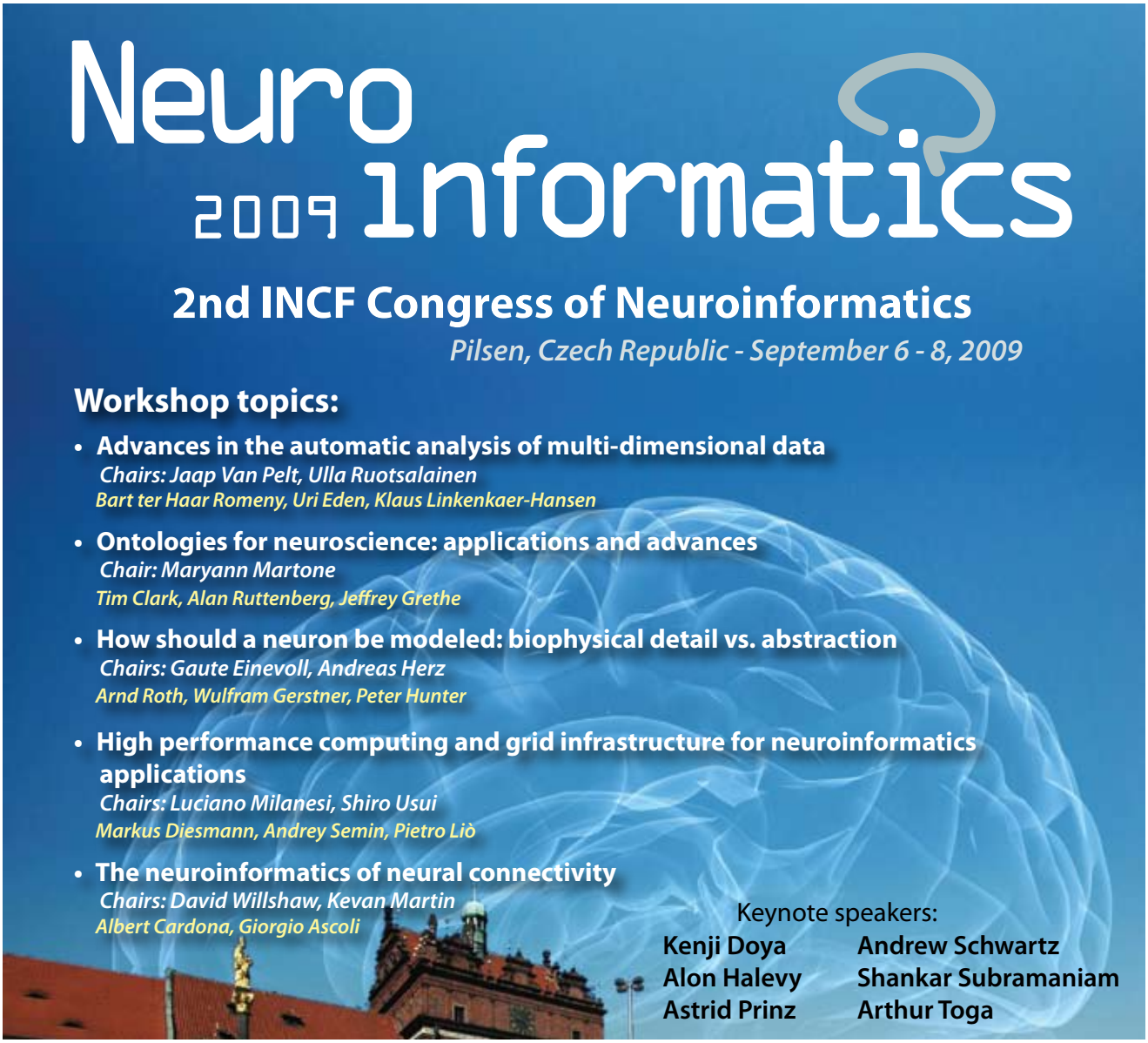
• SenseLab: A set of databases related to molecular, cellular and circuit level studies of the nervous system. Also includes a database in development for neurological diseases.

http://senselab.med.yale.edu/

Did you know...

... that the 2nd INCF Congress of Neuroinformatics is now accepting abstracts for poster and computer demo presentations? This year's congress features one major poster and demo session in the afternoon and evening of the second day with snacks and drinks. Submit your abstract before April 17th.

www.neuroinformatics2009.org



The INCF Neuroinformatics Portal

Released at the beginning of November 2008, the INCF Neuroinformatics Portal was demonstrated at the 2008 SfN annual meeting. Users were invited to discover this new resource and discuss their needs and expectations. Currently, the portal has three main sections:

- "About INCF", describing the organization and its activities;
- "Resources", providing links to the main gateways and portals of neuroinformatics databases, tools and services
- "Community", containing information about neuroinformatics researchers, events and training opportunities.

Exploring the "Community" Section

This section is planned to become a community forum for interaction. We provide a calendar of upcoming conferences, workshops, and courses related to neuroinformatics and welcome suggestions of other events that should be included. Under "Training", you can find a list of current opportunities in neuroinformatics training for undergraduates, graduates, postdoctoral researchers, and faculty, based on the report from the 1st INCF workshop on Training in Neuroinformatics. Join the Community now!

http://www.incf.org

Neuroinformatics Profiles

SfN's Neuroinformatics Committee: A conversation with outgoing chair, Robert Williams

The Society for Neuroscience's Neuroinformatics Committee (NIC) was created in 2004 so that SfN could collect neuroinformatics resources, vet them and then provide them to SfN members. The group continues to review and upload neuroinformatics resources to the portal Neuroscience Database Gateway [http://ndg.sfn.org/] that it launched in 2004. And recently, the committee had a change in leadership. At the 2008 SfN annual meeting in Washington, D.C., Robert Williams, Professor of Anatomy and Neurobiology at the University of Tennessee, Memphis, finished his term as chair of the NIC and was replaced by Maryann Martone, Professor-in-Residence at the University of California, San Diego's neuroscience department.

Sitting on a cushioned bench in an off-the-beaten track hallway of the Washington Convention Center, Williams described some of NIC's accomplishments over the four years of his chairmanship. Tracking and exploiting the changes in web services technologies that can be helpful to neuroscientists topped his list. "It's still early days; it's so dynamic. We must keep evaluating," Williams admitted, "It's very easy to get trapped in an obsolete technology." To avoid this, Williams suggested keeping tabs on "the big boys," like tracking how Google is keeping up with technology. Younger members of the neuroinformatics community can also help, as well as scientific communities—such as genomics—who are ahead of the curve.

The past five to ten years has seen a lot of tool and code sharing within the neuroinformatics field, and Williams predicts a greater use of neuroinformatics applications. "More and more neuroscientists will transition to using web tools," Williams said.

Data sharing could be the next big breakthrough. "We're lacking the mechanisms to share data effectively, such as methods to annotate," he added. "The diversity of data makes data sharing difficult too."

The INCF and other groups are working toward going beyond the controlled vocabulary that currently characterizes annotated datasets in neuroinformatics. The goal is to get a better semantic context of the data. Like, does "Purkinje" refer to a muscle, a cell, or the Czech physiologist Jan Purkinje? Williams used as an example. Beyond the infrastructure obstacles, Williams points to the sociological and cultural problems with getting scientists to share their data. "But data sharing is essential," he emphasized. And with cheap hard drives and availability of internet servers, data storage is no obstacle. "It's almost criminal to have data and to throw it away," he said. "We're losing 99% of our data. We take that for granted and that's a tragedy."

Robert Williams

It's like having a printing press and a lot of books, but no library. That's the situation we have now; we share the tips of the iceberg," Williams said of the neuroinformatics field.

Williams, whose large genetic experiments routinely use a thousand mice, indicated that making large datasets available could help with a "missing limb of science:" hypothesis testing. This part of the scientific process, commonly satisfied by reading the literature, could be made more productive by trying out hypotheses on existing datasets. Then, hypotheses could be generated more accurately by using actual data. Caveats exist, of course, in the quality of data, but ad hoc tests can still be valuable.

> ***" "It's almost criminal to have data and to throw it away. We're losing 99% of our data. We take that for granted and that's a tragedy", Robert Williams said.***

To illustrate his point, Williams flipped open his Mac laptop, opened an internet browser, navigated to Genenetwork.org, a database he manages with other University of Tennessee colleagues. Scrolling through the available datasets, looking for variables of interest, he selected mouse studies to test a hypothesis in a hypothetical experiment to illustrate ad hoc testing using data uploaded to the database.

"To do this, it's incredibly helpful to have an ocean of data to swim in," Williams commented of the ad hoc testing. "Right now, we have an ocean of articles to swim in."