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I am pleased to present the Annual Report for 2008. 

A new Strategy Overview for INCF was approved by the Governing Board in 2008. The activities of the INCF are now divided into products and services, forum and community development, and standards and compliance. 

At the level of products and services, many months of planning and implementation resulted in the release of the INCF Software Center in July and the INCF Neuroinformatics Portal in November. The launch of these new services allows many kinds of users to more easily tap into neuroinformatics resources developed by the community, as well as products and services provided by INCF. The Secretariat continued to deliver the web service for the Neuroscience Peer-Review Consortium. The hosting of the European mirror for the Allen Brain Atlas was established in early 2008, and a service providing access to an IBM Blue Gene supercomputer via the portal was launched in August. Furthermore, INCF introduced Travel Grants to provide support for travel related to neuroinformatics research collaboration and training. 

Three INCF Programs are now operative, and INCF has demonstrated its ability to translate workshop recommendations into action and deliverables. During 2007 and 2008, a total of 7 workshop reports were published and preparations were made to pursue a number of workshop recommendations. Some of the services outlined above are linked to INCF Programs, and several contracts for new services and products were issued during the year. 

Forum and community development was considerably strengthened during 2008. First and foremost, the 1st INCF Congress was held in Stockholm, Sweden, in September, and preparations began for the second Congress in 2009. 

Two further key networking actions took place. One was a meeting in Washington D.C. on global neuroinformatics and the INCF mission, which was organized in collaboration with the National Science Foundation and drew more than 100 participants from funding agencies and governments. The other was the first INCF National Nodes Workshop in Varenna, Italy, that brought together representatives from all member countries. 

Progress was made in the area of standards and compliance. Oversight committees and task forces of international experts have been established for each INCF Program. The digital brain atlasing effort has focused on infrastructure and tools for registration of imaging data to standardized space. Of importance to the computational modeling field, standardization efforts at multiple levels of description have been facilitated, and a software tool for communication among parallel applications for large-scale simulation of neural networks was released in early 2009. In the area of ontologies, INCF is contributing to the development of new tools to deal with translation and clarification of terminologies in collaboration with leading initiatives world-wide. 

In being able to report on the achievements for 2008, I am grateful to have presided over an excellent team at the INCF Secretariat. Further, the Secretariat has benefited from superb working relationships with the Governing Board and National Nodes. The mechanisms needed to further coordinate, promote, and develop neuroinformatics are now in place. Significant new achievements under the INCF programs can be expected in 2009.

Jan G. Bjaalie
Stockholm and Oslo, May 2009
Activities of the INCF Secretariat during 2008

- INCF Neuroinformatics Portal
- INCF Software Center
- Neuroscience Peer-Review Consortium
- Newsletter
- INCF Travel Grants
- Large-Scale Modeling Standard: Multi-Simulation Coordinator (MUSIC)
- Brain Atlasing Standard: Waxholm Space
- Reports from Oversight Committees and Task Forces of INCF Programs

**Products and Services**
- INCF – IBM Blue Gene
- Allen Brain Atlas Mirror

**Forum and Community Development**
- INCF National Nodes Workshop
- INCF Congress
- INCF Exhibit at FENS Forum
- National Science Foundation – INCF meeting
- INCF Exhibit at SfN conference
- INCF Workshop on Time-Series Data: Analysis and Management

**Standards and Compliance**
- INCF Workshop on Training in Neuroinformatics
The INCF Secretariat: Overview of Operations

In 2008, the Secretariat of the INCF employed a staff of 13, holding 11,5 positions. From its premises at the Solna campus of Karolinska Institutet in Stockholm, the Secretariat continued to work towards coordinated global development of the field of neuroinformatics.

In May, Karin Gabrielson replaced Ulf Larsson as controller. In July, system developer Per-Erik Strandberg, member of the portal development team, left the INCF Secretariat after having contributed to the development and release of the new INCF Software Center. Janis Breeze was recruited as Program Officer. It was announced that Jan Bjaalie would leave his position as Executive Director to take up a new position as Head of the Institute of Basic Medical Sciences at the University of Oslo from 2009. The INCF Governing Board approved the recruitment of Mark Ellisman as new Director of the INCF from January 1, 2009.

During 2008, the primary responsibilities of the INCF Secretariat comprised:

- Planning, execution, and monitoring of INCF programs
- Development and management of collaborations and business agreements, including partnerships and contracts under INCF programs and other activity areas
- Development and maintenance of the INCF Neuroinformatics Portal, the INCF Software Center, and the Neuroscience Peer-Review Consortium
- Fostering of national node networking, including organization of Nodes workshop
- Management and support for organization of annual INCF Congress
- Management of agreements with member countries and funding agencies, including formal reporting
Expanding Activities of INCF National Nodes

INCF was conceived to operate as a central (Secretariat) as well as distributed (National Nodes) facility to coordinate and harmonize global neuroinformatics efforts. Implementation of INCF activities is carried out via the Secretariat and National Nodes, and National Nodes transmit international activities locally.

Expert scientists from, or linked to, the nodes, continued to contribute to the topical workshops during 2008, as invited participants or observers. The nodes continued to influence the directions taken by the INCF as a global network, through the Governing Board of the INCF as well as informal channels.

Better coordination among individual National Nodes as well as integration with INCF Secretariat activities were reached via several measures. Descriptions and specifications of structure of more mature nodes have been gathered to help others set up and coordinate their operations. INCF Travel Grants were established to facilitate communication among the nodes and general networking in the community, focusing on relevance for INCF priorities. In collaboration with the National Node of Italy, the Secretariat organized an INCF National Nodes workshop in Varenna, Italy, in October. This workshop gathered 40 representatives from all nodes. Issues related to local operations and improved integration of INCF actions were discussed.

National Node web pages

<table>
<thead>
<tr>
<th>Country</th>
<th>Web Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td><a href="http://www.neuroinformatics.be/">http://www.neuroinformatics.be/</a></td>
</tr>
<tr>
<td>Czech Republic</td>
<td><a href="http://www.lss.fd.cvut.cz">http://www.lss.fd.cvut.cz</a></td>
</tr>
<tr>
<td>Finland</td>
<td><a href="http://www.cs.tut.fi/sgn/neuroinfo/">http://www.cs.tut.fi/sgn/neuroinfo/</a></td>
</tr>
<tr>
<td>Germany</td>
<td><a href="http://www.neuroinf.de">http://www.neuroinf.de</a></td>
</tr>
<tr>
<td>Italy</td>
<td><a href="http://www.neuroinf.it">http://www.neuroinf.it</a></td>
</tr>
<tr>
<td>Japan</td>
<td><a href="http://www.neuroinf.jp">http://www.neuroinf.jp</a></td>
</tr>
<tr>
<td>The Netherlands</td>
<td><a href="http://www.neuroinformatics.nl">http://www.neuroinformatics.nl</a></td>
</tr>
<tr>
<td>Norway</td>
<td><a href="http://www.cmbn.no/incf">http://www.cmbn.no/incf</a></td>
</tr>
<tr>
<td>Poland</td>
<td><a href="http://www.neuroinf.pl">http://www.neuroinf.pl</a></td>
</tr>
<tr>
<td>United Kingdom</td>
<td><a href="http://www.neuroinformatics.org.uk">http://www.neuroinformatics.org.uk</a></td>
</tr>
<tr>
<td>United States</td>
<td><a href="http://apu.sfn.org/index.cfm?pagename=committee_neuroinformatics">http://apu.sfn.org/index.cfm?pagename=committee_neuroinformatics</a></td>
</tr>
</tbody>
</table>

National node web pages are in preparation for more countries.
More journals Join the Neuroscience Peer-Review Consortium

The INCF Secretariat has continued to provide administrative support and host and maintain the web site for the Neuroscience Peer-Review Consortium – NPRC. The NPRC is an alliance of neuroscience journals that have agreed to accept manuscript reviews from other members of the consortium. Its goals are to support efficient and thorough peer review of original research, speed up the publication of research reports, and reduce the burden on peer-reviewers.

The impetus for the consortium came from one of the working groups of the PubMed Plus Conference, organized by the Society for Neuroscience and co-sponsored by the INCF, in June 2007. The INCF was chosen as a neutral venue for the consortium. The NPRC was introduced in November 2007, with eight journals as founding members. Since then, the consortium has rapidly attracted more journals. In early 2008, Nature Neuroscience joined, and at the end of 2008, around 30 journals were members.

Editorials on NPRC published in 2008 include:

“
We hope that the option to share reviews between journals will reduce the burden on reviewers and bring new results to readers more quickly.”

John Maunsell, Editor-in-Chief; The Journal of Neuroscience

NPRC Participating Journals

Behavioral and Brain Functions
Behavioral Neuroscience
Biological Psychiatry
Brain Research
Brain Structure and Function
CNS Spectrums
Developmental Neuroscience
European Journal of Neuroscience
European Psychiatry
Experimental Neurology
Hippocampus
Human Brain Mapping
Journal of Alzheimer’s Disease
Journal of Comparative Neurology
Journal of Computational Neuroscience
Journal of Integrative Neuroscience
Journal of Neurophysiology
Journal of Neuroscience
Journal of the Association for Research in Otalaryngology
Learning & Memory
Molecular and Cellular Neuroscience
Nature Neuroscience
Neural Development
Neural Plasticity
Neurobiology of Disease
Neurobiology of Learning and Memory
Neuroendocrinology
NeuroImage
Neuroinformatics
Neuropsychopharmacology
Neuroscience
Neuroscience Letters
Psychophysiology
Restorative Neurology and Neuroscience
### All software tools

<table>
<thead>
<tr>
<th>Name</th>
<th>Rating</th>
<th>Last Updated</th>
<th>Stability</th>
<th>Downloads</th>
<th>Screenshots</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlas3D</td>
<td></td>
<td>07-Jul-2000</td>
<td>Intermediate</td>
<td>2 download</td>
<td></td>
<td>Experimental data can be imported in Atlas3D and warped to atlas space, using linear registration, with the possibility to scale, rotate, and position the imported data. The software assigns positions...</td>
</tr>
<tr>
<td>ImageJ</td>
<td></td>
<td>01-Jun-2000</td>
<td>Stable</td>
<td>51 download</td>
<td></td>
<td>ImageJ is a Java-based image processing program developed at the National Institutes of Health.</td>
</tr>
<tr>
<td>MyFirstNeuron</td>
<td></td>
<td>16-May-2000</td>
<td>Stable</td>
<td>32 download</td>
<td></td>
<td>MyFirstNEURON is a NEURON demo written by Arthur Houweling after the book Electrophysiology of the Neuron by John Skaggs and David McCormick (New York 1994, Oxford University Press). MyFirstNEURON allows...</td>
</tr>
<tr>
<td>Neuron</td>
<td></td>
<td>28-May-2000</td>
<td>None</td>
<td>12 download</td>
<td></td>
<td>NEURON is a simulation environment for modeling individual neurons and networks of neurons. It provides tools for conveniently building, simulating, and analyzing models of neuronal behavior.</td>
</tr>
<tr>
<td>PyNN</td>
<td></td>
<td>07-Jul-2000</td>
<td>Intermediate</td>
<td>17 download</td>
<td></td>
<td>You can write the code for a model once, using the PyNN API, and then run it without modification on any simulator that PyNN supports.</td>
</tr>
<tr>
<td>oChip</td>
<td></td>
<td>07-Jul-2000</td>
<td>Stable</td>
<td>5 download</td>
<td></td>
<td>oChip (Oligo Chip Analyzer) (<a href="http://www.ochip.org">www.ochip.org</a>) is a Windows software package for probe-level (e.g., Affymetrix perfect match) and high-level analysis of gene expression microarrays and SNP microarrays. Lin et al., 2001.</td>
</tr>
<tr>
<td>neuroConstruct</td>
<td></td>
<td>07-Jul-2000</td>
<td>Stable</td>
<td>15 download</td>
<td></td>
<td>neuroConstruct has been designed to simplify creation, visualization, simulation and analysis of complex networks of biologically realistic neurons, i.e., models incorporating dendritic morphologies and realistic cell membrane conductances. It can...</td>
</tr>
</tbody>
</table>

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InCF, an international collaboration, provides a directory of computational neuroscience tools, including software for modeling, visualization, and simulation of neural and computational systems. For more information, visit [InCF](http://www.incf.org).
New INCF Portal and INCF Software Center

Following the recommendations of the INCF Workshop on Global Portal Services for Neuroscience, the Secretariat has developed the INCF Neuroinformatics Portal. This new portal-of-portal, linking to and integrating with existing neuroinformatics portal services, was released in November at the Annual Meeting of the Society for Neuroscience.

The portal contains three main sections:

- the “About INCF” section, describing the organization and its activities, including programs and projects
- the “Resource” section, pointing to the main gateways and portals to neuroinformatics databases, tools, and services, and aiming at presenting new opportunities for interoperability among services as well as reference material such as standards, guidelines, and ontologies.
- the “Community” section, providing high level information about neuroinformatics research groups and projects, people involved, funding opportunities, and relevant events.

The INCF Software Center was released a few months before the portal, at the conference of the Federation of European Neuroscience Societies. As a standalone application closely linked to the INCF Neuroinformatics Portal, it allows users from the wider neuroscience community to efficiently find, evaluate, and make use of shared software tools. The INCF Software Center will not only make relevant software discoverable for the neuroscience community but also provide services for developers and users. It offers advanced classification and search tools as well as rating and evaluation facilities. The vision is to become the leading communication enabler for software users and developers in the field of neuroinformatics.

An increasing number of software tools were registered during 2008, leading to a listing of more than 50 tools by the end of the year. During the fall of 2008, preparations were made for interoperability of the INCF Software Center with NITRC - the Neuroimaging Informatics Tools and Resources Clearinghouse (www.nitrc.org), a service established through the NIH Blueprint for Neuroscience Research and aimed at the functional magnetic resonance imaging (fMRI) and associated structural analysis community.
Neuroinformatics combines neuroscience and informatics research to develop and apply the advanced tools and approaches that are essential for major advances in understanding the structure and function of the brain.

**Sunday, November 16**

**morning (09:30 - 12:30)**
- Standardization in Rodent Atlas Mapping: Waxholm Space (WHS)
- NeuroTools: analysis, visualization and management of real and simulated neuroscience dataSource
  - Kremkow J, Britz T, Bruderle D, Davison A, Müller E, Perrett I, Schmucker M, and Yger P

**afternoon (13:30 - 16:30)**
- MUSIC: the Multi-Simulation Coordinator
  - Djurfeldt M and Ekeberg O
- MUSIC in action: NeST talking to Moose
  - Hjorth J, Duddani N, Potjans T, Helias M, Djurfeldt M, and Ekeberg O

**Monday, November 17**

**morning (09:30 - 12:30)**
- SenseLab: New Directions in Neuroinformatics: Microcircuits and Neurodegenerative Disease
  - Marenco LN, Morse TM, Mutalik PG, Migliore M, Cheung KH, Camarillo 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 J, Kubik E, Świętkowski 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, Kamiya 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, and Plesser HE

**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
  - Berger R, Reid A, Schubert D, and Kötter R
- Program for Ontologies on Neural Structure (PONS): Stop the chaos!
- 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)**
- CRNCS - Collaborative Research in Computational Neuroscience - Data sharing
  - Teeters J and Sommer F
- The INCF Software Center

**afternoon (13:30 - 16:30)**
- Open forum discussion
  - Anyone is welcome to give a spontaneous demonstration

INCF Neuroinformatics Portal demo throughout the meeting
Live Demonstrations at International Conferences

INCF participated as an exhibitor for the third time at the annual conference of the Society for Neuroscience (Neuroscience 2008), held in Washington DC, October 16-19, and for the first time at the biannual conference of the Federation of European Neuroscience Societies (FENS Forum 2008), held in Geneva, July 13-16. Key INCF events at the exhibits included the releases of the INCF Software Center in Geneva, and the new INCF Neuroinformatics Portal in Washington (page 9). Usability testing of the new applications and interviews of visitors to the booths were performed by Ylva Lillberg, our Usability and Requirements Analyst.

As a follow-up to previous INCF attendance at large conferences, the exhibits were centered on a series of live demonstrations of neuroinformatics databases, tools, and simulation environments. Taken together, the programs for live demonstrations at the two exhibits included more than 22 presentations from 11 countries and more than 30 laboratories. The programs were prepared by our Scientific Officer Raphael Ritz in collaboration with several INCF National Nodes.

A special interest social event was organized at the Geneva meeting. The social featured a talk show on the topic “Why should neuroscientists want to take advantage of neuroinformatics?” with Alain Berthoz, Rodney Douglas (chair), Michael Hines, and Colin Ingram as panelists, and demonstrations of the Amphibot and Salamandra robots by Alessandro Crespi and Auke Jan Ijspeert.

Countries that contributed with live demonstrations at INCF booths, Geneva and Washington DC, 2008:

- France
- Germany
- Japan
- The Netherlands
- Norway
- Poland
- Spain
- Sweden
- Switzerland
- United Kingdom
- United States
Welcome to Neuroinformatics 2008
1st INCF Congress of Neuroinformatics: Databasing and Modeling the Brain
Stockholm, September 7 - 9, 2008

Welcome to the official site of Neuroinformatics 2008, the 1st INCF Congress of Neuroinformatics. It took place September 7 - 9, 2008, and attracted 267 participants!

The congress organizers wish to express their deepest gratitude to all speakers and participants for making this congress the great success that it was! We hope to see you next year at Neuroinformatics 2009.

Keynote Speakers

Mark Ellisman
Title: Brain Research in the Digital Age
Affiliation: University of California San Diego, USA
(Click to read more)

David Van Essen
Title: A neuroinformatics perspective on cerebral cortical structure and function
Affiliation: Washington University, St. Louis, USA
(Click to read more)

Mitsuo Kawato
Title: Towards Manipulative Neuroscience based on Brain-Network-Interface
Affiliation: ATR Computational Neuroscience Labs, Kyoto, Japan
(Click to read more)

Mary Kennedy
Title: Synaptic Nanomachines
Affiliation: California Institute of Technology, Pasadena, USA
(Click to read more)

Henry Markram
Title: The Blue Brain Project
Affiliation: Brain Mind Institute, EPFL, Lausanne, Switzerland
(Click to read more)

Idan Segev
Title: Towards an Objective Analysis of the Firing Variability of Cortical Neurons
Affiliation: Hebrew University, Jerusalem, Israel
(Click to read more)

Special Session

Perspectives in funding research in neuroinformatics
- Kathie Cisek, National Science Foundation, USA
- Wolfgang Boch, European Commission, Future and Emerging Technologies

Congress Workshops

Future hardware challenges to scientific computing
Chair: Erik De Schutter
- Gabriel Wittum, Ruprecht-Karls-University of Heidelberg, Germany
- Marc-Oliver Gewaltig, Honda Research Institute Europe, Offenbach, Germany
- John Shallit, Lawrence Berkeley National Laboratory, USA

Neurogenomics meets bioinformatics meets neuroinformatics
Chair: Robert Williams
- Ed Lein, Allen Institute for Brain Science, Seattle, USA
- Seth Grant, Sanger (Cambridge University), UK
- Kristen Harris, University of Texas at Austin, USA

Extraction of structural and functional information from brain images
Chair: Ulla Ructalainen
- Katrin Amunts, Research Center Jülich, Germany
- Alan Evans, McGill University Montreal, Canada
- Thomas Mroz-Fogle, University College London, UK

Challenges and benefits of multichannel electrophysiology
Chair: Andrzej Wobet
- Gyorgy Buzsaki, Rutgers University, Newark, USA
- Miguel Nicolelis, Duke University, Durham, USA
- Xiaoqin Wang, Johns Hopkins, Baltimore, USA
**INCF Congress, Networking, and External Information**

As an integrated action for promoting interaction and facilitating communication in the community, INCF has launched its first congress. With an interdisciplinary emphasis and broad international outreach, the 1st INCF Congress took place in Stockholm, September 7 – 9. The meeting brought together nearly 300 scientists under the common denominator of neuroinformatics. The format was a single-track meeting with keynote lectures, poster sessions, and interactive demonstrations. This provided opportunities for discussions and extensive interactions among participants. Given the very positive response from the attendees, it was decided to make the congress an annual event, with the 2nd INCF Congress scheduled for Pilsen, the Czech Republic.

The second major general neuroinformatics event organized by the INCF in 2008 was the Nodes Workshop (page 6). The Secretariat remained in close contact with the nodes during the year to establish important links related to INCF actions, including projects under the various programs.

As a major vehicle of communication within the INCF global network and across the neuroscience and neuroinformatics community in general, the INCF Newsletter series was initiated in July. Three issues (online and printed) were published during 2008 covering the latest developments and activities of INCF, including contributions and updates from INCF National Nodes and related neuroinformatics initiatives.

The INCF organized exhibits at two large international meetings, focusing on release of its new web applications and an extensive series of live neuroinformatics demonstrations (page 11).

A Special Issue on Neuroinformatics in the journal Neural Networks, edited by members of the INCF Governing Board and the Executive Director, was published.

Several members of the INCF Governing Board and the Executive Director contributed to the further development of the electronic open access journal Frontiers in Neuroinformatics (www.frontiersin.org/neuroinformatics). The journal was launched in 2007 and was in late 2008 ranked as the second most successful of more than 10 specialty journals in the Frontiers series.
INCF Topical Workshops Continue

The stepwise process for the planning of actions in target areas continued in 2008. At the level of topical workshops, representing the basis for actions, the INCF coordinated the following workshops during the year:

1st INCF Workshop on Training in Neuroinformatics. Edinburgh, July 23–25, 2008 (organized by the UK Node)


Each workshop invited about 15 world experts with skills in the particular area of the workshop. INCF National Nodes are invited to send observers. The workshops deal with selected problems, including technical issues of primary importance for neuroinformatics, or research topics coupled to databasing of neuroscience data, tools developments, or modeling of nervous system functions.

Five workshop reports with extensive analyses and multiple recommendations for future actions were published in 2008: four reports from workshops organized in the second half of 2007, and one from the 2008 Workshop on Training.

| Countries participating with invited experts or observers at INCF workshops during 2008: |
|-------------------|-------------------|
| Australia         | Norway            |
| Finland           | Poland            |
| Germany           | Sweden            |
| Italy             | United Kingdom    |
| Japan             | United States     |
| The Netherlands    |                   |
INCF Programs: Instruments for Action

Following a process of evaluation and prioritization of recommendations presented by the INCF workshops, the INCF Governing Board approves the launching of programs. INCF programs are multidisciplinary and targeted to user groups and stakeholders. They are aimed at solving identified problems through various activities, including products and services, establishment of standards, and forum and community development.

Two programs (Program on Large-Scale Modeling and Program on Digital Atlasing) were launched in late 2007. A third, Program for Ontologies of Neural Structures, were launched in 2008.

Mechanisms for linking actions under the programs to the scientific community were established in 2008. The mechanisms actively involve opinion leaders and technical experts in working groups at three levels: Oversight Committees, Task Forces, and Reference Groups.

- **Oversight Committees** exist for each program and consist of 10-20 leading scientists from around the world. They encompass a range of expertise related to the Program area, and have broad geographic representation. The Oversight Committee determines the overall scope of the Program, and establishes Task Force(s) to complete specific activities.

- **Task Forces** are established to work on specific projects within a Program. They are generally composed of 10-15 technical experts from around the world.

- **Reference Groups** include representatives from the INCF network as well as the scientific community at large. Members contribute ideas and feedback about the preliminary products generated by the Task Forces. They exist to help guide the projects to best meet the needs of and ensure adoption by the scientific community.

During 2008, the Oversight Committees met as follows:

**Program on Large-Scale Modeling**
- Inaugural meeting: August 10, 2008
  Freiburg, Germany
- First full meeting: December 11-12, 2008
  London, United Kingdom

**Program on Digital Brain Atlasing**
- Inaugural meeting: March 5, 2008
  Los Angeles, California, USA

**Program on Ontologies of Neural Structures**
- Inaugural Meeting: September 10-11, 2008
  Stockholm, Sweden
Program on Large-Scale Modeling

Understanding the brain requires the integration of huge amounts of heterogeneous and complex data collected at multiple levels of investigation. Computational modeling techniques help extract more knowledge from the experimental data, and large-scale modeling bridges the multiple levels of organization in the description and understanding of the nervous system. The key aim of this INCF program is to facilitate the development of new products, services, and standards in this increasingly important field in neuroscience research.

Multi-Simulation Coordinator – MUSIC

INCF has commissioned a simulator interoperability tool. The tool is a software interface that allows simulators to exchange data during runtime. Different simulators, suitable for modeling at different levels of investigation and complexities, can thus be efficiently combined for more powerful analysis. MUSIC was developed and extensively tested in 2008 under a contract with the Royal Institute of Technology in Stockholm and in close collaboration with several INCF National Nodes. MUSIC is scheduled for release in 2009.

Supercomputer Access

INCF owns a share of a BlueGene/L (BG/L) supercomputer. Allocations are available through the INCF Neuroinformatics Portal. A forum for usage and information about access to other computing resources is being developed.

Standards and Guidelines

The inaugural meeting of the INCF Oversight Committee for the Program took place in Freiburg, Germany, in August, followed by the first regular meeting in London, UK, in December. A priority is to foster the development of community-supported description languages for neuroscience models. Spiking networks of simple model neurons, a fast growing area, has been chosen as initial focus area. A community-based development effort is creating a machine-readable declarative language standard that describes integrate-and-fire neural network models.

Oversight Committee Chair:

Erik De Schutter, Okinawa Institute of Science and Technology, Okinawa, Japan

MUSIC is a standard interface for run-time exchange of data between parallel applications in a cluster environment. It is designed for interconnecting large scale neuronal network simulators with each other or with other tools. Data may consist of events, such as neuronal spikes, or graded continuous values, like membrane voltages. The usage example (top panel) shows three applications executing in parallel while exchanging data via MUSIC. The software interface promotes inter-operability by allowing models written for different simulators to run together in a larger system. Since data is spread out over a number of processors, it is non-trivial to coordinate the transfer of data so that it reaches the right destination at the right time. MUSIC relieves the applications from handling this complexity (bottom panel).
Program on Digital Brain Atlasing

Digital brain atlases are essential tools in neuroscience research. They function as references and analytical tools, and provide stable integration frameworks as a basis for investigations of normal and abnormal brain structure and function. Web-accessible brain atlases and spatial indices promise to evolve into powerful tools for dynamic, multidimensional modes of scientific interaction. The key aim of this INCF program is to coordinate and improve the impact of atlasing projects, with a focus on rodent brain.

INCF Allen Brain Atlas Mirror Site

The INCF Secretariat has operated the European mirror of the Allen Brain Atlas (ABA) since March 2008 under a partnership agreement with the Allen Institute for Brain Science. The ABA is an open-access, genome-wide image database that maps gene expression throughout the adult mouse brain, and is the leading rodent brain digital atlas. The atlas and associated data visualization and mining tools are freely available through an integrated Web service to encourage widespread use and collaboration. The mirror server, located in Stockholm, Sweden, is synchronized with the main server in Seattle, Washington. Users are automatically directed by a load balancer to the main or mirror server depending on the current load, availability, and network performance.

Standards and Guidelines

The inaugural meeting of the INCF Oversight Committee for the program took place in Los Angeles, California, in March. As a step towards fostering more efficient uses of atlases through data sharing and database interoperability, the Committee decided to survey existing resources for registration of data to atlas space (image data collected at various levels of granularity, and other data types), with a focus on rodent spatial data and canonical reference systems or description languages. Based on the survey and subsequent analyses, a set of standards and guidelines for the handling of experimental data in the context of atlasing would be developed, followed by specific pilot projects for proof of principle and/or feasibility studies, and future funding recommendations. A Task Force was given the responsibility of preparing the survey document including (a) the purpose and value of digital atlasing in the rodent and its relationship to other model organisms and the human brain, (b) the state-of-the-art of digital atlasing in the rodent, (c) vision and description of the ideal infrastructure, systems, and methods, (d) practical options for achieving the goals, and (e) the role of the community and the INCF in achieving a working infrastructure. The Task Force began work in April 2008, and met in Waxholm, Sweden, in September. A preliminary report was finalized in November. Preparations were made for INCF pilot projects and feasibility studies to be carried out in 2009. A new standardization in atlas mapping is being developed, known as Waxholm Space.

Oversight Committee Chair:
Robert Williams, University of Tennessee, Memphis, Tennessee, USA

Task Force Lead:
Michael Hawrylycz, Allen Institute for Brain Science, Seattle, Washington, USA

The canonical atlas space, or Waxholm Space (WHS), acts as the hub of a centralized infrastructure connecting several key reference spaces. Reference atlases mapped into the space are “normalized” and may share their associated data and services in a manner that is understandable to external sources/users.
**Program on Ontologies of Neural Structures**

Controlled vocabularies are required as a basis for useful and practical sharing and re-use of data. Ontologies in the context of neuroscience are formal representations of the set of terms used within a domain area of research and the relationships between the terms. Neuroinformatics delivers the information science approaches needed to build and manage ontologies for neuroscience. Closely linked to the Program on Digital Brain Atlassing, the Program on Ontologies of Neural Structures will establish a platform for translation and clarification of terms describing neural structures at various levels of granularity. It endeavors to reach all areas of neuroscience, since ontologies of neural structures represent a foundation for communication across disciplines and levels of investigation.

**BrainInfo**

The BrainInfo data system (www.braininfo.org) is a neuroanatomical resource developed over more than two decades at the University of Washington, Seattle. With an index to brain structures and narrative information about them, as well as a brain atlas and information overlays, the system represents a valuable step towards future platforms for ontologies of neural structures. Via the U.S. Node, INCF has brokered the sustained availability of BrainInfo to the community as a vital and dynamic resource.

**Link to Neuroscience Information Framework**

The Neuroscience Information Framework (NIF) is an NIH funded project aimed at providing multiple new services to the biomedical research community. Operations of this INCF Program will be tailored to interact with NIF Vocabularies, a critical component of the NIF project focused on ontologies for various domain areas of neuroscience.

**Focus areas**

The inaugural meeting of the INCF Oversight Committee took place in Stockholm in September. Three initial foci were prioritized: Structural Lexicon, Neuronal Registry, and Technical Infrastructure. During the fall, task forces for each of the areas were planned, and preparations were made for new activities and full operation of the program in 2009.

**Chair, Oversight Committee:**

Maryann Martone, University of California at San Diego, California, USA

**Lead, Structural Lexicon Task Force:**

David Van Essen, Washington University, St. Louis, Missouri, USA

**Lead, Cell Convention and Naming Task Force:**

Giorgio Ascoli, George Mason University, Fairfax, Virginia, USA

**Lead, Representation and Deployment Task Force:**

Alan Ruttenberg, Science Commons, Cambridge, Massachusetts, USA
Plans for 2009

- Further develop and re-organize the INCF Neuroinformatics Portal according to the needs of portal users and INCF programs and activities.
- Maintain and develop services including Blue Gene supercomputer access, Travel Grant mechanism, and Newsletters.
- Maintain the INCF Software Center, stimulate the registration of more software tools, and build interoperability with the NIH-funded Neuroimaging Informatics Tools and Resources Clearinghouse (NITRC).
- Maintain the Neuroscience Peer-Review Consortium website and associated services.
- Further develop the three INCF Programs. Organize meetings of oversight committees, task forces, and references panels under the Programs. Establish contracts for development of services.
- Prepare for release of new program related to minimal metadata requirements for sharing of neuroscience data, building on workshop recommendations.
- Organize the 2nd INCF Congress of Neuroinformatics in Pilsen, Czech Republic, September 6-8, 2009.
- Contribute as exhibitor and organizer of live neuroinformatics demonstrations at the meeting of the Society for Neuroscience in Chicago, IL, October 17 – 21, 2009
- Participate in international meetings for the purpose of informing the international community about services and activities of the global INCF network.
- Prepare for follow-up of the Nodes Workshop in 2008 with a new meeting in late 2009 or early 2010. Stimulate development of new INCF National Node interactions and developments.
Financial Summary

Summary Financial Report 2008, in kSEK, kUSD, and kEURO

**Income Statement**

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<th>kSEK</th>
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<td></td>
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<tr>
<td>Total Income</td>
<td>18 607</td>
<td>2 392</td>
<td>1 693</td>
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**Expenditure**

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<tr>
<td>Staff Expenses</td>
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<td>Running Expenses</td>
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<td>Program Expenses</td>
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<td>Professional Services</td>
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<td>Secretariat facilities</td>
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<td><strong>Total expenditure</strong></td>
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Depreciation

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**Total Expenditure**

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<td>-17 122</td>
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<td>-1 558</td>
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**Retained Funds**

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<tr>
<td>Retained Funds 2007 Balance Carried Forward</td>
<td>24 216</td>
<td>* 3 113</td>
<td>*2 203</td>
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<td>Increase in Retained Fund 2008</td>
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<td>135</td>
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<tr>
<td>Interest Income</td>
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<td><strong>Total Retained Funds 2008</strong></td>
<td>26 581</td>
<td>3 417</td>
<td>2 418</td>
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Average exchange rate

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<td></td>
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*Note: Funds are held in SEK. Each Annual Report uses average exchange rates for that year.*
Annex: INCF Financial Contributions

INCF Participants

Belgium  
Czech Republic  
Finland  
France  
Germany  
Italy  
Japan  
The Netherlands  
Norway  
Poland  
Sweden  
Switzerland  
United Kingdom  
United States

The INCF is supported by:

• Contributions from the participating countries, based on Gross Domestic Expenditure on Research and Development

• The European Commission (Special Support Action: INCF)

• The Swedish Foundation for Strategic Research

• The Swedish Government (support in addition to contribution as member country)

• The host institution for the INCF Secretariat: Karolinska Institutet, and the Royal Institute of Technology, Stockholm
Annex: INCF Governing Board

Chair: Sten Grillner
Vice Chair: Shun-ichi Amari

Members:
Belgium    Monnik Desmeth, Erik De Schutter
Czech Republic   Mirko Novak, Vaclav Matousek
Finland    Ulla Ruotsalainen
France    Bernard Bioulac
Germany   Christiane Buccholz
Italy    Luciano Milanesi, Francesco Beltrame
Japan    Shun-ichi Amari, Shiro Usui
Netherlands   Jaap van Pelt
Norway    Svein Dahl, Mari Nes
Poland    Andrzej Wrobel, Daniel Wojcik
Sweden    Anders Lansner, Jeanette Hellgren
Switzerland   Rodney J. Douglas, Carmen Adusumalli
United Kingdom   David Willshaw, Katherine Giles
United States   Maryann Martone

Executive Secretary: Jan Bjaalie

Annex: INCF Secretariat Staff

Jan G. Bjaalie   Executive Director
Hui Wang   Deputy Executive Director
Mikael Naeslund   Executive Advisor
Raphael Ritz   Scientific Officer
Janis Breeze   Program Officer
Pontus Holm   Program Officer
Elli Chatzopoulou  Scientific Information and Public Relations Officer
Jeanette Hellgren Kotaleski   Special Advisor
Ylva Lillberg   Usability and Requirements Analyst
Anders Larsson   Systems Developer and IT Administrator
Karin Gabrielson   Controller
Linda Flodin   Administrative Assistant
Sonia Olsson   Administrative Assistant
Annex: Publications and Background Material

Workshop reports:


Technical Reports:


Articles:


Conferences:


Background material
