

XooNips 研究会 2010関西ワークショップ  
 「つくる」「うごかす」「入力する」  
 -XooNipsで機関リボソトリ構築を体験する-

Jan 21<sup>st</sup>, 2010  
 近畿大学東大阪キャンパス

## ニューロインフォマティクスの展開と展望

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## Neuroinformaticsとは

脳のシステムの理解を目指して、多様で膨大なデータを総合的に分析・解析・統合する、脳神経科学と情報科学・技術の新しい分野

### Neuroinformaticsの中核的要素

- 相互運用可能なデータベース
- データ収集、解析、可視化、配信、データ共有のための共有ツール
- 理論解析環境: コンピュータおよびシミュレーションによるアプローチ

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

## Understanding the brain as a system

### Integration through mathematical modeling approach

Life as a dynamical system can be best described by mathematical models.

Bottom-up → Computational Neuroscience ← Top-down

Gene to Protein → Ion-channel → Neuron → Neural circuits → Brain

Molecular Biology → Cell physiology → Neurophysiology → Brain science Behavioral Science Psychophysics

Mathematical modeling is a powerful tool to integrate and understand life's complexity from the gene level to higher brain functions !!  
 Database of synthesized knowledge with what we understood about the system needs to continue to improve, add, apply, ... much better synthesis.

Integration, sharing, succession of our scientific knowledge

## INCF

### International Neuroinformatics Coordinating Facility

**Neuroinformatics:**  
 an interdisciplinary research area, combining research in neuroscience and Informatics (including computation) to develop and apply advanced tools and approaches needed for understanding the brain.

OECD Mega Science Forum  
 OECD Global Science Forum

International Neuroinformatics Coordinating Facility

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

## "INCF at a glance"

INCF is an international organization devoted to enhancing the field of neuroinformatics.

The International Neuroinformatics Coordinating Facility  
 - the first three years -

"Annual Report 2009"  
 "INCF - the first three years 2006-2008"  
 "Strategic Plan 2011 - 2015"

<http://incf.org/about/publications>

## 視覚系のニューロインフォマティクス (Neuroinformatics Research in Vision)

振興調査費 (1999-2004 PI:Usui)

Existing Databases: Channel, Morphology, Synapse, Imaging, Brain atlas, Published paper

G1 Virtual cell: Mathematical model of a single cell

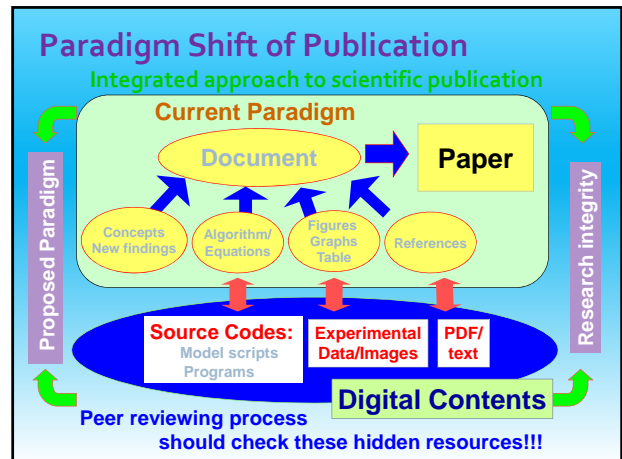
G2 Virtual retina: Mathematical model of retinal circuit

G3 Virtual central nervous system of vision: Mathematical model of cortical map, Mathematical model of motion perception, Mathematical model of color and form perception, Mathematical model of higher-order visual functions

G4 Applications: Artificial vision device

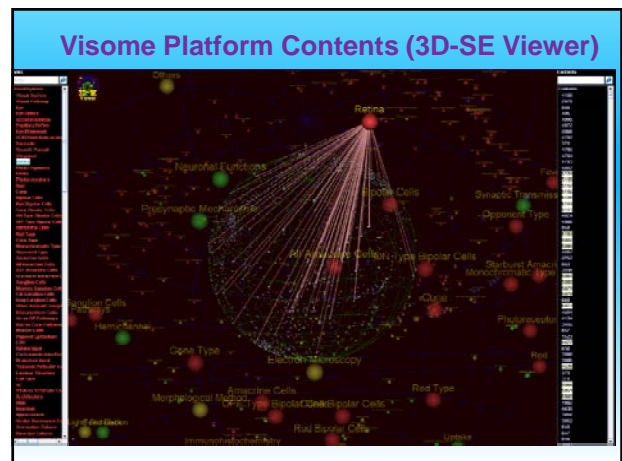
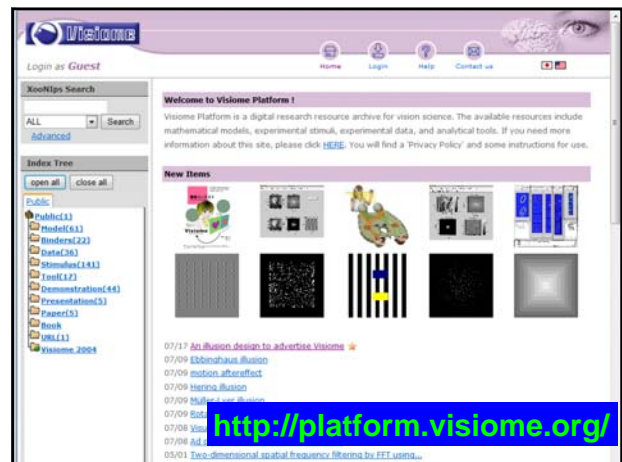
G5 Support environment: Modeling support tools and simulators, Library of algorithms for data analysis

Visiome Environments: Visiome Platform, Personal Visiome



### Digital Contents in Neuroscience

Type	Description	Type	Description
Model	Model Programs/ Scripts	Binder	Collection of specific themes or interests
Data	Experimental Data/ picture/movie formats	Reference	Historic/ Review/Regular reference information
Tool	Programs/ Scripts for data analysis	Book	Historic/ Text book information
Stimulus	Stimulus data in text/ picture/movie formats	URL	URL of other internet resources
Simulator	Simulation software / Neuron, Genesis, etc.	Comment	Users' comments on items
Presentation	Presentation files	Memo	Users' memo on items



### Base Platform: XoonNips

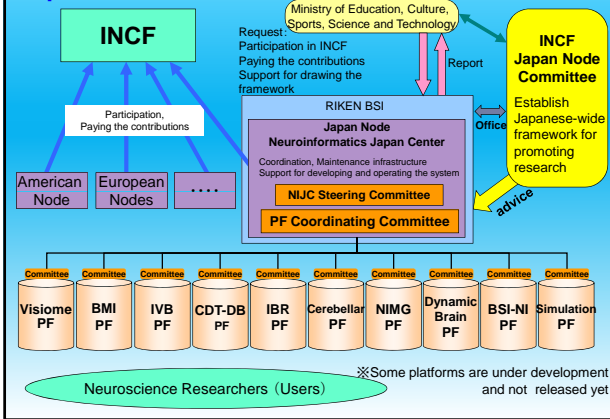
Customizable Neuroinformatics Base Platform System

<http://xoonips.sourceforge.jp/>

### Affiliations of the Japan-node Members

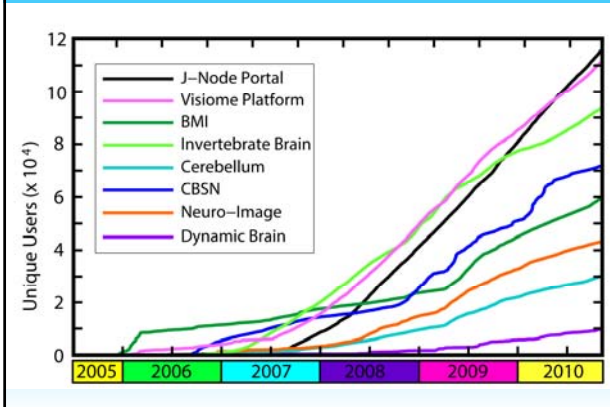


### Japan Node Scheme

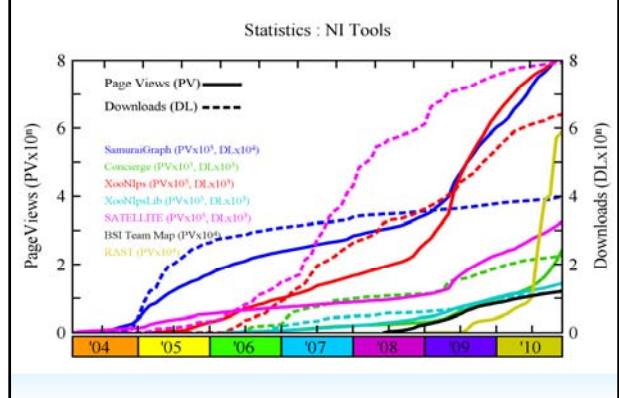


<http://www.neuroinf.jp>

### ポータルおよび各Platformのトップページ アクセス数



### Top-Page Access Statistics for the Tools







ありがとうございました。

ご協力できることがありましたら  
いつでも連絡ください！

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