

Overview

This course aims to understand the human brain and to achieve new machine intelligence (artificial intelligence) based on brain information processing functions. We conduct research and educate students on Computational Neuroscience on cutting-edge machine intelligence (artificial intelligence) with such methodologies as Brain Decoding, Brain Machine Interfaces, Neurofeedback, and Robot learning. Based on our approach, the goal of ATR, which is an internationally recognized center for computational neuroscience, is cutting-edge research.

Research topics

- Neurofeedback
- Reinforcement learning for humanoid robot control
- Measurement Data
- Decoding brain signals
- Brain-Machine Interface (BMI) in Daily Life
- Computational Model of Decision-Making

Symbiotic system Laboratory (NEC Central Lab.)

Only Panel

Overview (Inspiration computing, Co-creation communication)

The laboratory studies a new type of information system which can create new values by collaborating with people. This study is based on researches on human intention, intellectual productivity, and supporting human intelligent activity. We imagine the future where people will live with intelligent artifacts to realize their potential.

Research topics

- Brain-Inspired Computing Architecture
- Design of Intelligent System Programmability
- Human Factors in ICT Systems

Molecular Bioinformatics Laboratory (AIST/Ueno & Fukui)

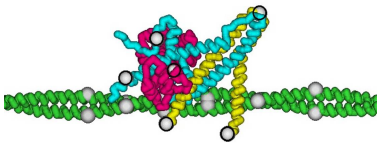
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Overview (bioinformatics, molecular dynamics simulations, high performance computing)

In order to understanding functions and mechanisms of proteins and biological macromolecules, this laboratory focuses on computational studies and software development of bioinformatics based methods. Including an exhaustive search strategy with large scale computers and method of experimental data analysis recovering information loss in the incomplete data set, methods of computer science is applied in studies of life science toward a knowledge discovery.

Research topics

- Three dimensional reconstruction of proteins by electron microscopy
- Molecular simulations of protein-protein interactions
- Software development of the script editor for molecular animations



Technology of Radiological Science (NCVC)

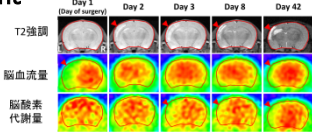
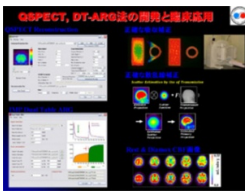
Only Panel

Overview (PET, SPECT, MRI, Molecular imaging, Medical imaging processing)

The laboratory is located at National Cerebral and Cardiovascular Center (NCVC) and aimed at developing advanced medical imaging diagnostic devices and image processing software programs, which can provide functional images in clinical services. The group is unique involving experts from various fields, and collaborate with medical institutions and companies.

Research topics

- Clinical diagnostic imaging
 - Quantitative and standardized SPECT imaging
 - Rapid and quantitative PET systems, – MRI
- Molecular imaging for pre-clinical studies
 - Evaluation of new therapies and drugs
 - Development of tracers for physiological functions
- Key technology development
 - Image reconstruction
 - Motion correction
 - Image processing
 - Image registration
 - Tracer kinetic analysis



Network Orchestration Laboratory (NICT)

A316 (iplab)

Overview (Large-Scale Network Infrastructure, New Generation Networks)

We are conducting research on the technologies that enable the evolution of the Internet in collaboration with NICT. In particular, we are developing JGN-X, our global network testbed, to stimulate R&D activities on novel network infrastructure technologies, large-scale experiments, and international joint projects.

Research topics

- New Generation Network Technologies
 - Solve the problems with the Internet
- Network Testbed Technologies (JGN-X)
 - Enable environment for large-scale experiments
- Software-Defined Network Technologies
 - Realize programmable networks
- Virtual Network Technologies
 - Provide your personalized environment everywhere

