Robotics Laboratory (Ogasawara Lab.)　　A111

Overview (Sensing, Life support, Service robots)

A robot is an intelligent system that obeys real world dynamics while interacting and communicating with humans. Such a system requires sensing real-life environments in real time. In our laboratory, we develop real-time sensing technologies, such as robot vision and tactile sensing, and integrate them into intelligent systems.

Research topics

★ Manipulation of deformable objects by a robot arm
★ Household tasks by dual-arm robot *HIRO*
★ Institution guide by mobile robot *Pioneer*

● Real-time motion generation by a humanoid robot
● Eye contact with an android robot
● Hand motion estimation from forearm deformation

Intelligent System Control Laboratory　　A111, B607

Overview (Systems Control, Machine Learning , Mechatronics)

Our research interest covers basic theories and applications for "Systems Control", "Machine Learning for Control" and "Sensing & Signal Processing".
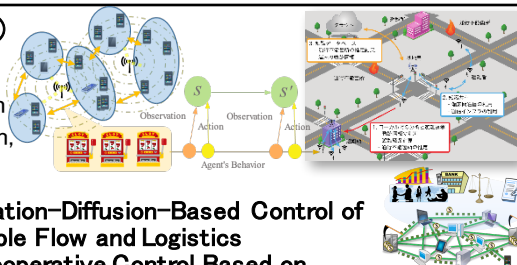

Research topics

★ Pneumatic Muscle Driven Robot Hand Control
★ Reinforcement Learning of Robot Motor Skills
★ Object Tracking by Mobile Robot
● Feedback Error Learning for Control
● Multi-Agent System for Control

Large-Scale Systems Management Lab. (LSM Lab.)　　B707

Overview (Decision Making Mechanism, IoT Cooperative Control)

The research of Large-Scale Systems Management Laboratory is aimed at creating decision making mechanism for social systems with uncertainty, based on cutting-edge IoT-based information acquisition, big data analytics, and machine-learning techniques.
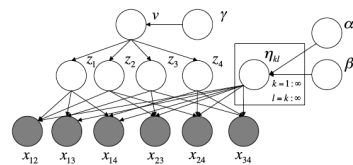

Research topics

★ Automatic and Risk-Aware Evacuation Assistance Based on Cooperation between Evacuees and Mobile Nodes
★ Virtual-Currency Mining Demo
★ Demo of Hadoop for Bigdata Analytics
・ Controllable P2P contents distribution

・ Information-Diffusion-Based Control of People Flow and Logistics
・ IoT Cooperative Control Based on Reinforcement Learning and Game Theory
・ Advanced Data Structures and Algorithms for Large-scale Graph Processing
・ Physical Layer Security-Based IoT Communication

Mathematical Informatics Laboratory (Ikeda Lab.)　　A607

Overview (Mathematical Models Everywhere!)

The laboratory studies mathematical models for mathematical biology and signal processing in engineering that include machine learning, cell biology, brain informatics, medical science, robot rehabilitation, social interaction, and automotive engineering.

Research topics

★ Rehabilitation System with 3D Sensors
★ Attention Modeling by Measuring Gaze
● Machine Learning Theory and Methods
● Methods for Animal Behavior Analysis

★ Human-Robot Interaction
★ Math Models of Driving Behaviors
● Anomaly diagnosis by big-data analysis
● Cell Migration Model Base on Imaging