Computing Architecture Laboratory (Nakashima Lab.) B406

Overview (Edge-computing frameworks with digital/analog accelerators and wireless communication)

The miniaturization of semiconductors is now stopping. Heavy software will not automatically run faster. From now on, it is impossible for software engineers to build a system with the desired performance unless you are familiar with accelerators optimized for each purpose, or configure your own hardware by high-level synthesis technology to speed up. Next generation edge-computing frameworks require wide knowledge across software, middleware, and hardware.

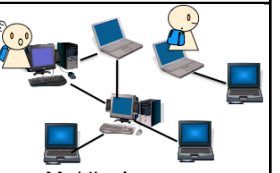
Research Topics

- ★ **Digital/analog mixed systolic-ring accelerators for edge-computing**
- ★ **802.11ah ultra low-power Wi-Fi devices**
- ★ **New-material AI devices**

Dependable System Laboratory (Inoue Lab.) B414

Overview (Dependability for Autonomous Distributed Systems and LSI)

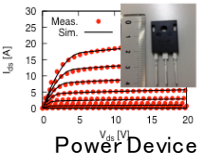
Most existing systems, such as the Internet, clouds, and IoTs, are autonomous distributed systems and the core of their hardware is LSI technology. Our laboratory are working on **algorithms** where each node autonomously works but dependability of a whole system is guaranteed and **design and test technology** for LSIs for testability, reliability and security.



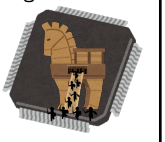
Mobile Agents

Research topics

- ★ Self-Stabilizing Algorithms
- ★ Shared Memory Algorithms
- ● Hardware Trojan Detection
- ● Power Device Modeling
- ★ Nano-scale Distributed Algorithms
- ● Mobile Agent Algorithms
- ● VLSI Design for Testability and Reliability
- ● Machine Learning for LSI Failure Prediction



Power Device Modeling

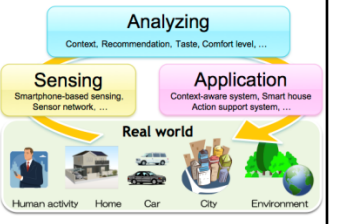


Hardware Trojan Detection

Ubiquitous Computing Systems Laboratory (Yasumoto Lab.) A407

Overview (Smart Home, Activity Support, Participatory / Social / Mobile Sensing, Information Flow, Behavior Change, Internet of Things, Sensor Networks, Data Mining)

Ubiquitous computing systems provide users with more useful services at lower cost than ever before by processing, aggregating, and analyzing real world data sensed with various sensors and by recognizing the physical situations of the real space.



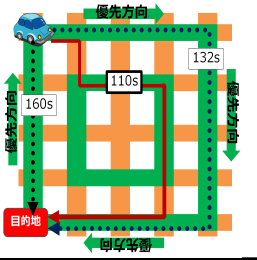
Research topics

- ● Information Flow
- ● Content Curation
- ● Sensing Everything
- ● Health Care System
- ● Smart Office
- ● Participatory Sensing System
- ● Elderly Monitoring System
- ● Disaster Communication System
- ● Smart Sports
- ● Smartphone Sensing
- ● Activity Recognition in Smart Home
- ● Behavior Change and Social System
- ● Distributed Processing among Massive IoT Devices
- ● Social Data Analysis

Mobile Computing Lab (Ito Lab.) A608

Overview (ITS, Mobile, Cloud Computing, Security)

Our lab is engaged in research areas of intelligent transportation systems (ITS), cloud computing, mobile computing in order to realize efficient algorithms truly useful in the real world.



Research Topics

- ● **Traffic Signal Control**
- ★ **Adjusting Parameters in Stereoscopic 3D Video**
- ● **Task Scheduling Considering Turbo-Boost**
- ● **BalloonNet Surrounding a Building**