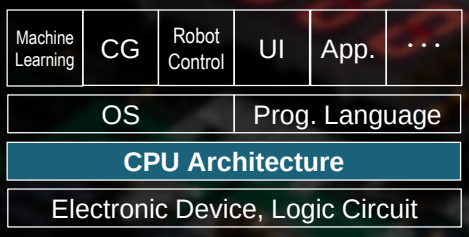
| Name : Ryota Shioya (Associate Prof.) | Field : Computer Architecture |

Ryota Shioya's Group

shioya@ci.i.u-tokyo.ac.jp

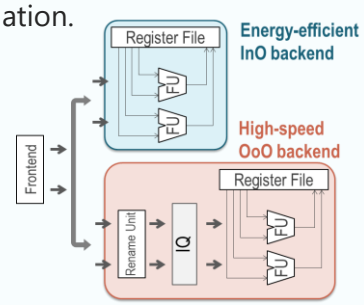


Our group's mission is to improve the performance, energy efficiency, and security of computer systems. We conduct research focusing on CPU architecture and a wide range of relevant topics including program languages, operating systems, and applications.

- A CPU, which executes programs and performs calculations, is the heart of a computer. Research in computer architecture is to explore novel techniques to improve computer systems including CPUs.
- This field is at the boundary between hardware and software. We explore techniques to improve hardware considering software or those to improve software considering hardware.
- We welcome students who have interests in computer hardware or a fundamental layer of software stack such as a compiler, interpreter, virtual machine and OS.

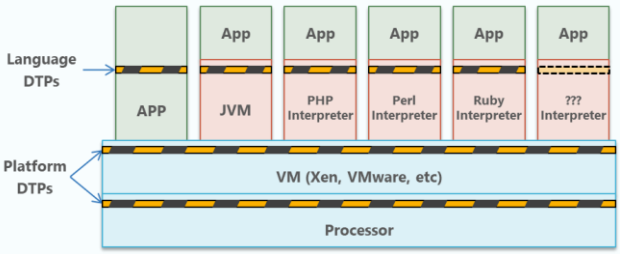
Energy-efficient Hybrid CPU

We introduce different CPUs specialized to various situations, and improve energy efficiency by cherry-picking the specialized CPUs for each situation.



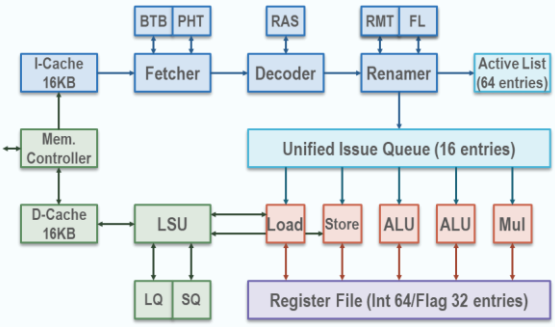
Dynamic Information Tracking for Security

Instead of relying on endless fixes of security vulnerabilities, we explore a "fundamentally secure" system by tracking dynamic information flows.



Advanced RISC-V CPU "RSD"

RISC-V is an open CPU standard, which has recently appeared. This is analogous to the appearance of Linux against a closed OS. We are conducting research and development of advanced RSIC-V compatible CPU "RSD" that introduced our research results.



Other Research Topics

- Hardware Assist for Scripting Languages
- Lightweight Memory Protection for WEB Browser
- Instruction Fetch Techniques for Server Apps.
- Multiport Memory Construction Method for FPGA
- SRAM Circuit Simulator
- CPU Pipeline Visualization Tool