CSE 240A
SP19
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Project Proposal

Summary

I intend to do project #4, the literature survey on a specified topic. My topic will be instruction set architecture design. I will be discussing current research and limitations in ISAs as documented in peer-reviewed journals.

Details

ISAs evolve quickly to balance the cost/efficiency tradeoff and minimize energy/power. I will briefly discuss the history of ISAs and some common tradeoffs as discussed in class, i.e. length, encoding, operations, addressing, and control transfer. I will then explore more advanced topics in ISA design, including system calls, I/O, exceptions, and current problems with x86. Lastly, I will discuss literature that has been published in the last 4 years to demonstrate the current state of ISA design.

References

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2. Domas, Christopher. "Breaking the x86 ISA." Black Hat, USA (2017). https://www.blackhat.com/docs/us-17/wednesday/us-17-Domas-Breaking-The-x86-ISA-wp.pdf
3. Henry, G. Glenn, et al. "Compiler system for a processor with an expandable instruction set architecture for dynamically configuring execution resources." U.S. Patent Application No. 10/127,041. https://patents.google.com/patent/US10127041B2/en
4. Furber, Stephen B. VLSI RISC architecture and organization. Routledge, 2017.
5. Comer, Douglas. Essentials of computer architecture. Chapman and Hall/CRC, 2017.
6. The evolution of RISC technology at IBM by John Cocke – IBM Journal of R&D, Volume 44, Numbers 1/2, p.48 (2000) http://domino.watson.ibm.com/tchjr/journalindex.nsf/0/22d06c5aa961e78085256bfa0067fa93?OpenDocument
7. https://www.strchr.com/x86_machine_code_statistics