Project Topics (mostly study of existing papers)

1. Instruction level parallelism and its exploitation

2. Multiple issue, superscalar and VLIW architectures

3. Multiprocessor Cache Coherence

4. SIMD machines and GPUs

5. Evolution of the ARM processor

6. Different generations of Intel microarchitectures

7. Hardware support for virtualization and cloud computing

8. Domain specific architectures

9. Architectures for machine learning/deep learning

10. TPUs versus GPUs

Project Topics (implementation-oriented)

1. 8-stage pipeline simulator

2. Multicore programming and performance

3. GPU programming and performance

4. Multiprocessor performance and the roofline model

5. Buffer Overflow and internet scanning worms

6. Heap overflow/format string attacks, etc.

7. Microarchitectural attacks

8. Cache-based side channel attacks on DSA and elliptic curve DSA

9. Experiments with Spectre

10. Experiments and mitigation strategies for Meltdown

11. SGX programming

12. Experiments with hardware cache prefetchers on i7, etc.