

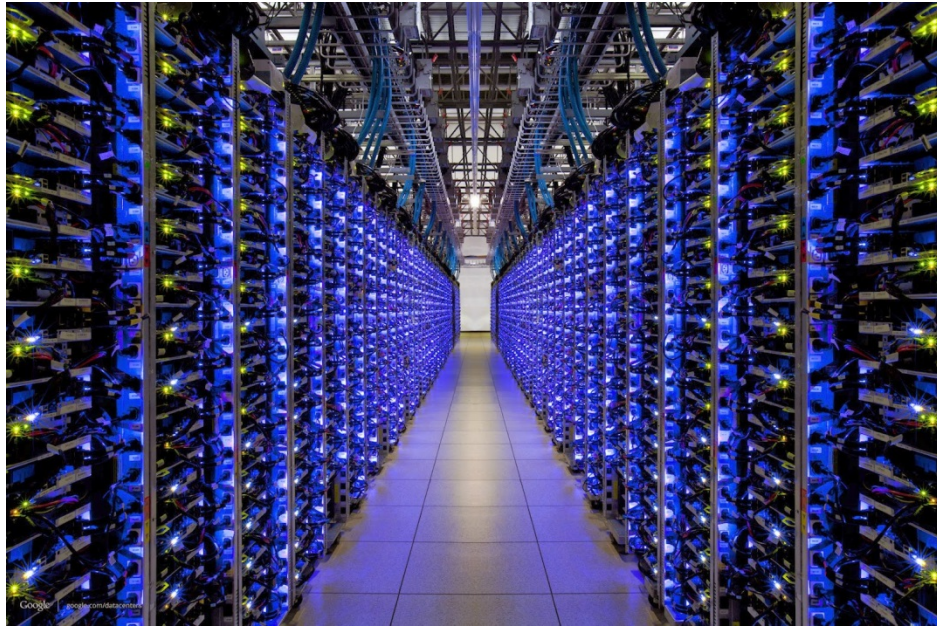
EECS at WSU

Road to High-Performance Computing (HPC)

Dae Hyun Kim

EECS
Washington State University

High-Performance Computing



Google data center



Lawrence Livermore National Laboratory
Sequoia supercomputer

High-Performance Computing



Apple iPhone



Samsung Galaxy



Smart watch

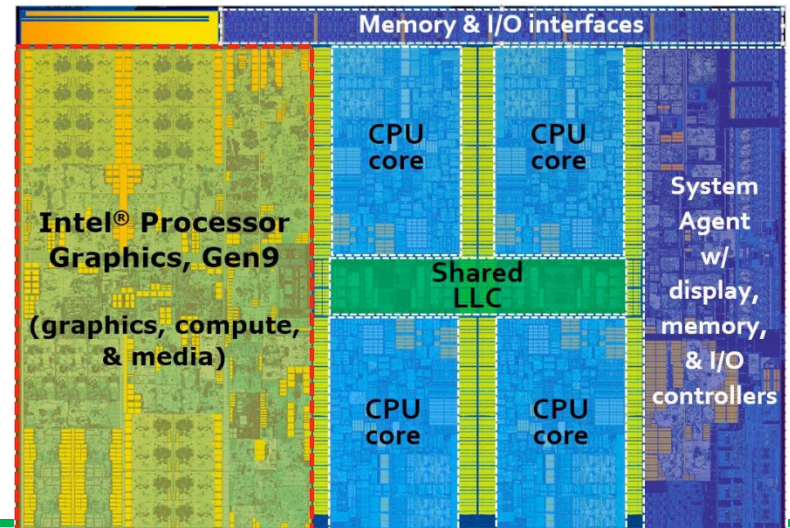
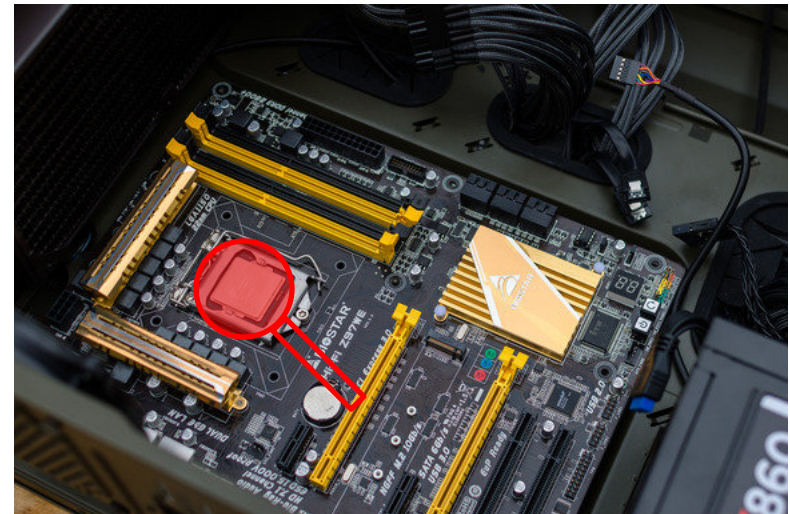


Laptop

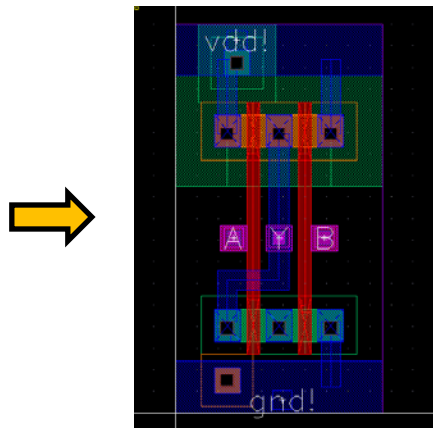
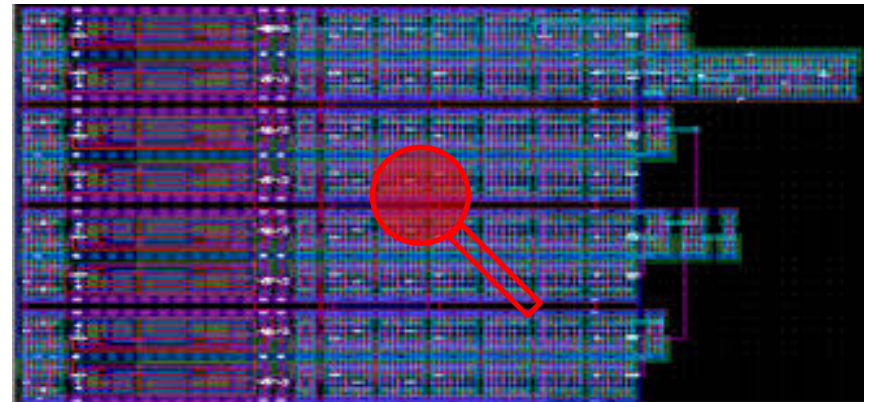
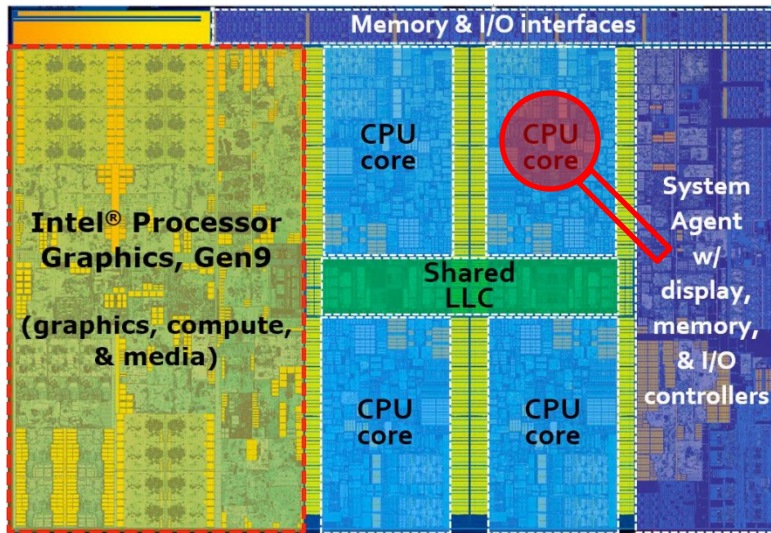


High-performance PC

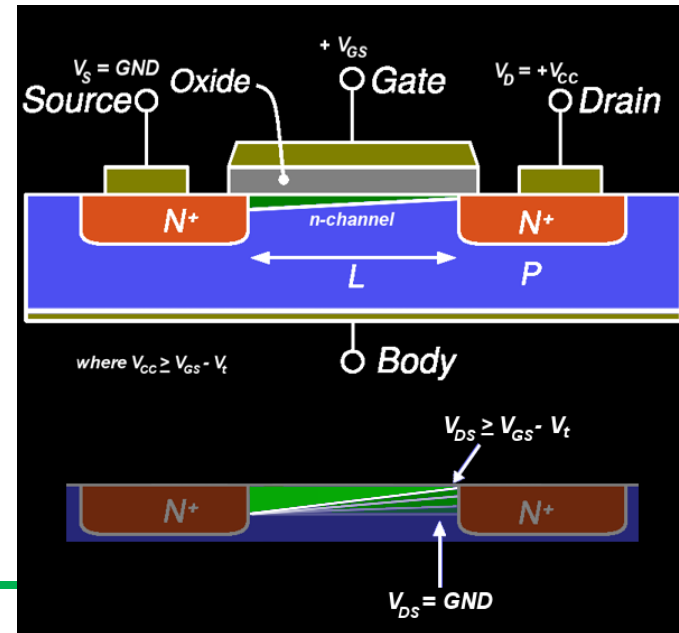
Central Processing Unit (CPU)



Central Processing Unit (CPU)



Transistor



Computer Systems

Applications

Graph processing, big data analysis, network, DB, ...

Compiler

Parsing, optimization, ...

Operating system

I/O, storage, process, hardware control, ...

Computer architecture

CPU architecture, memory, ...

Digital, analog design

Digital VLSI, analog, wireless, ...

Physical layout

Optimization (linear, nonlinear, combinatorial, algorithms, ...)

Semiconductor

Semiconductor devices, fabrication technologies, ...

Physics

Quantum mechanics, solid-state physics, ...

Mathematics

Linear algebra, probability, optimization, ...

Computer Systems

Applications



Microsoft



facebook



Compiler



Operating system

Computer architecture



Digital, analog design

Physical layout



cādence[®]

SYNOPSYS[®]

Semiconductor



Mentor
Graphics[®]



Physics

Mathematics



BROADCOM[®]

Computer Systems

Applications	9 (CS)
Compiler	8 (CS)
Operating system	7 (CS)
Computer architecture	6
Digital, analog design	5
Physical layout	4
Semiconductor	3
Physics	2 (Physics)
Mathematics	1 (Math)



3,5,6



5,6



Dr. Heo

3,4,5



Dr. Gupta

3,4,5



3,5



4,5,6