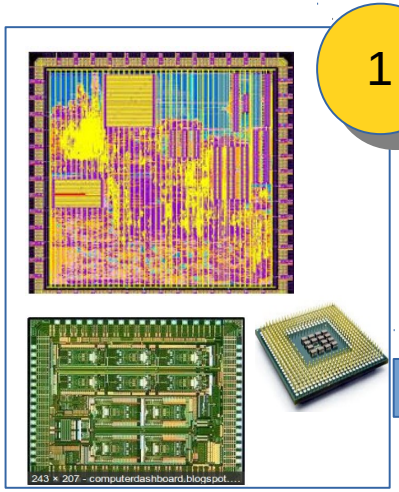
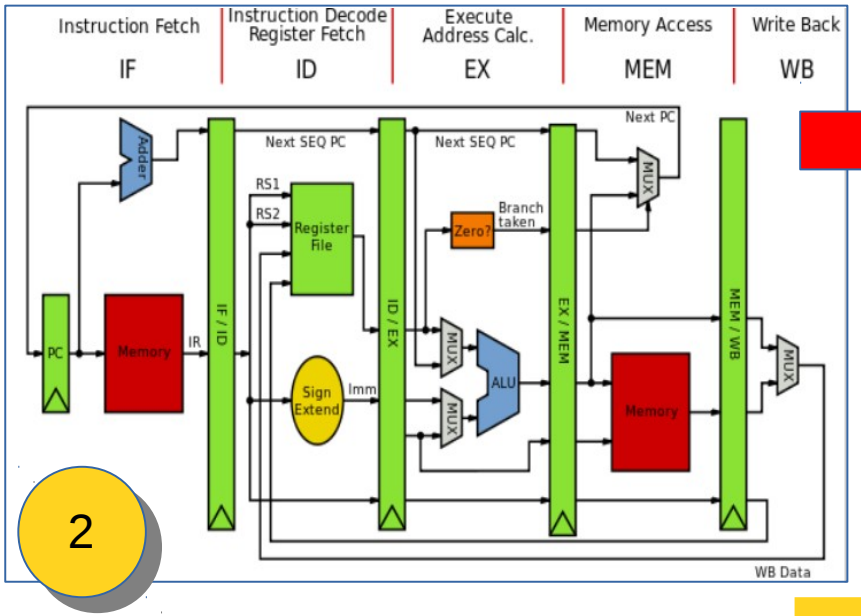
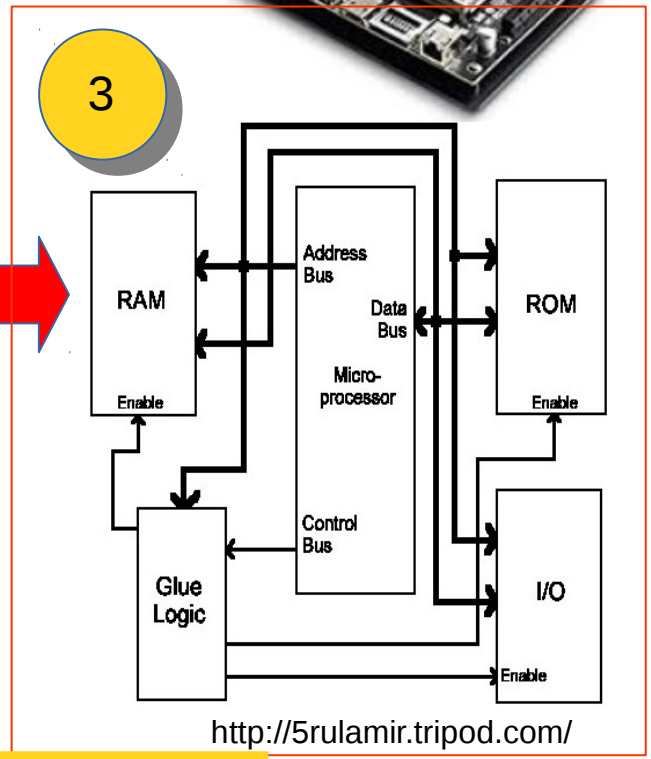
Scope of the Advanced Microprocessor Systems







http://5rulamir.tripod.com/

Physical:

VLSI Design, place and route, bonding and packaging
Tools: Cadence CAD design tools, Verilog language and VHDL language

Architecture:

ALU, Memory Hierarchy, Pipeline, Register Files, Cache etc.
Tools: C, System C, Verilog, VHDL, FPGA for prototyping

Systems:

CPU, bus systems, memory unit, I/O interface peripheral controllers and the design for its optimized operations
Tools: Assembly (more on the compiler design), C/C++, and higher programming language

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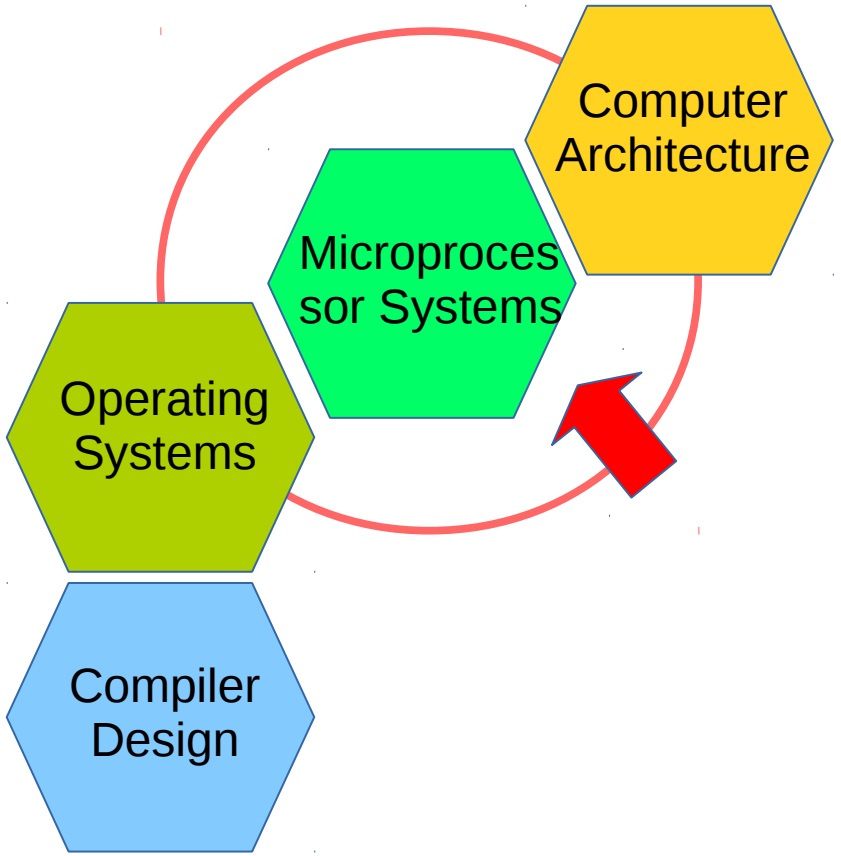
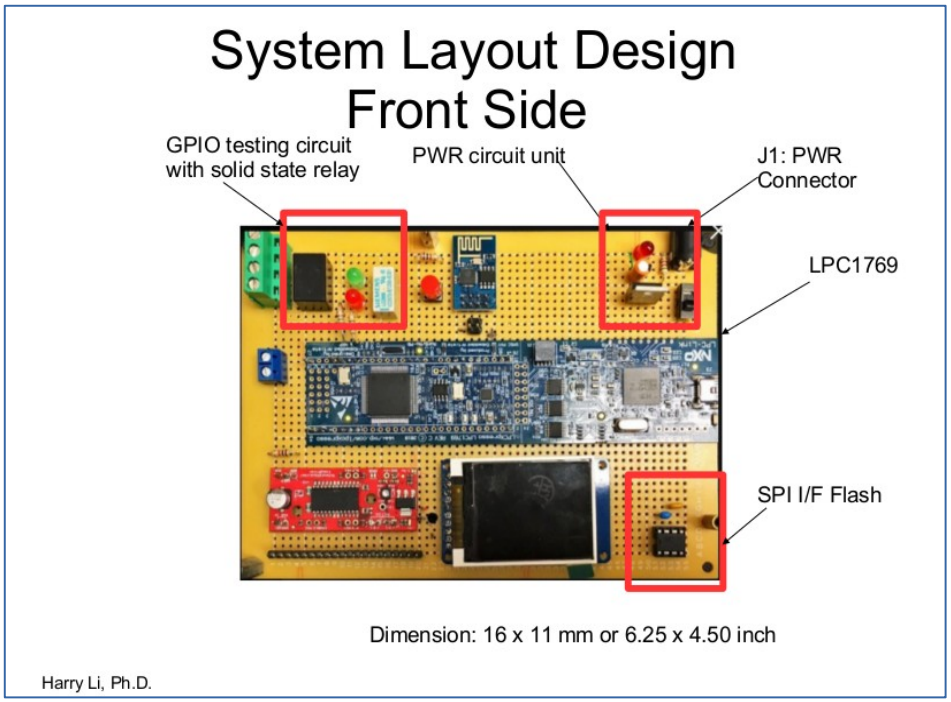
Emphasis On System Aspects

For Advanced Microprocessor Systems

Selection Criterion: (1) Focus on the system aspects; (2) with good understanding of architecture, but not architecture design course, not designing sub-systems and basic building blocks, such memory management unit, bus controller, pipeline etc.



(3) Focus on the system aspects but staying on the microprocessor side of the study with litter or no discussion of OS, to leave the OS aspects out for separate subject to discuss.



Advanced Aspects: GPU

of Microprocessor Systems

1

ARM

Combines an ARM Cortex-A8 CPU with a PowerVR GPU. Apple's iPad, iPhone and Apple TV

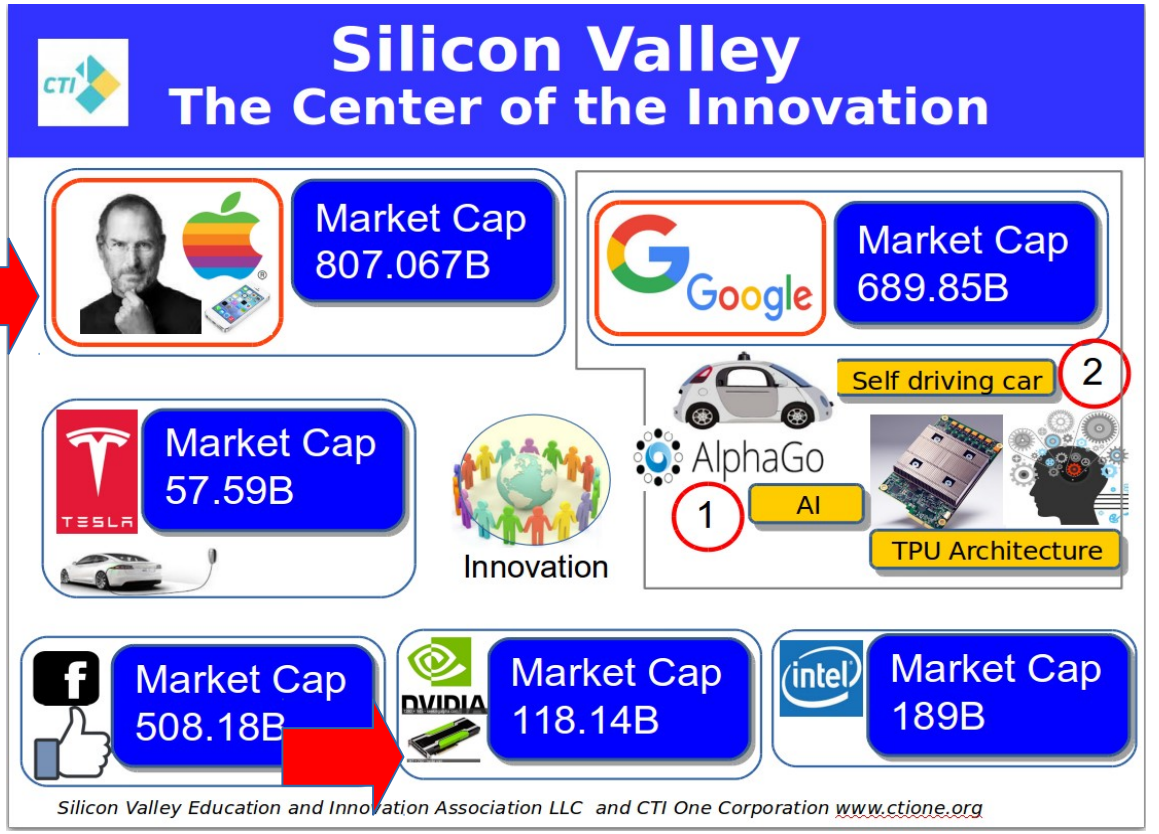
Produced	From September 9, 2015 to Present
Designed by	Apple Inc.
Common manufacturer(s)	TSMC; Samsung
Max. CPU clock rate	1.85 GHz (iPhone 6s, iPhone 6s Plus, iPhone SE, iPad 9.7 2017)

2

GPU

3

Microprocessor+GPU



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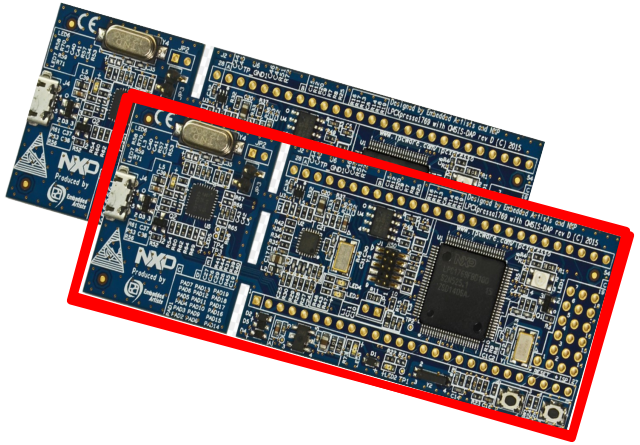
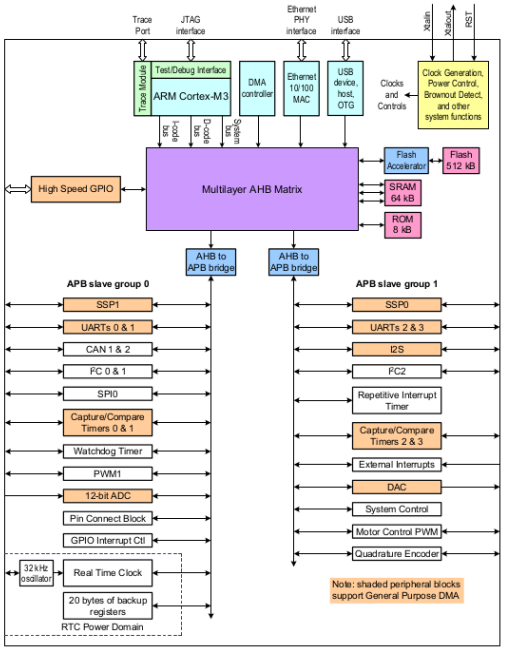
Enhance MCU With Graphics Processing Engine

GE To GPU

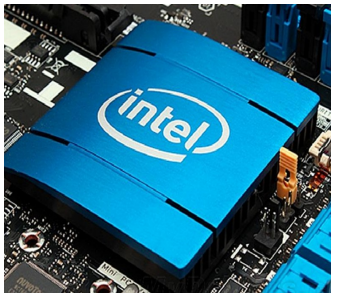
Use LPC 1769



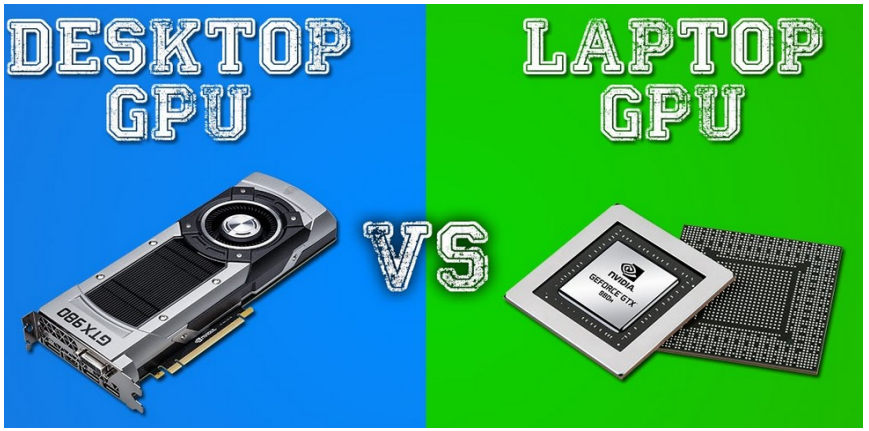


Compare to Desktop or Laptop GPU

Or



+ +



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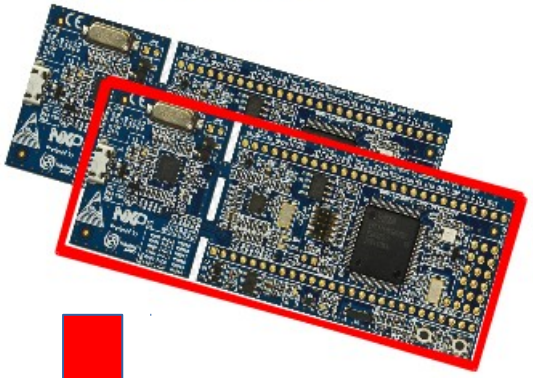
MCU With GE Or (GPE)

Build Its Capability Now

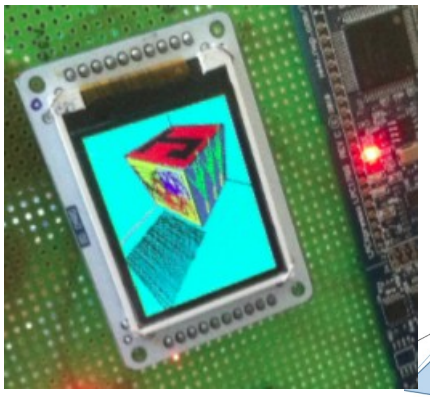
Use LPC 1769

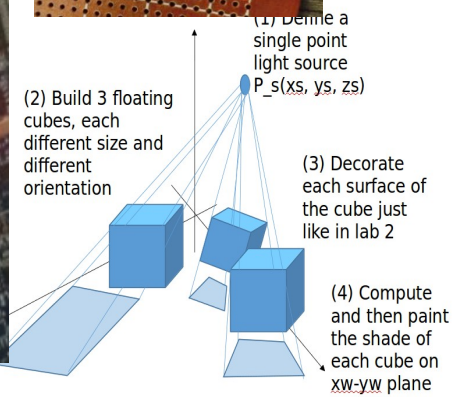


Display Driver

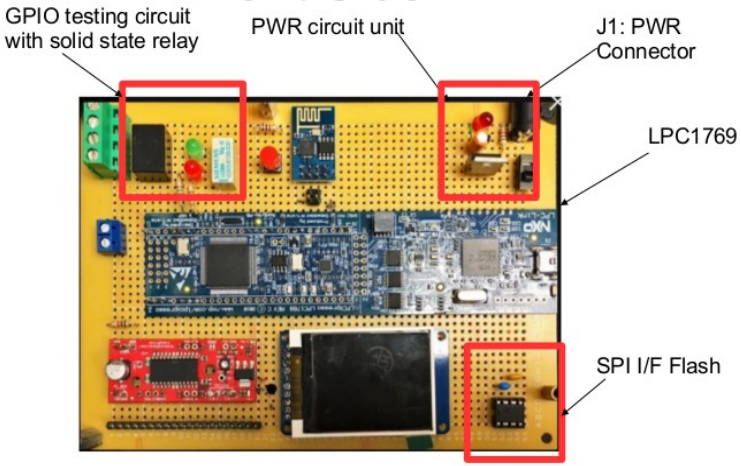
2D GE or (GPE)

3D GE or (GPE)





System Layout Design
Front Side



Dimension: 16 x 11 mm or 6.25 x 4.50 inch

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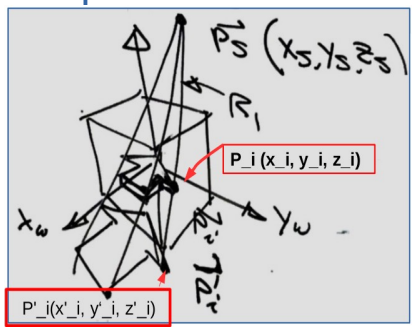
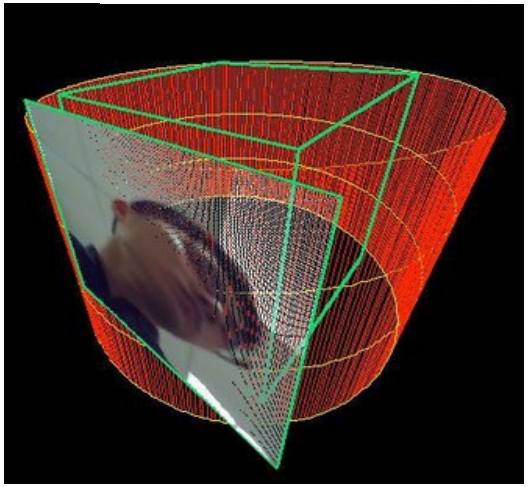
AR





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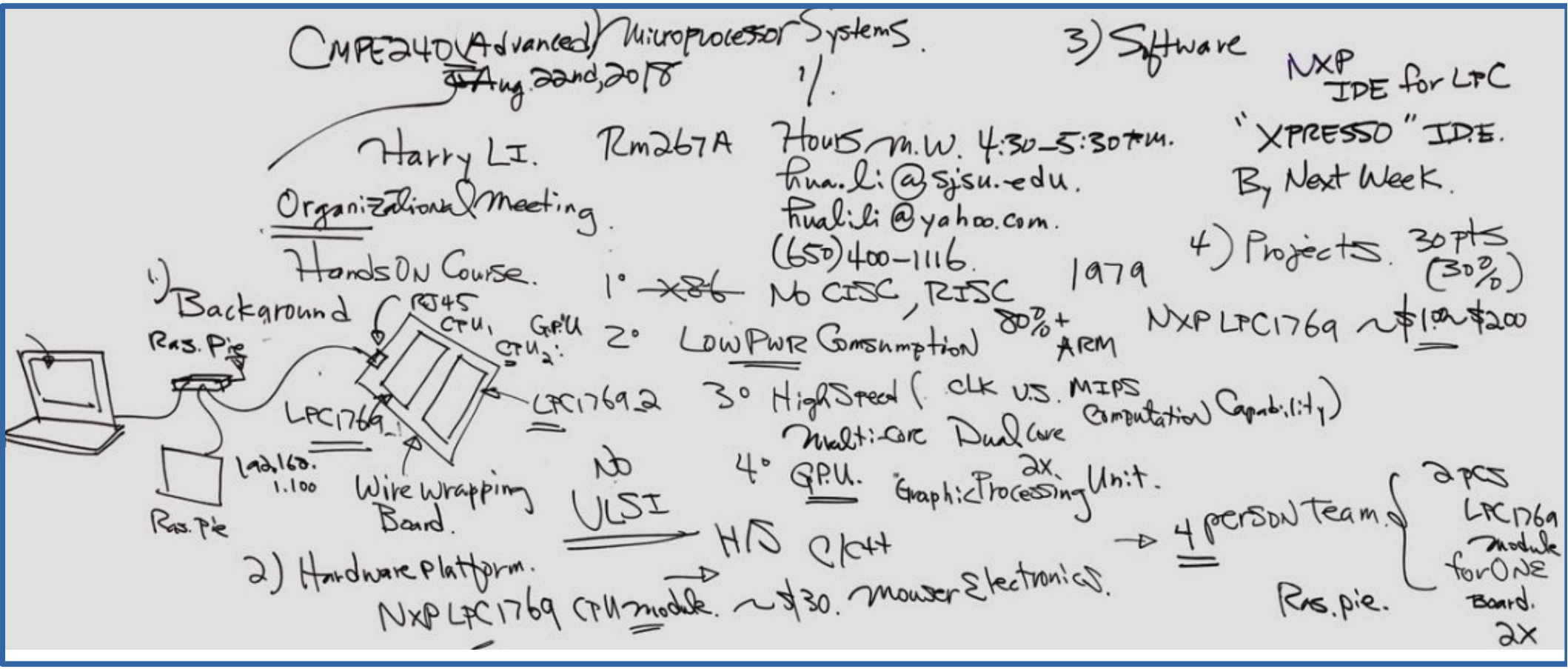
Organizational Meeting



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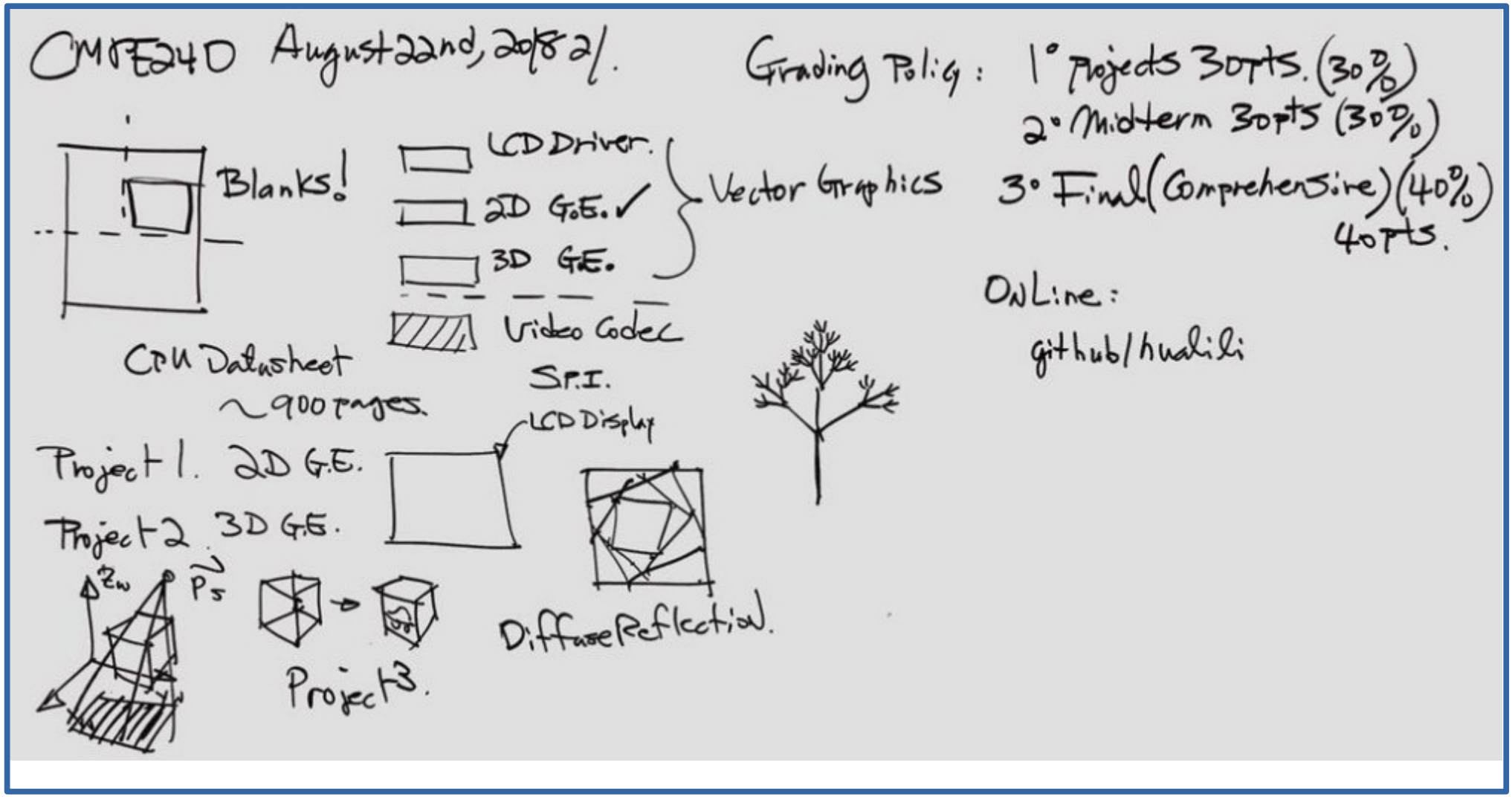
ARM + Multi-core + Graphics Processing Unit



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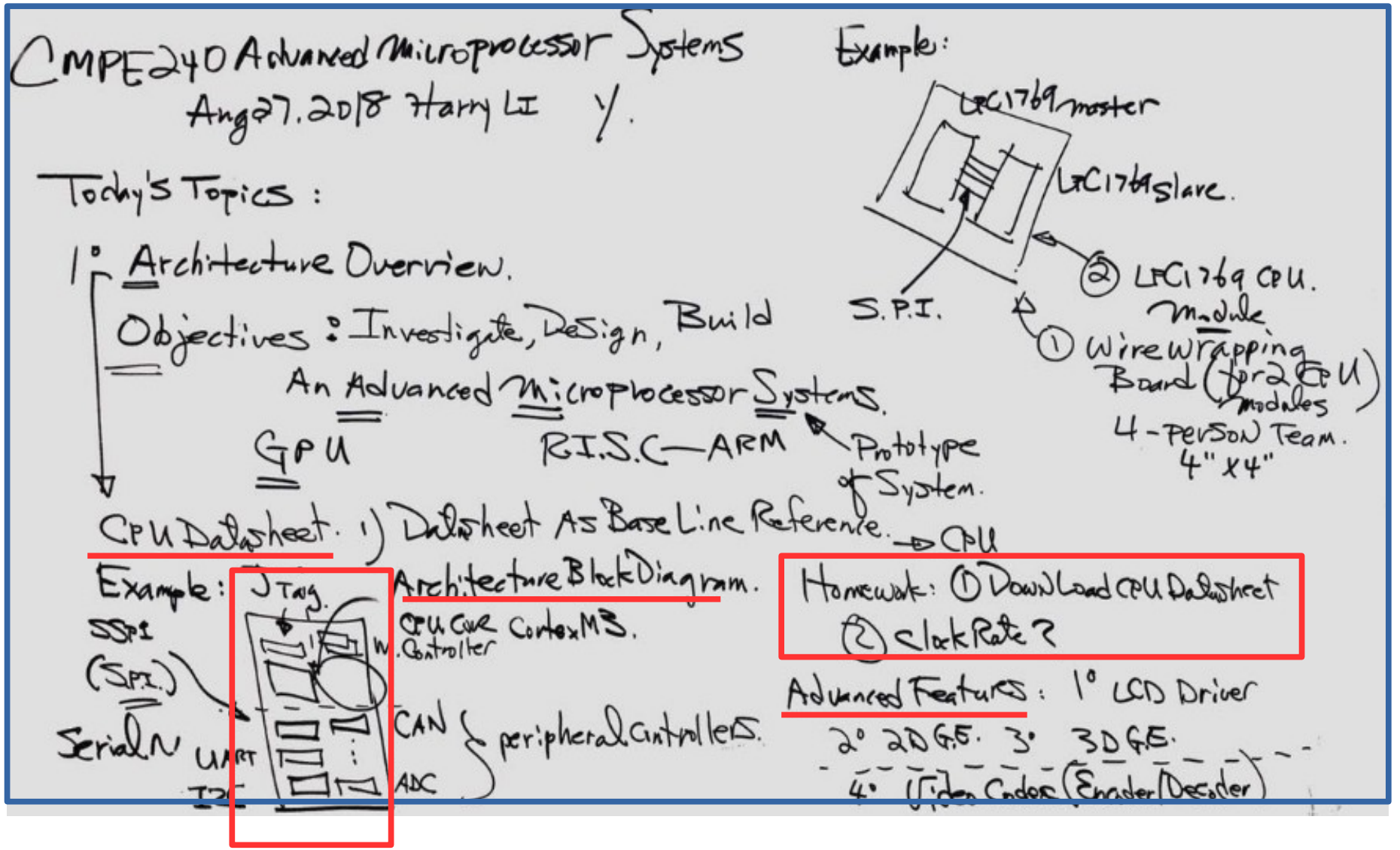
CPU Block Diagram And Prototype Board (1)



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Spec For prototype Board (2)

CMPE240 Adv. Micro.

Table 1. (Spec for the Prototype Board)

No.	Description	Notes
1. Board	Prototyping Board/Wire Wrapping.	
2. CPU module	LPC1769 ARM Cortex-M CPU module	X2 ONE Master ONE AS G.E.
3. PWR.	LM7805 Regulator	Input
4. Adaptor	Wall-mount 7.5VDC or higher Input 110/220AC	~1500mA
5. Debugging unit	O/P test via GPP I/P test via GPP	LED for O/P S/W

No.	Description	Note
6. LCD color	SPI. Colour LCD	phillips/Sitronix ST7735R
7. SPI. Device		

240 x 320 Resolution

x (col)

y (Row)

Note: SPI (Fast) 66Mbps — 100+ Mbps

3+1"

I(x,y)