Individual Project Topics

- Each student must select a topic from the following list. The topic in the following list should include the technology analysis and industrial analysis.
- Each student needs to

  (a) give a 20 min **presentation** on the selected topic and

  (b) write a formal **report** including detail description on your presentation items one week after your presentation in English.
- Submit the following items at eeclass
  - ◆ Submit your topic technical article by 10 / 5 / 2022
  - ◆ Presentation PPT-Individual Project presentation (ppt) (one day before your presentation)
  - ◆ Individual Project report (pdf) (one week after your presentation)
- Content in the presentation and report

A. Technology Analysis

Contents:

1. System Applications / Scenes / Scenarios
2. Motivation / Background / System evolution / Current Status
3. System Functions
4. System Diagram
5. Main **Technology principle** and detail description
6. System Architecture / Specifications / Features
7. Block functions
8. Related technologies

B. Industrial Analysis

Contents:

    a. Industrial Chain: also listed related companies or select one of the most representative company in the field)

    b. **SWOT (Strength, Weakness, Opportunity, Threat)**

9. Future Trend
10. Conclusion
11. References

	CPU
	CPU
CPU-1	Intel Gen 13 Processor i9 Compare with all previous Intel processor and AMD (Intel Launches 13th Gen Intel Core Processor Family Alongside New Intel Unison Solution)
CPU-2	AMD Zen core
CPU-3	AMD -Ryzen 7000 (https://www.amd.com/en/processors/ryzen)
CPU-4	ARM newest CPU
CPU-5	Apple newest CPU
CPU-6	AMD accelerated Processing Unit (APU)
CPU-8	Microprocessor CPU (Cypress/Analog)
	Memory
Mem-1	Memoristor, STT-RAM resistive random accessed memory (ReRAM) technologies are investigated, memristor and spin-transfer torque (STT)-RAM (https://ieeexplore.ieee.org/document/7131587)
Mem-2	Phase Change Memory PCM (An overview of phase-change memory device physics)
Mem-3	Emerging non-volatile-memory (NVM) technologies
Mem-4	Resistive random-access memory (RRAM)
	Interface (BUS IC)
Int-1	PCI-E 5.0
Int-2	Nvidia Mellanox LinkX (cables and transceivers)
Int-3	USB 4.0 Gen 3 Type C
Int-4	Intel Thunderbolts 4.0
Int-5	HDMI 2.1
Int-6	Display Port 2.0 (DP)
	Display
Display-1	Touch panel
Display-2	OLED
Display-3	QLED
Display-4	Flexible Display
Display-5	Mini-LED Micro-LED
	Multi-Media (MM)
MM-1	Comparison of H.265/HEVC Video Decoder and VP9

MM-2	H.266/MPEGX
MM-3	Ambrella 4k/8K image chip for VR
MM-4	Video streaming (NETFLIX)
MM-5	3D or 360 degrees image or video processing
MM-6	Optical Sensor
	Graphic (Gra)
Gra-1	Desktop Graphic processor Nvidia GeForce 30 series (3080 Ti) / 3090 Compare with all previous Nvidia GPU
Gra-2	Data Center - Graphic processor Nvidia A100 Compare with all previous Nvidia GPU
Gra-3	Mobile GPUs Nvidia GeForce 900M
Gra-4	HDR10 (Sony X1 Extreme 4K HDR)
Gra-5	360 degrees video (Insta360)
Gra-6	ARM-Radeon
Gra-7	Nvidia Titan RTX
	Wireless Communication Technologies (Com)
Com-1	LTE-4G
Com-2	LTE-5G MediaTek Dimensity 700 5G
Com-3	LTE-5G Qualcomm Snapdragon X55 5G modem
Com-4	Qualcomm 5G New radio (NR)
Com-5	Starlink
	Wireless Interface (Wlinf)
Wlinf-1	Bluetooth BR/EDR (basic rate/enhanced data rate) and Bluetooth LE (Bluetooth low energy)
Wlinf-2	Zigbee
Wlinf-3	RFID
Wlinf-4	Near Field Communication (NFC) Application
Wlinf-5	Wifi 6/6E
	Video Game (VG)
VG-1	XBOX Series X
VG-2	Sony PlayStation 6
VG-3	Nintendo Switch

VG-4	Oculus Quest
VG-5	ARM-Advantage
Bio-1	Biomedical IC analysis
Wearable devices (W)	
W-1	Wearable device / smart watch
W-2	Sensors / Intel RealSense 3D camera
W-3	Facebook glass
Internet of Things (IoT)	
IoT-1	Platform
IoT-2	LTE Cat-1 / LTE Cat_M1 (eMTC) / Cat-NB1 (NB-IoT)
IoT-3	IoT chip comparison between TI/Intel/Qualcomm/ARM
AI / Deep Learning (DL)	
DL-1	Deep neural network
DL-2	Recognition/Self-driving (Nvidia PX2)
DL-3	Healthcare AI- robot surgery/virtual nursing
DL-4	Nvidia HGX AI Supercomputer/cloud and data center
DL-5	Nvidia Jetson
Drone (DR)	
DR-1	Technology DJI/Mavic Phantom comparison
DR-2	Drones in warfare
3D sensing (3DS)	
3DS-1	Vehicle technologies
Cellphone (Cell)	
Cell-1	iphone-14 New Features / technologies
Cell-2	Samsung galaxy 22 New Features / technologies
Cell-3	Pixel 6 New Features / technologies
Cell-4	Xiaomi Redmi 10 Prime
Blockchain / Fintech (Fintech)	
Fintech-1	Cryptocurrencies Bitcoin / Ethereum Network
Fintech-2	Agriculture Blockchain / technologies
Fintech-3	Financial service Blockchain / technologies
Fintech-4	Smart Contract Insurance