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Embedded Systems

Makes products:

cheaper
 Smarter
 More reliable
 Connected

Smaller
 higher-functioning
 efficient
 Versatile

Microcontrollers in automobile

ABS

Radio

Airbag

Guidance

Mirrors

Windows

Cruise Control

Security

Temp/Cabin Control

Fuel injection

ECU

Lane centring

rear detection

door opening/closing

Auto parking

wipers (sensing)

Microprocessors vs Microcontrollers

no main memory (cache)	has memory
I/O Limited	I/O Rich
None	ADC
Little Comm	COMM Rich SPI, I ² C, CAN, UART, USART,
Not so much	
None	Timer
MMU	→ MMU
1%	✓✓✓✓ 99%

Embedded TS

Hardware - electrical (analog)

Mechanical ← heat, connectivity, space

Computer hardware & electronics

Sensors

Actuators ← motors, legs

Software ← development cycle
Testing
design
requirements

Softskills.

- * Problem solving skills
- * global environment
- * Writing/Communications
- * Teamwork

(5)

Samsung - phone, TV, Rebridge

Mitsubishi - car, Zero ~~Japanese~~ plane

Nvidia - video card, chip sets

Qualcomm → chips

ASUS -

Intel → chip

Google → phone, OS, automated car, media player

AMD

Apple

Sony

Honeywell

Mentor Graphics

Microsoft.