EE 473
Analysis & Design of Analog ICs

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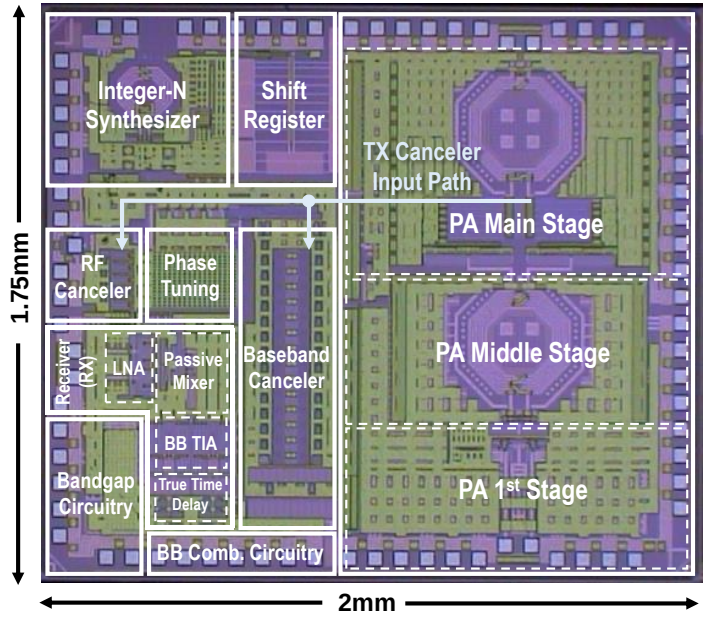
Lecture 1

Lecture #1, Jan 3th, 2022

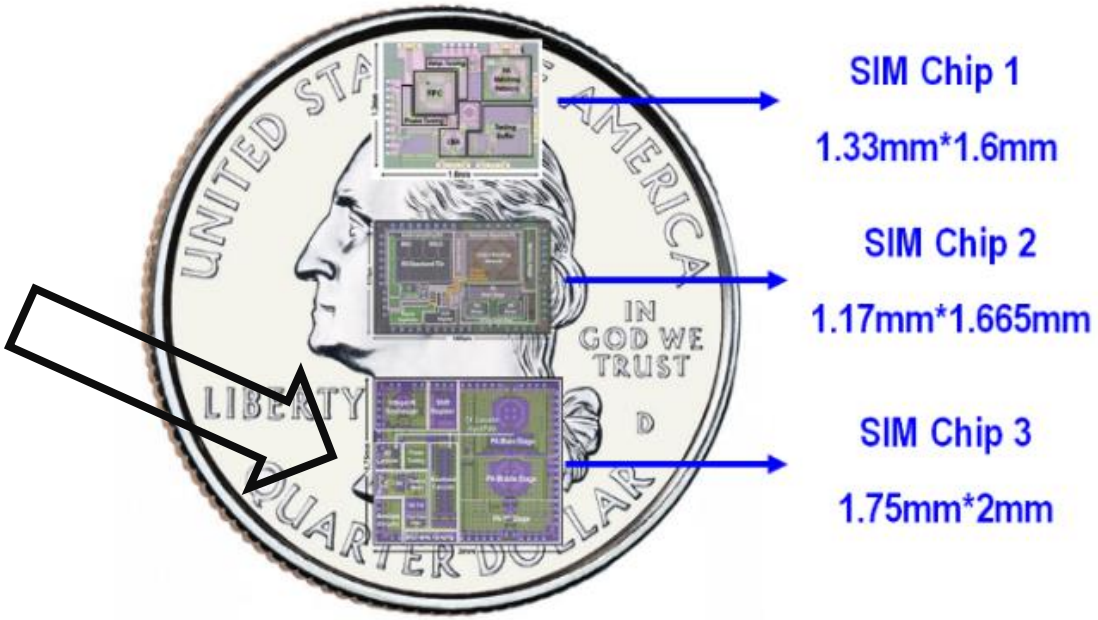
- Welcome back and/or welcome to UW!
- Review Chapter 1 and 2 of Razavi book as needed. Course will start with Chapter 3. Read and Review Chapter 3.1 – 3.5
- Homework #1 & CAD 1 coming.

Modern Systems Integration

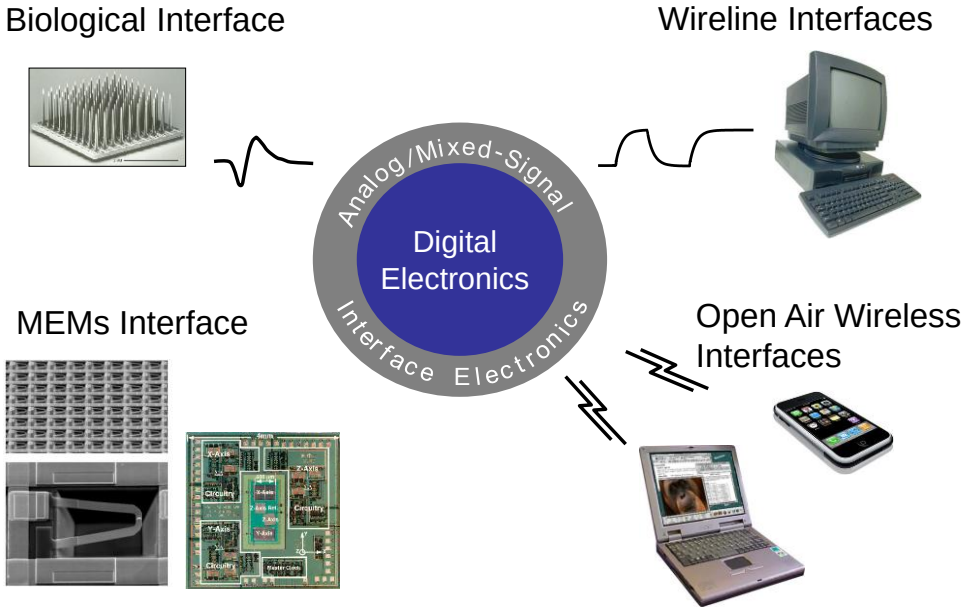
TSMC 40nm Prototype Chip (Full Duplex Radio)



Three Generations of Full Duplex Radio Chips



Integrated Systems (IS) – Sensor and Analog Interfaces to the Real World

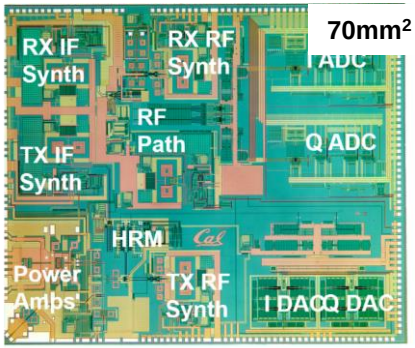


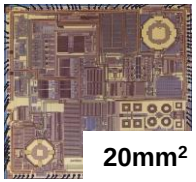
Integrated Systems

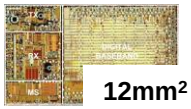
Motorola Dynatac -1979

Nokia 3310 - 2000

Samsung Galaxy S4 - 2013

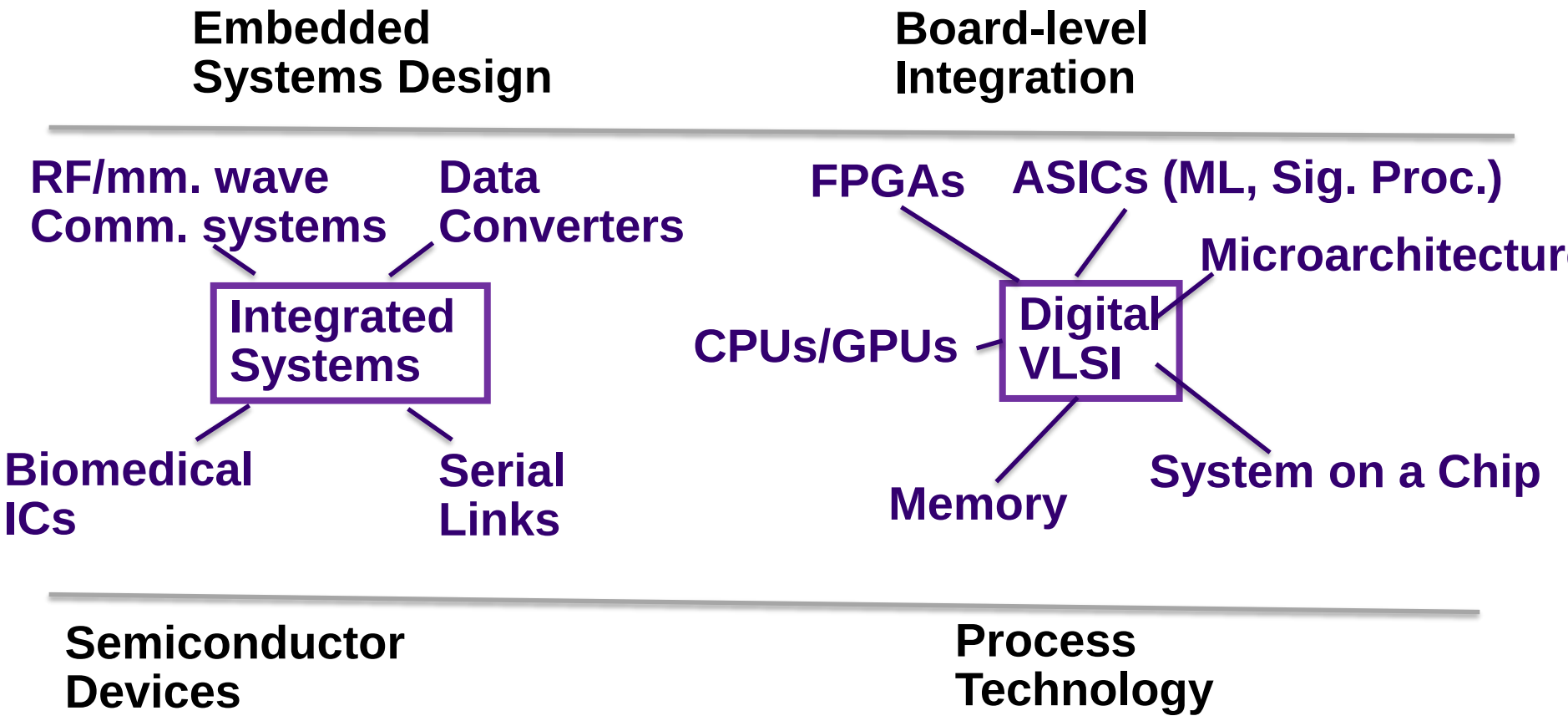






Focus: Advancing Analog and mixed-signal (Analog+digital) capabilities in integrated-circuits

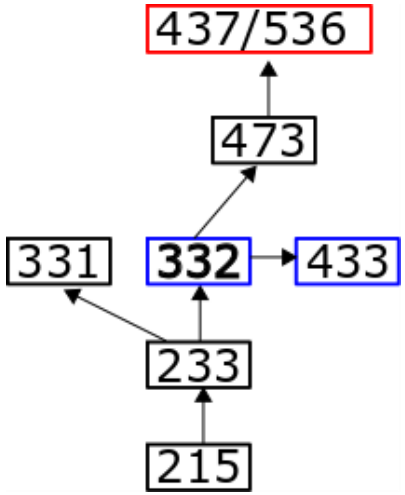
Integrated Systems:



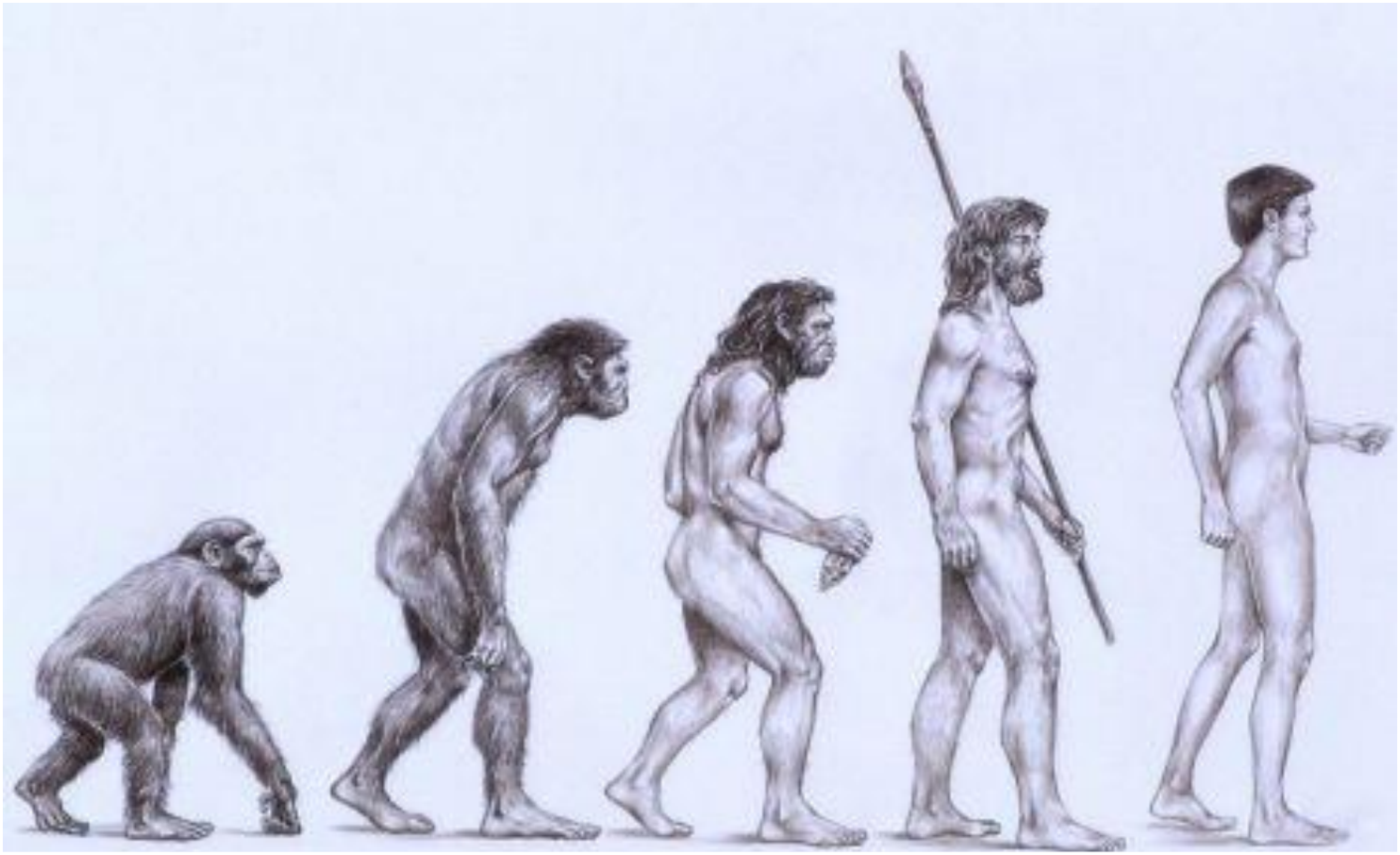
Course Planning: Some Notes

- Take 215, 233, 271 (IMO, regardless of your interest area)
- Most I.S and VLSI courses not offered every quarter ➔ Plan your sequence!
- Is the I.S track right for you? : 332 is a good indicator
- EE 433 could be made optional for Integrated Systems.

Integrated Systems



UW Integrated Circuit Designer Evolution



EE 215
EE 233
EE 2XX (new device class)

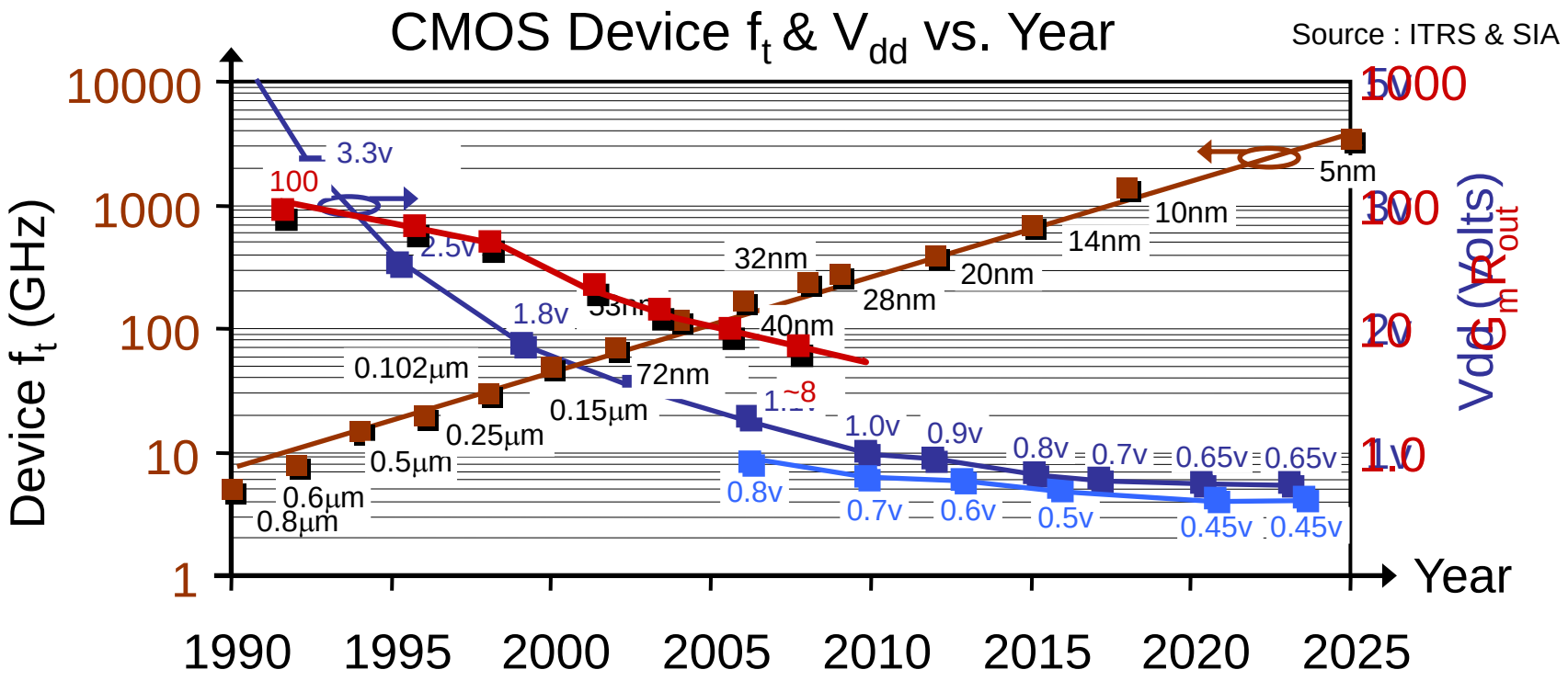
EE 331
EE 332

EE 433
EE 473
EE 476

EE 436
EE 437
EE 477
EE 478

EE 526
EE 536
EE 538
EE 539

nm CMOS: Opportunities & Challenges



- nm length will soon allow operation into Terahertz
- Loosing Gain from single device: now $g_m r_o \sim 10$
- Less available voltage. V_{dd} dropping as low as 0.45