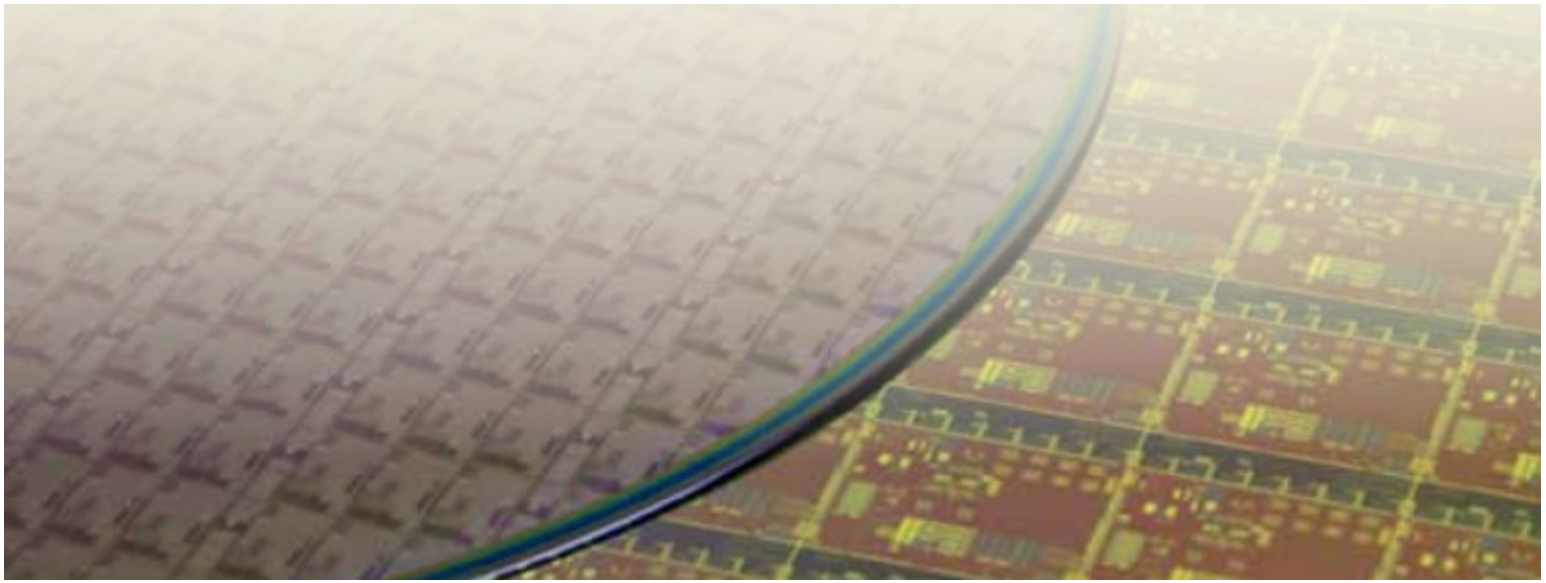

Mixed-signal ICs and Systems Design

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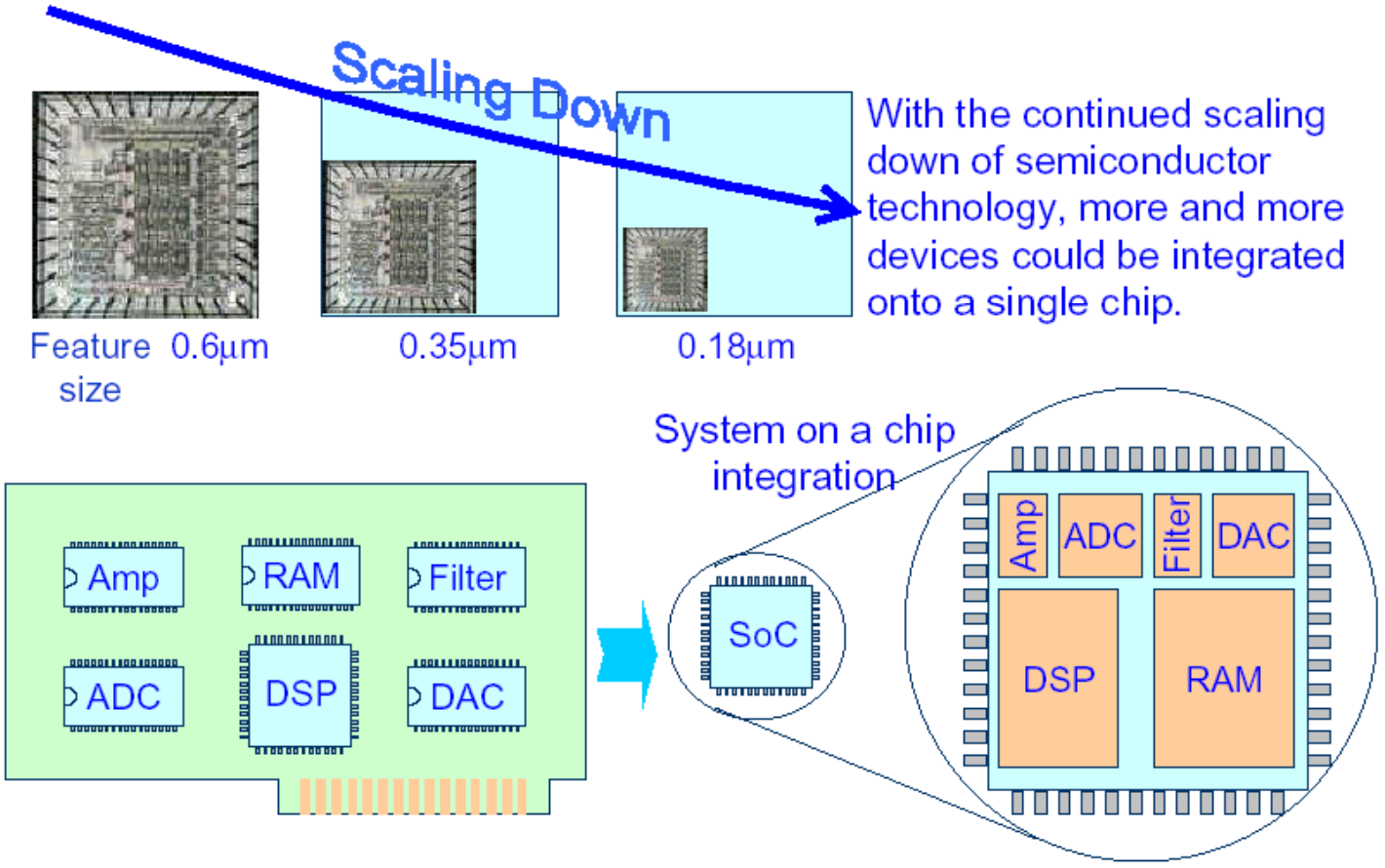
http://groups.google.com/group/apinunt_mixedic

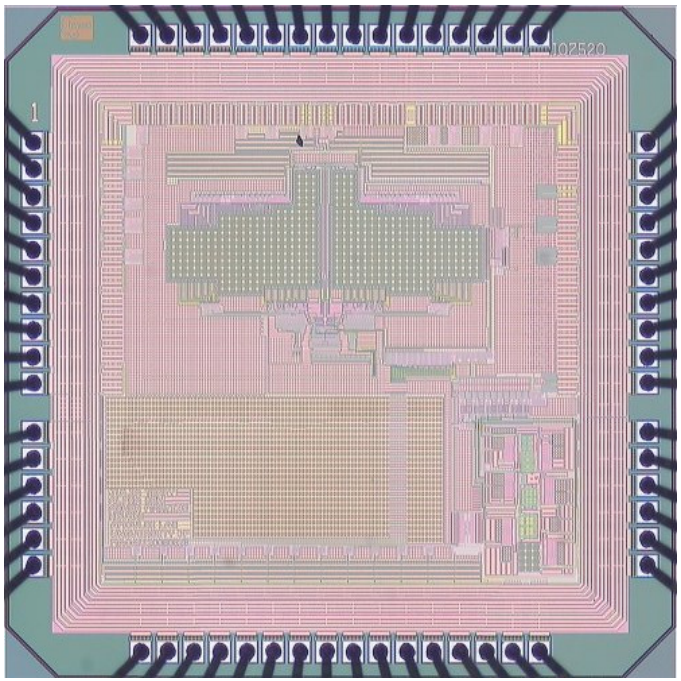
What's Mixed-signal IC?

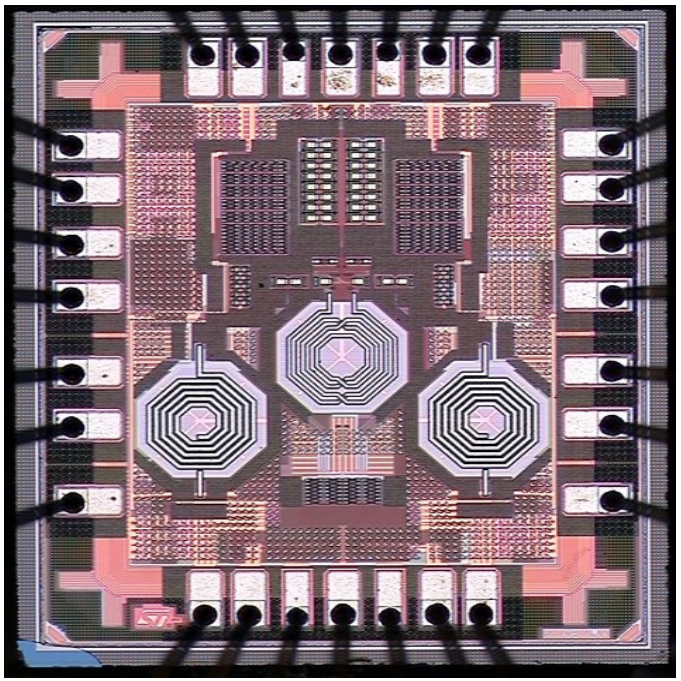
- ICs with analog + digital circuits on the same chip.



Examples of Mixed-signal IC?

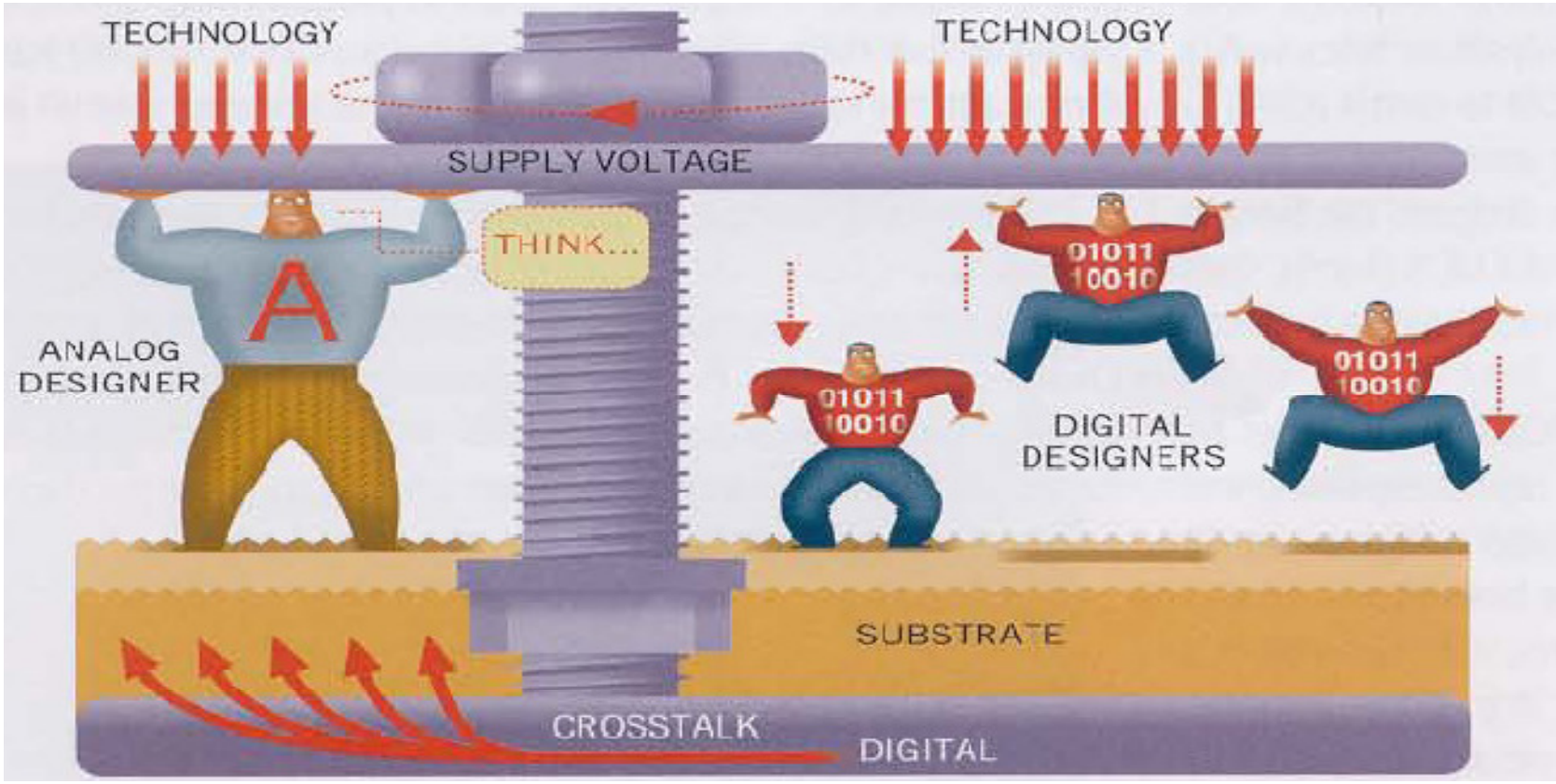
- Programmable amplifiers, filters
- Analog-to-digital converters (ADC)
- Digital-to-analog converters (DAC)
- Digital-controlled audio/video ICs
- Wireless communication ICs





Issues in mixed-signal IC design

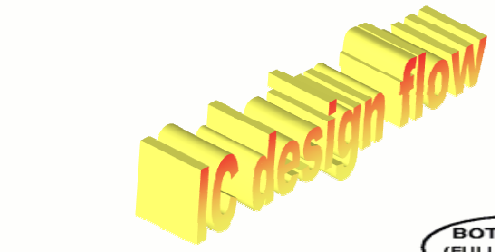
- Low power supply voltage + digital switching noise



Course content

- Introduction and course overview
- Review of MOSFET modeling and basic CMOS amplifiers
- Current and voltage references
- Output stages
- CMOS opamp design
- Advanced opamp design
- Filter circuits
- Sampling circuits
- Digital-to-analog converters
- Analog-to-digital converters
- Phase-locked loop circuits

IC design flow



SYSTEM IDEA

SYSTEM LEVEL VERIFICATION

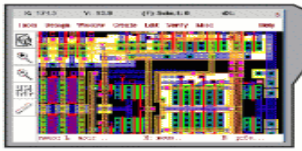
IDENTIFYING SUB-BLOCKS

BOTTOM-UP (FULL CUSTOM)

SUB-BLOCK SCHEMATIC

TRANSISTOR LEVEL SIMULATION

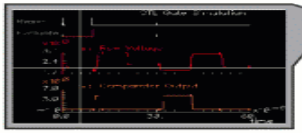
LAYOUT



EXTRACTION

LAYOUT vs SCHEMATIC CHECK (LVS)

POST-LAYOUT SIMULATION



TOP-DOWN (STANDARD CELL)

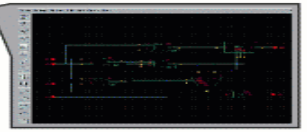
RTL CODE (HDL)

STRUCTURAL CODE (HDL)

TARGET LIBRARY

LOGIC SYNTHESIS &TARGET LIBRARY MAPPING

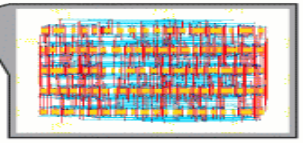
SCHEMATIC CAPTURE



GATE LEVEL NETLIST

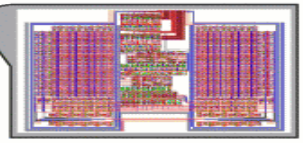
DIGITAL SIMULATION

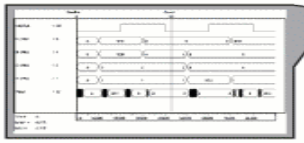
PLACEMENT&ROUTING (STANDARD CELLS)



POST-LAYOUT SIMULATION

PLACEMENT&ROUTING (TOP LEVEL)

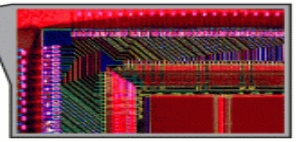




TOP LEVEL VERIFICATION

TAPE-OUT

PROTOTYPING



TEST

FABRICATION