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Why study analog electronic?

Kizito NKURIKIYEYEU, Ph.D.

Is analog electronics dead?

- Most electronic devices are digital nature.
- Traditional applications of analog electronics (e.g., filters) have been replaced by digital electronics
- Analog electronics is hard —as experience shows —why would anyone bother with it instead of using simpler digital electronics?
- Are the glory days of analog engineering over? How necessary is analog electronics in an increasingly digital world?¹
- Short answer: analog electronics is here to stay ².
- “Analog circuits are needed to interface with reality. reality is analog” —Greg Taylor³

¹ Believe it or not, this is an old argument going back to the 1960s. see for example Bill Schweber's 1969 [Bill Schweber's 1969 article](#) on the on the future of analog circuitry

² Read the article [“The Perennial role of Analog Electronics”](#) to understand the relevance of analog electronics in the modern world

³ see [Greg Taylor's presentation](#) on future of analog design and the challenges in nanometer CMOS

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Why analog electronics

- Digital electronics is an abstraction of analog electronics —e.g., building a NAND gate requires transistors
- The real world is analog⁴ —thus, digital electronics need an analog interface to the outside world
- Analog electronics is needed for signal acquisition, amplification, isolation, gain, and A/D and D/A functions
- Some tasks are still better handled through analog electronics
 - Switched-mode power supply⁵
 - Musical applications⁶
 - Radio frequencies (RF) and very high frequency signals
 - To transmit information over long distances, analog circuitry is needed to drive the communication channel⁷

Why analog electronics

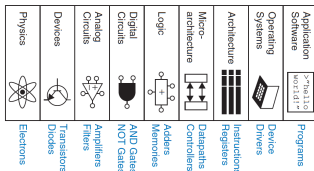


FIG 1. Levels of abstraction for an electronic computing system⁸

⁴ see prof. Peter Kinget on why/how [thworld is analog](#) and why that matters

⁵ https://en.wikipedia.org/wiki/Switched-mode_power_supply

⁶ <https://blogs.scientificamerican.com/observations/which-sounds-better-analog-or-digital-music/>

⁷ https://www.ee.columbia.edu/~kinget/WhyAnalog/circuitcellar_The_World_Is_Analog_201410.pdf

⁸ Harris, S. L., & Harris, D. (2021). Digital Design and Computer Architecture