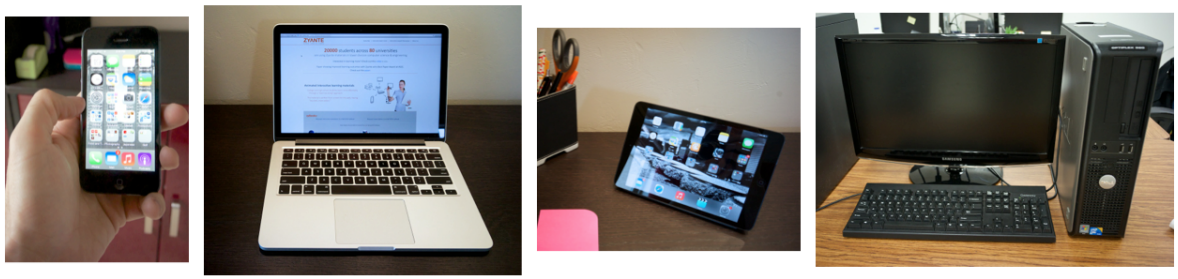
3.1 Why study digital design

Studying digital design gives professionals, like computer scientists, or electrical and computer engineers, a deeper unders computers work "under the hood." Even if going on to do others tasks, like writing software, assembling systems, etc., such can lead to more professional accomplishment of those tasks—akin to drivers knowing how a car engine works being bette drivers, or to a skin expert knowing how all the human body works being better dermatologists. And, some computing prof on to directly use digital design to build computers.

Figure 3.1.1: Digital design is needed to understand how computing systems work.



Source: Zyante

Studying digital design is also important for professionals who may build embedded systems, like computer scientists, elec computer engineers, mechanical engineers, biomedical engineers, physicists, and more. An ***embedded system*** is a comput embedded within another device like an automobile, an electronic book reader or music player, a robot, a medical device, a system, and much more. Hundreds of times more embedded systems exist than traditional computers. As digital circuit ch shrink, become more powerful, and reduce in cost, previously-unimaginable exciting embedded system inventions continue like eyeglasses that a user can talk to and get instant information displayed in the lenses, like self-driving cars, or like inges computerized pills that deliver time-released medicines or that measure internal body data—all of which exist today. To me constraints on size, performance, power, or cost, embedded systems often use various combinations of microprocessors a digital circuits.

Figure 3.1.2: Embedded systems: Smart pill, automobiles, and more!

Source: SmartPILL™ by Given Imaging

Source: Zyante

PARTICIPATION ACTIVITY 3.1.1: Why digital design.

Which of the following are likely to be true, based on the above discussion?

1) The VP of Engineering at a billion-dollar hard-drive maker complained that computer science graduates who "don't understand resources" end up writing grossly inefficient software.
   - ○ True
   - ○ False

2) Knowing what computer parts do, like memory or clock, can help in purchasing computers.
   - ○ True
   - ○ False

3) A computer software update involved updating the flash memory of a hardware component. The update failed. A phone technician said the component required replacement, but based on knowledge of how flash memory worked, the user suggested manually downloading the software, which worked.

- ○ True
- ○ False

4) The inventor of the most widely-used programming language (as of 2014) says that the trend of hiding under-the-hood details from computing graduates is "a disaster waiting to happen."

- ○ True
- ○ False

5) Each function of an embedded system is inherently either a microprocessor program or a custom digital circuit, but can't be both.

- ○ True
- ○ False

Provide feedback on this section