What’s New?
September 2023

Phones & Tablets

Apple iPhone

- Earlier today, Apple announced the latest version of its iPhone series, the iPhone 15.
  - Less square in shape, more rounded on the edges.
  - Periscope lens on the camera, providing 6X zoom rather than the current 3X zoom.
  - USB-C charging and data port instead of the Apple Lightning port. However, only the more expensive pro model supports USB 3.2 speeds (20GB/sec); other models are limited to USB 2.0 speeds (0.48GB/sec).
  - Faster, more capable processor chip: A17 Bionic.

Apple iOS

- iOS 17 is the latest iPhone OS and contains several new features, including:
  - Contact posters – Allows you to customize how your profile appears on other people’s iPhones.
  - Collaborative music playlists – multiple people can create, edit, and use a music playlist.
  - Improvements to autocorrect – using artificial intelligence (AI) and machine learning (ML).
  - Live voicemail – Provides a real-time transcription as someone leaves a voicemail for you, and lets you pick up the call at any time.
    - Calls identified as spam by your carrier will not appear as live voicemail.
  - Dynamic Island – The latest attempt by Apple to make the (selfie camera) notch on the iPhone display a little less intrusive. The notch area now doubles as an area to provide information.

Android Phones

- Since there are many manufacturers of Android phones, your best bet is to visit the manufacturer’s website to learn about new features being added.
Android OS

- Fall 2023 will see the release of Android 14.
  - The ability to upgrade your phone to a new version of Android is controlled by your phone’s manufacturer: some permit it earlier, while others defer it until later.
  - Android phone manufacturers also may customize the version of Android on your phone to exploit hardware features of those phones.
- New features of Android 14 include:
  - Notification flashes – camera flashes or screen flashes to quietly alert you to new notifications.
  - App cloning – If you and others share a single device to access certain apps (e.g., Facebook), you now can have multiple copies of the app, one connected to each of your accounts.
  - Predictive back gestures – These afford you a glimpse of the screen to which the back button will take you.

Tablets

- So, what’s new in tablet devices this year?
- For the most part, look at the changes in smartphones and you will see the same changes in tablets.
  - A tablet is (for the most part) a smartphone with a bigger display and without the ability to make cell phone calls.

eReaders

- An eReader is a tablet-type device traditionally dedicated to letting you read eBooks.
  - An example is the Amazon Kindle.
- eReaders usually have an eInk display that appears similar to actual paper (e.g., no glare, such as one gets on an Apple iPad).
- An advantage to an eInk display over an LCD or OLED display is that the eInk display uses power only when the image on the display changes, but not when the image remains static (i.e., unchanging).
- A disadvantage of the display is its slow refresh rate (i.e., the time to change the image on the display). This can range from 0.35 seconds to 1.5 seconds. This makes eInk displays impractical for displaying video.
• eReader manufacturers have been experimenting with two features, and these are becoming popular and more widely available:
  o The ability to take notes and mark up documents on the device using a stylus.
  o Color eInk displays rather than grayscale eInk displays.
• Incorporating one or both features adds significantly to the price of the eReader.
• Here is an example of an eReader that incorporates both a stylus and a color eInk display:


TV & Streaming

TV Picture Quality

• OLED (Organic Light-Emitting Diode) TVs still are the “gold standard”, with bright colors and true blacks.
• However, manufacturers continue to create new and improve existing technologies to approach the benefits of OLED.
  o Competitors include QD-OLED and micro-LED.
TV Resolution

- With the advent of 4K TV, manufacturers immediately began working on 8K TV.

- You now can choose from among several brands and models of 8K TVs that are available.
  - Unless your TV is the size of the wall (100+ inches), you probably will be unable to distinguish between 4K and 8K TVs.
  - You also will pay a premium for 8K TVs.
  - Currently, there is very little 8K content available.

Wireless TV

- Look for the proliferation of wireless TV soon.
- These are TVs in which the display and tuner components are separated from one another and communicate via Wi-Fi or Bluetooth.
  - The thin display can hang on the wall like a framed picture while the tuner sits on a nearby shelf or behind a couch.
- Another extension of this concept is to power the wireless display using batteries (probably rechargeable) so that the display has no wires running to it when in use.

Computers

Speed vs Efficiency

- Computer manufacturers are always on the lookout for ways to make computers run faster.
- However, there can be a tradeoff between speed and energy efficiency.
  - One can push a CPU to run faster, but it takes more energy to do so.
  - One can use less energy to run the CPU, and it will run slower.
Another way to make computers faster is to make the components smaller. For example, the up-and-coming chip technology uses data paths that are 3nm (nanometers) wide.

But we are approaching a physics-enforced wall regarding how small we can make components.

Still another way to avoid this tradeoff is to put multiple cores (i.e., multiple processing units) within a single CPU chip.

Some of the consumer-grade CPUs have as many as 32 cores.

Then, computer programs can be written to divide larger tasks into a group of simpler subtasks, assign each subtask to one or more of the cores, and then combine the results after the cores have completed their jobs.

Light vs Electrons

Most new CPU chips today follow the multiple-core approach.

However, some exciting progress has been made recently in using light paths to transfer data within the CPUs rather than using electron paths.

Expect light-powered CPUs to become available in consumer-level computers within the next year or two.

Solid-State Memory

We have discussed solid-state memory in earlier sessions.

SSDs (Solid-State Drives) have speed advantages over HDDs (spinning Hard Disc Drives), but SSD storage costs more than HDD storage.

If you have been looking to upgrade your computer drives to SSD or acquire an external SSD that plugs into a USB 3.x port, now may be the time: prices have been falling significantly.

Prices for solid state memory has reduced by 1/3 or more recently.

Artificial Intelligence

AI & ML

Artificial Intelligence (AI) & Machine Learning (ML) have been the topic of much discussion and debate over the past year or so.

ChatGPT and its cousins simultaneously have caused hope and panic.

Neural Processing Units (NPUs) are appearing more frequently in computers, TVs, phones, etc. to support the use of AI & ML.
• AI & ML provide a lot of benefits, including natural-language translation, autonomous vehicles, improved weather prediction, and the speedier search for new drugs.

• However, you probably have heard of some of the dangers of AI & ML, including plagiarism and academic dishonesty, more devious scams, and security issues.

Vehicle Technology

Autonomous Vehicles

• Autonomous vehicles (a.k.a. self-driving vehicles) continue to improve because of AI & ML.

• California recently passed a law that autonomous tractor-trailer trucks could begin operating on designated roads.
  o However, they also passed another law that such trucks also must have a human driver behind the wheel for the next five years.

• This second law was backed by the Teamsters Union. 😊

Electric Vehicles

• An advantage to electric vehicles (EVs) is that they have the potential to reduce our reliance on fossil fuels – someday.

• However, EVs have not turned out to be the panacea that the government claimed.

• Many of the problems are related to the current battery technology used in the vehicles.

EV Batteries

• Current batteries (lithium-ion) are heavy.

• The chemicals within them are somewhat toxic.

• Damaged batteries are prone to catch fire.

• They are expensive to produce and replace.

• They do not perform well in high temperatures (e.g., Texas summers).

• They do not perform well in low temperatures (e.g., Minnesota winters).
Battery Research

• Because of the potential of electric vehicles, a great deal of effort and expense is being put toward the development of better battery technology.

• Every few days/weeks/months, one hears news reports concerning battery technology breakthroughs that will “change the world”.
  o Remember that many corporate and university research labs employ full-time public relations people. 😊

• When (not if) a significant battery breakthrough truly is accomplished, it could change the face of all our electronics, not just our automobiles.