Member of apcug An International Association of Technology & Computer User Groups

Our Club

RCSI is a non-profit 501(c)(3) group open for membership to anyone interested in computers and related technology. Our aim is to provide an exchange of information between users of digital devices. We are not in any way affiliated with any computer manufacturer or software company.

Program Meetings

No admission fee for non-members. Everyone is welcome! Second Tuesday of every month, except August, from 6:30pm – 9:00pm.

Help's Half Hour (Q & A)
6:30pm – 7:00pm. Members and Guests are welcome to attend and bring their computer related questions with them to get answered.

7:00 – 7:15, Club Business

7:15 – 8:30+, Main Presentation
Come and join in the fun and enjoy a snack! You are welcome to bring a friend.

Become a Member

Go to our website, www.rcsi.org, and download a printed form for use by Post Office mail, enter your info online, or attend a meeting.

Monitor

The Monitor is published monthly by and for members of RCSI. Articles by RCSI members may be reprinted by other user groups or non-profits, without special permission, provided they are unaltered and the publication emails a copy to the author or Monitor.

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The Rochester Computer Society, Inc.

a computer/tech club open to everyone

MONITOR

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Tuesday, February 12, 'Cutting the Cord'
remote presentation by Hewie Poplock of the
Central Florida Computer Society /
Sarasota Technology Users Group

Tuesday, March 12, 'Home Automation'
remote presentation by Bill James of the
Computer Club of Oklahoma City
6:30 Help's Half Hour, 7:00 Business, 7:15 Main Presentation

In This Issue

A new year, a new format. This version of the newsletter is a combination of both, the web and booklet. Last month, my hard drive crashed and my backup computer developed a problem. I had trouble saving and reopening the newsletter. I was being locked out of my files, so I figured that my flash drive had a problem. I setup up a third computer, but the same issues developed. I even tried a computer, off site, but still could not safely reopen files and work on them. I did find a work-around solution, to get me by, for now. My laptops all run Linux, and I am beginning to think that LibreOffice might have installed an update that has caused some incompatibility issues. Hopefully, a solution will be found soon. The January issue is still in the works and will be available on our club website.

Americans' worst fear is…

By Andrew Malcolm

Not terrorism. Not nuclear war. Not Donald Trump. Not even mugging alone on a dark city street.

Americans' worst fear now is cybercrime, as in being the victim of.

Nearly three in four Americans cite that as their worst fear these days. Not too far behind is a cousin concern, identity theft.

A new Gallup poll finds that 71 percent "frequently or occasionally fear that computer hackers will access their personal, credit card or financial information."

Another 67 percent say they worry that often about identity theft, which leaves a trail of personal documentary wreckage that can take weeks or months to repair and recover. The identity fear is down slightly from the average of recent years. The cybercrime one is up slightly.

No wonder, actually given the numerous news stories about recent high-profile hackings — at Yahoo, Equifax, the Chinese hacking into federal computers to steal the complete personnel and background files on 21 million Americans, North Korean hackers silently shifting hundreds of millions of dollars from a Bangladesh government account, foreigner agents surveying online the inner workings of the U.S. power grid.

Psychologically, invisible fears — the ones you can't see that play off your vulnerable imagination — are usually the starkest, from monsters hiding in childhood shadows to radiation leaks to hungry sharks lurking beneath the water's surface.

Gallup has been surveying American fears for nearly two decades. When it added identity theft in 2010, that moved quickly to the top. And when it added cybercrimes last year, that instantly shot to the top concern.

The recent polls have found a dramatic shift in American fears from physical safety to cyber fears. Last year this Gallup Poll found, for instance, fear of walking alone at night fell to a 52-year low.

After the high online fears, the largest traditional crime fear is a home burglary in your absence (at 40 percent), having a car stolen or burglarized (37 percent), having a child harmed at school (32 percent) or being the victim of a mugging (25 percent) or terrorism (24 percent).

Being the victim of a hate crime, attacked while in your car or burglarized at home in your presence all come in at 22 percent.

Being sexually assaulted is 20 percent while fearing murder is only 17 percent.

The lowest fear reported by the 1,019 surveyed by phone was being killed or assaulted by a co-worker at seven percent, the same level as last year. Two crime fears — of terrorism and car theft — have recently fallen below the historical average.

Editor's note: I copied this article from the website, https://hotair.com, dated November 19, 2018.

AI, robotics, automation: The fourth industrial revolution is here

by Sue De Pasquale
Johns Hopkins University

For Chinese guests at Marriott International hotels, the check-in process will soon get easier. The hotel giant announced last summer that it's developing facial recognition systems that will allow guests to check in at a kiosk in less than a minute via a quick scan of their facial features.

Half a world away, fearful of what such technological advances will mean to their future job security, thousands of Marriott workers across the United States voted this fall to authorize their union to strike. In addition to calls for higher wages and better workplace safety, they pushed for procedures to protect them from the looming impact of technological advancement. "You are not going to stop technology. The question is whether workers will be partners in its deployment or bystanders that get run over by it," the union's president told *The New York Times*.

Indeed, what many are calling "the Fourth Industrial Revolution" is already here, disrupting jobs and labor markets, largely because of the rise and advance of artificial intelligence and robotics. Tinglong Dai, a Carey Business School associate professor in the research track with expertise in how AI interacts with operations management, is among those experts who are optimistic about the long-term impact on workers.

"In industries where demand for a product or service will grow in response to increased productivity, the rise of AI/robotics can turn out to be a boon for the job market, stimulating consumer demand and expanding market size," he says, pointing to the success of Uber and Lyft as one obvious example. "They've created a new and larger market for taxi-like services."

While Dai acknowledges that advancing technology has killed (and will continue to kill) some types of jobs, he notes that new industries and job functions will be created and will make up for the loss of existing professions. "Part of the promise of AI/robotics has always been to liberate human beings from the '3Ds'—dirty, difficult, and dangerous jobs—so that they can focus on creative, personal, and original activities," says Dai. "I don't necessarily see AI/robotics as substituting for human skills; I see more opportunities for them to complement our strengths."

Dismissing doomsayers, Dai says he believes that issues such as widening skill gaps are short-term problems that will be righted. "I am extremely optimistic about the future," he says. "I believe in the unstoppable human desire to create a better world."

The issue, by the numbers

For its 2018 "The Future of Jobs Report," the World Economic Forum surveyed 313 chief human resources officers of large employers operating in multiple locations, representing more than 15 million employees around the globe. Over the next several years, they found, companies expect a significant shift on the frontier between humans and machines when it comes to existing work tasks. Currently, companies estimate that 71 percent of the total task hours are performed by humans and 29 percent are performed by machines. By 2022, companies predicted that humans would complete only 58 percent of total task hours and machines would complete 42 percent.

This shift will be accompanied, business leaders predict, by a need to "re-skill" the workforce. A predicted 54 percent of today's employees will require significant re- and up-skilling by 2022.

The study also found:

- 35 percent of the workforce is expected to require additional training lasting up to six months
- 9 percent is expected to require additional training of six months to a year
- 10 percent will require training of more than a year
- Nearly 25 percent of companies are undecided about or unlikely to pursue the retraining of existing employees
- Nearly 66 percent of companies expect workers to adapt and pick up skills as they pursue new positions
- More than half of companies are likely to turn to external contractors, temporary staff, and freelancers to address their skills gaps

A global scorecard

In a 2017 analysis that covers 46 countries comprising almost 90 percent of global GDP, the McKinsey Global Institute found that China faces the largest number of workers needing to switch occupations—up to 100 million if automation is adopted rapidly, or 12 percent of the 2030 workforce.

For advanced economies, the share of the workforce that may need to learn new skills and work in new occupations is much higher, up to 33 percent of the 2030 workforce in the U.S. and Germany and nearly 50 percent in Japan. About 50 percent of the tasks that workers perform and are paid almost $15 trillion to do in the global economy could be automated through the adapting of current technology, the analysis found.

But degrees matter. More than half of the occupations requiring less than a high school diploma are susceptible to being replaced through technical automation, whereas only 22 percent of jobs that require a college degree are susceptible. The career fields most likely to increase in demand in the period of the 2022 are those based on and enhanced by technology, including:

- Data analysts and scientists
- Software and applications developers
- E-commerce and social media specialists

Also expected to increase are jobs related to understanding and leveraging emerging technologies, such as:

- AI and machine learning specialists
- Big data specialists
- Process automation experts
- Information security analysts
- User experience and human-machine interaction designers
- Robotics engineers
- Blockchain specialists

Dai says the changing landscape of the global economy will produce opportunities for those who know where to look.

"Online streaming has not killed movie theaters, because at a fundamental level people want to go out instead of staying at home," he says. "For the same reason, the hope and desire for newness and excitement will lead people to a new world in which they have fulfilling and interesting work and lives."

Editor's note: Read more at: https://phys.org/news/2018-12-ai-robotics-automation-fourth-industrial.html#jCp, dated December 28, 2018

Where's my flying car? 5 futuristic concepts drivers want most

Do you remember being a child, sitting in front of a glowing television? Eyes wide, legs crossed and a little bowl of marshmallow-filled breakfast cereal in front of you? The familiar theme song would play, color would fill the screen and there they'd be — that futuristic family in a flying cartoon car. It was an incredible sight, one that filled us with wonder and excitement, and the hope of having our very own airborne automobile by 2020.

Sixty-eight percent of Americans believed that dream would turn into reality, according to Hankook Tire's Gauge Index Survey. And while we wait for that innovation to come to mass-market fruition, the reality of putting your car on autopilot from A to B is right around the corner.

Here are five more futuristic expectations drivers have set as they look down the road:

1. Expectation: Tires that never go flat.
According to the Gauge, more than one third (35 percent) of Americans consider the run-flat tire to be the biggest tire technology achievement in recent history. Another 44 percent are looking to see self-repairing tires as an imminent innovation. The reality is, as automotive technology continues to drive forward, tire technology is rolling along right beside it. Tire manufacturers are looking to improve performance and sustainability through inventive designs like the Hankook Kinergy AS EV, engineered to accommodate the complexities of modern electric vehicles.

2. Expectation: A distraction-less drive.
There has been plenty of advancement in tools to downplay distracted driving — think Bluetooth, "Do Not Disturb" and similar functions for our mobile devices. It's too bad there hasn't been a way to keep our eyes off the other drivers. More than half (58 percent) say that other people's bad driving is their top distraction on the road. Autonomous technology such as lane keep assistance and automatic emergency braking help compensate for those distractions.

3. Expectation: Cars that can take care of themselves.
Nearly half of Americans (48 percent) would love to see their cars equipped with self-maintenance capabilities. In reality, today's maintenance technology is sophisticated and can predict things like how far you can go until your next oil change. And of course, there's an app for everything. Now just imagine … how easy would it be if your car couldn't just tell you it's time to take it in, but get the job done for you?

4. Expectation: Driverless vehicles for everyone.
Autonomous vehicle technology is certainly speeding forward, and there are some who argue it will help create a safer

drive down the road. The survey found that men are nearly twice as likely to opt for self-driving capabilities as women (40 percent versus 24 percent). Those who aren't looking for cars to drive themselves may like their vehicle to be smart in other ways — like when it comes to their coffee order. Millennials, for example, are significantly more interested in seeing cars be able to automatically order their morning coffee than other age groups (15 percent).

5. Expectation: Lots and lots of legroom.
As we look toward the future of car autonomy, it's clear that Americans would love to kick back and occupy themselves when driving is no longer a responsibility. According to the Gauge, would-be drivers would spend their commutes sightseeing (39 percent), taking a phone call (33 percent) or eating (28 percent). So while today's reality might not include a table in the car itself, futuristic concepts may include just that!

There's no telling how long it will take to get us to a flying future, or even a fully self-driving one. But there's also no denying that vehicle and tire technology has come a long way from the days of the horseless buggy and wooden tires, and we can expect some fascinating futuristic tech to come.

Editor's Note: I found this article on the housetopia website (www.housetopia.com), dated Friday, 28 December 2018.

* * * * * SOFTWARE & HARDWARE * * * * *

Ask Leo !
By Leo Notenboom, https://askleo.com/
Technology With Confidence
Making Technology Work For Everyone

This Is Why I Back Up

Here's another example of why going digital enables a level of backup safety that single originals simply can't achieve.

This is why I go digital at every opportunity.

For years, I've had a collection of 8mm and Super-8 movies stored in my basement. As technology has progressed and the projector deteriorated, I realized that the only way I would ever see them would be to get them converted to a digital format.

That involved shipping them across the country. If that makes you nervous, it absolutely should. It did me.

Summary

- I had multiple 8mm and Super-8 movies transferred to digital form.
- One package was lost on return.
- The transfer company kept a digital backup, which I was able to download instead.
- Digital forms are much easier to back up and keep safe.
- The "lost" originals were recovered, due to the kindness of a stranger.

Movie transfers: Cinepost
Because this was so important, I researched the most promising services for digital movie transfers. I settled on Cinepost.

I'm glad I did. Not only are the transfers of high quality, but they did a great job keeping me posted, responding to my requests, and just being there for me. That last item, and one more thing, are important for reasons that will become apparent below.

To be extra clear: I would happily use Cinepost again, and highly recommend them to anyone considering something similar.

Three waves
I ended up sending a selection of my movies in three waves, though it was originally intended to be only two.

First, I sent in three movies — two older 8mm films of me as a small child and one Super-8 — to test the process. You can see the results of the 8mm transfer on my personal blog post, Little Leo. These were the most important films to me to preserve in some fashion.

While it was a little risky to send these in as part of a "trial run", the results exceeded my expectations. The original films were returned, along with the digital copies on a USB hard drive.

Once I saw the results, I went all in, boxed up the remaining 26 reels (2,000 feet) of Super-8 film, and sent it off for conversion. This time, the hard disk was returned separately, so I could review the results before the originals made their way back to me, in case anything needed to be redone. The results were once again perfect.

Of course, as I was reviewing the results of the larger batch of movies, I discovered I'd overlooked four more. I sent those in and told the folks at Cinepost they could just send everything back once these final four had been converted.

That's when things got interesting.

Return shipment fail

While traveling, I received email notification from the shipping company that the package, which required a signature, had been delivered to my home. My wife hadn't signed for anything and knew nothing about it.

When I returned home, the package was nowhere to be seen.

At this point, I had the conversions of all but those last four films. They were lost, and since they'd been shipped back together, both their digital and original forms were lost.

Let me say that again: they were *lost*.

But then I remembered something the folks at Cinepost had mentioned.

Backups to the rescue

The digital conversions remain on their equipment for some period of time after being returned to the customer.

Put another way, *they kept a backup*. The movies were not "in only one place", they were in two: the lost package, and at least one machine across the country from me at Cinepost.

We made arrangements to begin transferring those files via the Internet. They were large, so they took some time to upload, *but they existed*.

These movies were films I didn't even realize existed. They were films of me and our first dog, a Newfoundland named Elsie, taken not long after my wife and I were married. As you can imagine, they were incredibly touching for me to see.

More backups

Now that the digital copies were once again in my control, they fell into my own backup strategy. In short, that means:

1. Copies on at least two machines here at home. (Actually, three copies on three drives across two machines.)
2. Copies uploaded off-site in the form of cloud storage. (I happen to use Amazon S3 for my cloud backups, since it's part of the Ask Leo! infrastructure.)

All of that happened automatically, of course, within a few days of the digital copies arriving here.

Even if I never got my originals back, I had the digital copies, and they were backed up.

This is why I love digital and backing up

That's worth repeating. Even if the originals were lost forever:

- I have the digital copies.
- I can, and do, back them up to my heart's content.

To be completely honest, I'm not sure if the originals will ever see the light of day again. There's no need.

But this is why I love digital information and digital conversion (or copying, if you like) of analog or pre-digital media: it opens so many possibilities. Not only can I share what I have (as in my post), but I can *back it up*. I'm no longer reliant on one and only one copy of the movies in a format that has a finite lifespan and can be difficult to access.

What do you have lying around?

What are you at risk of losing because you have only a single copy?

What are you at risk of never being able to access again because media standards continue to evolve? (Who has a 8mm

projector these days?)

What are you at risk of losing because it's the only copy, and the mere act of viewing it causes it to wear and quite possibly literally tear?

What else don't you have backed up?

It's worth considering.

Postscript: the kindness of strangers

I'd begun the lost-package tracking process with Cinepost and the delivery service to see if we could track down what happened to the originals.

Two days ago, there was a knock at my door. A stranger, holding a package.

Holding *the* package.

The package had inexplicably been delivered to an address three miles away. Coincidentally, this person had also been out of town, and his neighbor had taken delivery and signed for the package without looking at it closely. Once the package had been opened, of course, it was clear it had been misdelivered.

He took the time to deliver it to the correct address.

Sadly, being so surprised, I didn't think to get his name — but I'm very, very grateful.

* * * End of Article * * *

Tidbits of probably useless information

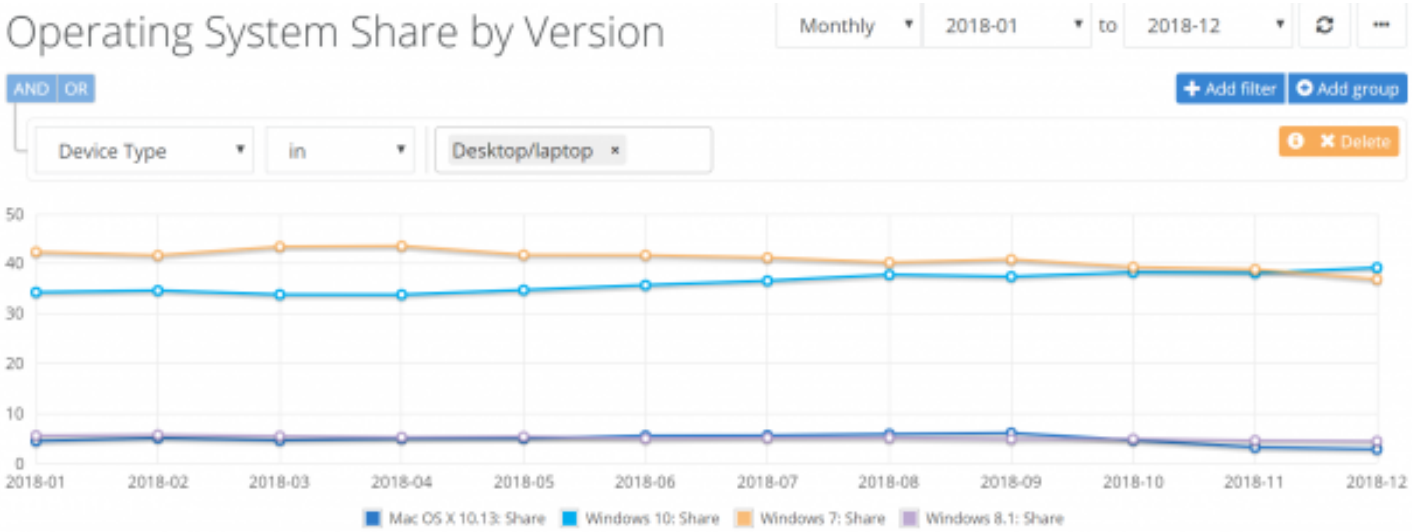
Honeybees have a type of hair on their eyes.
There are over 58 million dogs in the U.S.
Dogs and cats consume over $11 billion worth of pet food a year.
Fingernails grow nearly 4 times faster than toenails.
Humans blink over 10,000,000 times a year.
In the year 2000, Pope John Paul II was named an "Honorary Harlem Globetrotter."
Every second, Americans collectively eat one hundred pounds of chocolate.
There are approximately fifty Bibles sold each minute across the world.
A fetus develops fingerprints at eighteen weeks.
The fear of vegetables is called Lachanophobia.

Windows 10 Finally Pulls Ahead of Windows 7

By Joel Hruska

More than 3.5 years after launch, Windows 10 has finally pulled ahead of Windows 7 in terms of overall popularity. It's been something of a process for Microsoft to get here. While Windows 10 has been vastly more popular than Windows 8 and 8.1, the long tail now associated with the PC market and the slower pace of user upgrades have stretched out the amount of time it's taken for end-users to shift from one OS to the other.

This data comes from Net Market Share, which shows the two operating systems finally crossing over in December, with 39.22 percent market share for Windows 10 and 36.9 percent for Windows 7. At the beginning of the year, market share sat at 34.29 and 42.39 percent for Windows 10 and Windows 7, respectively. (We aren't displaying every tracked OS, so the totals do not add to 100 percent).



It's always interesting to compare the adoption rate on the Steam Hardware Survey against the adoption rate of the OS in the general population. Steam shows Windows 10 with 63.79 percent of the market, up 2.55 percent from the prior month. Windows 7 64-bit is said to have dropped 3.53 percent, with other OS's adjusting upwards and downwards slightly. Some of this may be an ongoing correction since it isn't clear why Windows 7 (32-bit) would see positive adoption figures this late in its life cycle, but the size of the gap between consumer and gamer adoption of Windows 10 shows that the two markets are on very different trajectories. Gamers, who still tend to upgrade more frequently than ordinary users, have adopted the newer operating system in much larger numbers.

It would be interesting to know more about what drove those adoptions. It's possible that games were more likely to adopt based on upgrade frequency or more likely to be exposed to Microsoft's repeated update offers. Windows 10 usage among both groups has continued to rise steadily even after the official end of Microsoft's free update period, but gamer adoption has remained well ahead of overall market penetration.

Windows 7 usage will likely drop throughout the coming year as the OS moves towards being phased out. Extended support and security patches end just over a year from now. Businesses and enterprises will have the option to pay for Extended Security Updates, but OS security updates for Windows 7 will cease for everyone else on January 14, 2020.

Windows 8.1 users have a little longer, until 2023. After that, Windows 10 will be the only supported operating system Microsoft manufactures — assuming, of course, that the company doesn't change its mind and release a Windows 11 at some point between now and then.

Editor's note: As reported on the web, www.extremetech.com, on January 2, 2019.

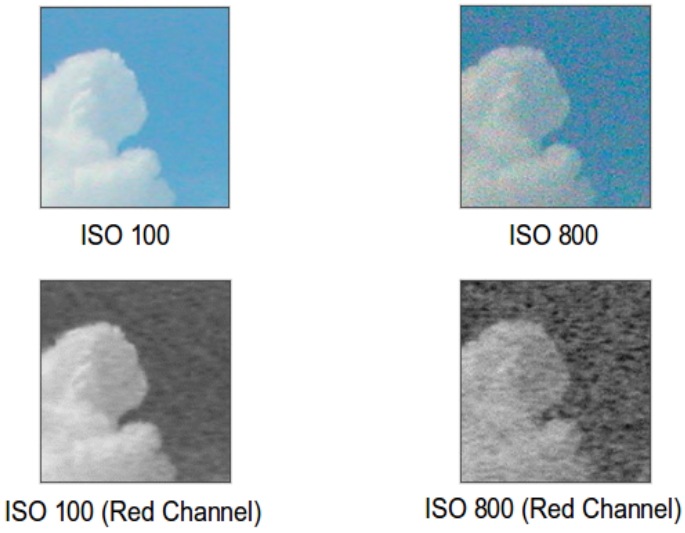
Digital Camera Control and Image Capture

By Dick Maybach
Brookdale Computer Users Group, NJ

My April 2018 article discussed what digital cameras do. Before I left the house, with a film camera, I selected the film, matching its sensitivity to the light levels I expected, and choosing either color or black-and-white. For each picture I had to gauge the brightness, either by guess (with black-and-white film) or with an external light meter (with color) to set the aperture and shutter speed. Then I would estimate the distance to the subject and adjust the focus. At last, I was ready to push the button. Now these adjustments are controlled by the camera's processor and made in a fraction of a second.

Sensor Sensitivity

Conventional film comes in different sensitivities for different purposes, with lower sensitivity providing finer grain but requiring more light. Likewise, digital cameras have an ISO rating indicating their level of sensitivity to light. Here too, lower ISO implies less noise but requires more light. The lowest ISO for most cameras is around 100 and can be increased in as high as several thousand, but very high ISOs often result in unacceptable noise; see Figure 1.



←--- Figure 1. ISO Value and Noise.

Auto-exposure

Auto exposure is the process the camera uses to set its aperture and shutter speed, and most cameras let you select the mode, Figure 2. Matrix looks at the brightness of the entire frame, or at least at samples scattered about it, and is usually the right choice. The algorithms can be quite complex, and some high-end digicams hold databases of thousands of patterns, which they compare to the current image before setting the exposure. In unusual situations, you may wish to limit the area considered, for example if only the subject is brightly lit. In extreme cases, the area considered can be as small as five per cent of the frame area. Using the latter two modes, requires more time and thought, and in my experience often results in a missed picture.

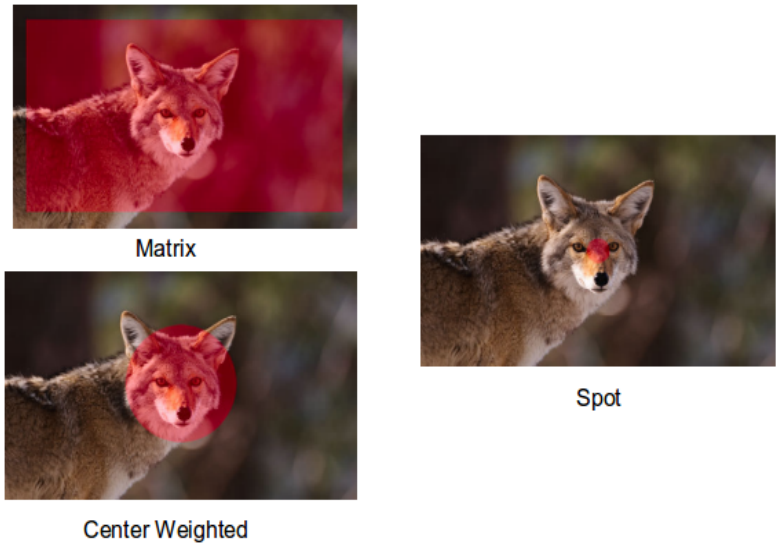


Figure 2. Auto exposure Modes. ---→

When using electronic flash, some cameras either measure the amount of light returned from the subject when the flash is on and turn off the flash when they judge the exposure is correct or measure the returned light during a brief pre-flash.

Auto focus

Two common methods of adjusting focus are contrast detection and phase detection. Contrast detection determines the distance to the subject by analyzing the image itself. The camera examines a small portion of the scene (shown by the red rectangles in Figure 3) and moves the lens elements,

searching for the best focus. The processor in the camera measures the differences in intensity among the adjacent pixels in the strip. If the scene is out of focus, adjacent pixels have very similar intensities. The microprocessor finds the point that produces the maximum intensity difference between adjacent pixels; that's the point of best focus. Look at the difference in the pixels in the two red boxes in Figure 3; The intensity differences in between adjacent pixels are greater in the focused image on the right.

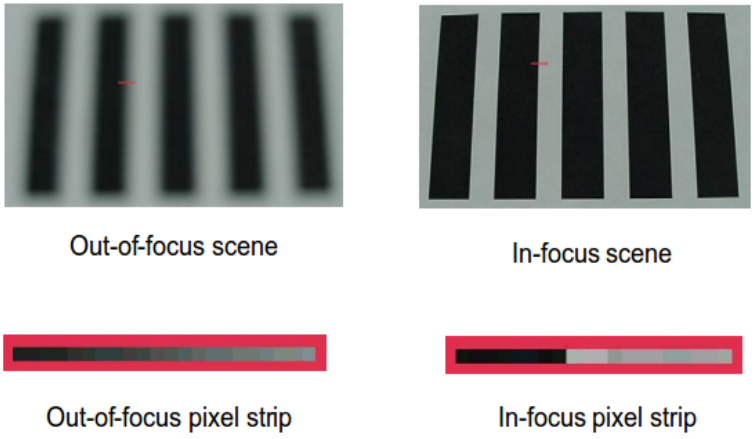


Figure 3. Contrast Detection Auto focus.

The image must have some detail and must be illuminated to provide the contrast that passive auto focus needs. If you try to take a picture of a blank wall or a large object of uniform color, the camera may not be able to find enough difference in adjacent pixels to adjust the focus. Although some systems react only to vertical or horizontal detail, newer designs use combinations of vertical and horizontal sensor strips.

This method is used on compact and mirrorless digital cameras. Early implementations were fairly slow, since the camera must search for the correct focus by moving the lens, but recent versions are much faster. Contrast detection requires no added hardware, since the input is from the existing photo-sensor (assuming of course that the sensor is not blocked by a shutter or mirror). Years ago, some cameras used active auto focus, which bounced sound from the subject and used transit time to judge distance. This worked well for subjects within 20 feet or so but required additional hardware. These techniques were more popular in film cameras; Polaroid in particular was fond of it.

Most single-lens reflex cameras use an auto focus method called phase detection, shown in Figure 4. (If you have an engineering background, be careful here; this method is not related to the one of the same name used in radio receivers.) There are two light paths, shown by the red and green lines. Using optics to separate the two, this system produces two images, one from the right and one from the left side of the lens. It then measures the distance between those two images and detects the defocus amount. As the subject moves closer or farther, the angles of these two beams change, causing the distance between the images to change. If the camera knows the lens characteristics, it can calculate exactly how far to move the lens to achieve correct focus from the separation of the images, making focusing extremely fast.

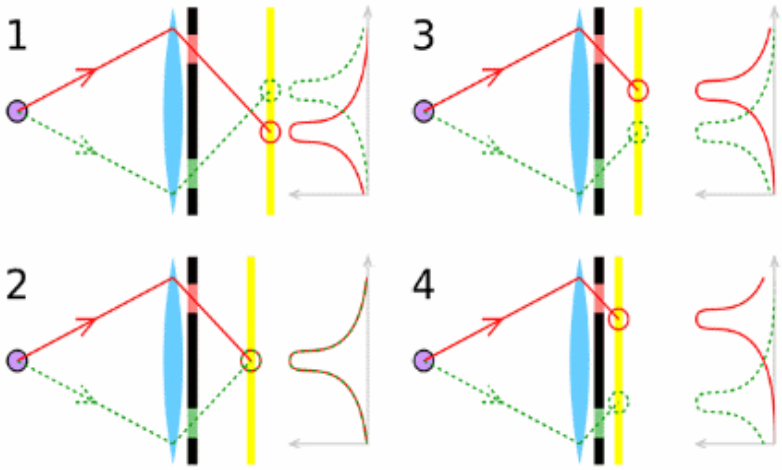


Figure 4. Phase Detection Auto focus.

This method judges distance the same way you do with your two eyes, but the separation in the camera is limited by the lens diameter. Hence, it's less effective with small lenses. Traditionally this method requires dedicated focus sensors. Initially, it was practical only for SLRs, but recently manufacturers have integrated phase detection into the main sensor, allowing its use in other architectures.

Figure 5 shows a traditional SLR phase detection sensor. It contains element pairs, some separated horizontally, some vertically, and some diagonally. There are optics between it and the lens so that each member of the pair sees the same portion of the image, but from a different position. Think of them as pairs of eyes, each looking at the same area. It's important to remember that you can't determine from its position on the sensor what portion of the image each pair sees. Here we see 10 pairs separated vertically, 10 diagonally, and 16 horizontally. Those separated horizontally look for vertical edges, and those separated vertically look for horizontal ones. We could use the sensor of Figure 5 to look for horizontal, vertical, or diagonal edges at 10 different areas in an image, and for vertical ones at an additional 6 areas.

Figure 5. Phase Detection Sensor.

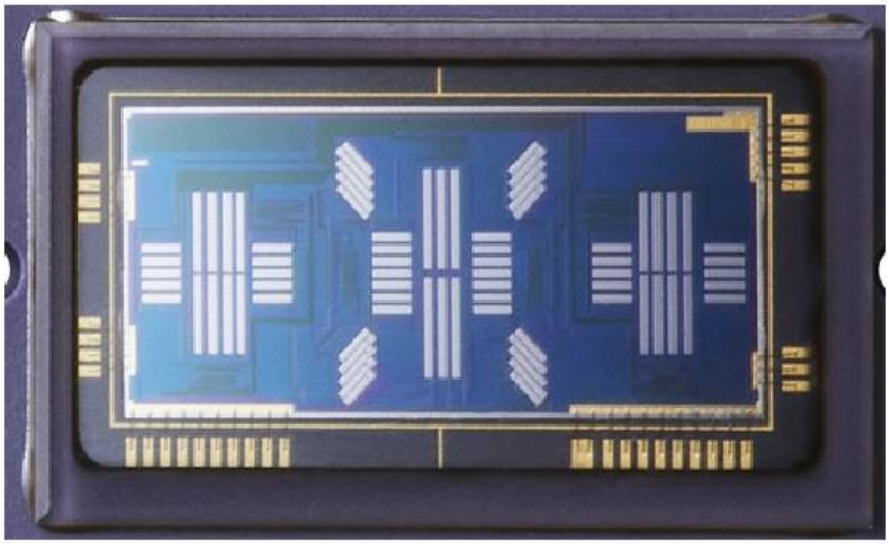
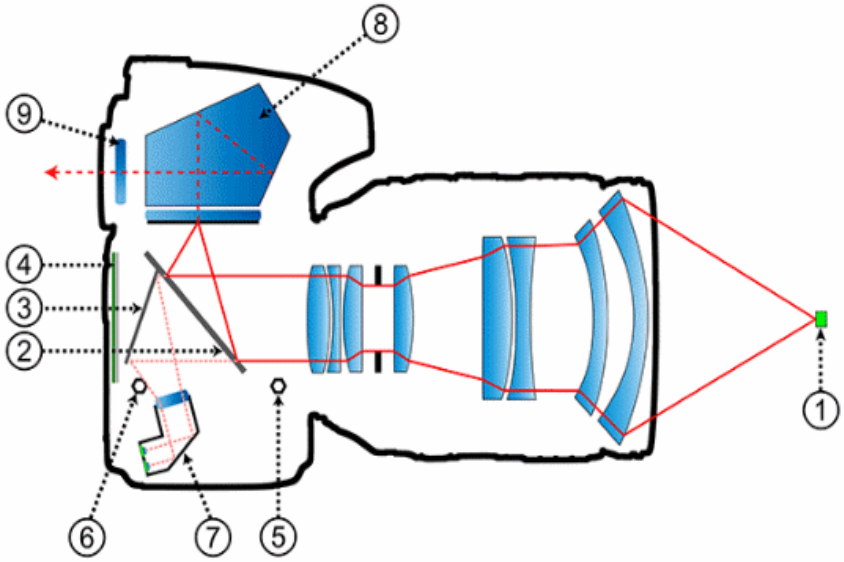


Figure 6 shows a complete phase detection auto focus system as implemented by an SLR.

3. 1 is the object and the red lines show the light from it.
4. 2 is the main SLR mirror, which is partially silvered to allow some light to pass through.
5. 3 is the secondary mirror, which directs light to the focus system.
6. 4 is the image sensor and shutter.
7. 5 and 6 are mirror adjustment points.
8. 7 is the phase detection sensor assembly, with the sensor itself at the bottom. The assembly contains masks and lenses to select and focus the light seen by each element of the sensor.
9. 8 is the pentaprism that orients the viewfinder image. Without this the image would be upside down or reversed left-to-right.
10. 9 is the viewfinder window.

Figure 6. Complete SLR Phase Detection Auto Focus System.



The details aren't important. What is important is the concept of comparing an image as seen from two separated points to judge its distance. In the graphic, the top light path views the object from the top of the lens, and the bottom path from its bottom. This doesn't show the exposure system, which could be located at the bottom or in the viewfinder.

Image Capture

Once the camera has completed its exposure and focus adjustments it is ready to capture an image, which it does using a format designed to make the sensor's job easier. Modern digital cameras contain more CPU power than desktop PCs of just a few years ago, and they have the power to convert these two forms that portray images correctly.

Digitizing

An Analog to Digital Converter (ADC) converts analog voltages to digital numbers. A one-bit ADC would classify the pixel values as either black (0) or white (1). A two-bit ADC would categorize them into four groups: black (00), white (11), and two gray levels in between (01 and 10). Most consumer digital cameras use 8-bit ADCs, allowing up to 256 distinct values for the brightness of a single pixel. Digital SLR cameras have sensors with a higher dynamic range and are usually equipped with 12-bit or higher ADCs. In each case, level 0 represents black, while the top (all ones) level represents white, and each intermediate level is a different shade of gray. These black, white, and gray brightness levels are all combined in what constitutes the gray-scale or brightness range of the image. A higher number of gray levels corresponds to greater bit depth and the ability to accurately represent a greater signal dynamic range, as shown in Figure 7.

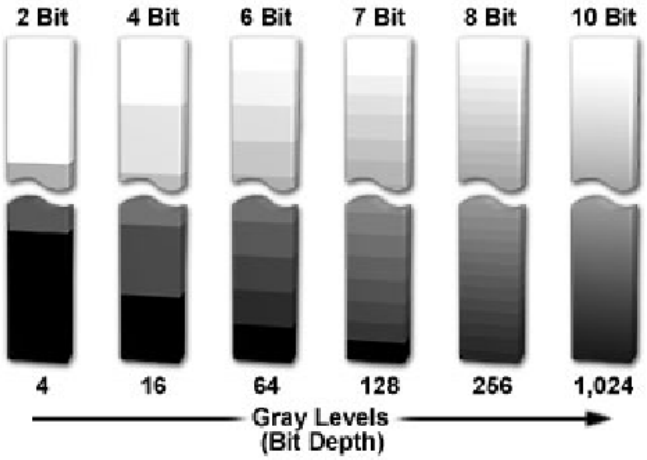


Figure 7. Bit Depth and Gray Levels in Digital Images.

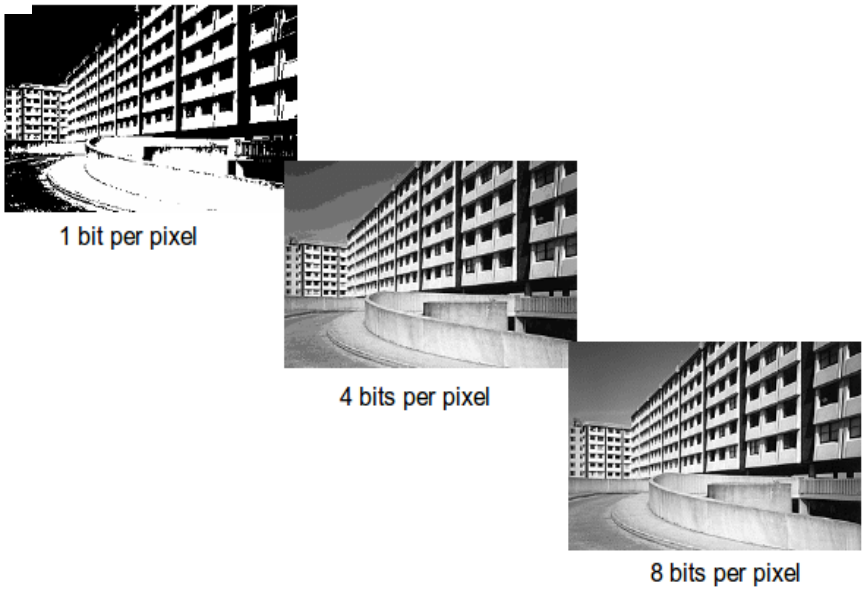
Figure 8 shows the same black and white image using three different bit depths. The first uses just one bit to describe each sample, so each pixel is either black or white. Four bits per sample in the second image provide sixteen different shades of gray. This does not give a high-quality image, note the banding in the sky area. The third image uses eight bits to describe each sample. This allows each sample to take one of 256 possible gray values.

Figure 8. Gray Levels.

—-But what about color? Recall from the March 2018 article that the sensor is covered by a Bayer filter, which means that some pixels see only green, some only red, and some only blue. As a result, the camera can estimate not only the light intensity, but also the color at each pixel by using information from adjacent ones.

The process we've discussed so far captures images that are properly focused and exposed, converts them to an array of digital numbers, and stores them. However, there is much to be done before they can be viewed, and I'll discuss that next time.

From the May 2018 issue, BCUG Bytes,
www.bcug.com, n2nd@att.net.



The year's worst computer passwords: "Donald" joins the list

One of the basics of computer security is to pick passwords that are tough for hackers to break, yet computer users continue to rely on easily guessed terms like "123456." One notable entrant joins this year's list of the worst offenders: "Donald."

The analysis of 5 million leaked passwords on the Internet from SplashData finds that computer users are still relying on unimaginative passwords that could allow a hacker to gain entry to their accounts. The most frequently used passwords that carry big security risks are "123456" and "password," which hold the No. 1 and No. 2 spots, respectively. What might be most disturbing is that these two "bad" passwords have retained the top spots for a fifth consecutive year in SplashData's annual analysis. That demonstrates many consumers aren't heeding warnings from security experts about beefing up their personal security, even as hacks become more widespread, such as last month's massive Marriott reservation system breach.

New on the list this year was "Donald," most likely a tribute to President Donald Trump. Consumers often borrow from famous people for their passwords, opening them up to fraud since hackers are well aware of this human foible.

"Sorry, Mr. President, but this is not fake news – using your name or any common name as a password is a dangerous decision," said Morgan Slain, CEO of SplashData, in a statement. "Hackers have great success using celebrity names, terms from pop culture and sports, and simple keyboard patterns to break into accounts online because they know so many people are using those easy-to-remember combinations."

The company said it releases its analysis of the "worst" passwords to spur consumers to change their passwords and beef up their security.

"It's a real head-scratcher that with all the risks known, and with so many highly publicized hacks such as Marriott and the National Republican Congressional Committee, that people continue putting themselves at such risk year after year," Slain said.

* * * continued at bottom of next page * * *

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Planning Meeting

Held on 1st Tuesday of each month at 7 pm, at St. John's Meadows, Briarwood building.

Newsletter Printing

The newsletter was printed at St John's/Chestnut Court by the printing group, with the help of Don Wilder (computer and printer operator). *We will try and print on the 1st or 2nd* ***Thursday morning****, following the monthly meeting.*

Special Interest Group

Linux Sig

The workshop is the **third Saturday of each month**, at Interlock Rochester, 1115 East Main St. www.interlockroc.org
Enter through door #7 on the end of building, near *Comics Etc* and Goodman St. Find 'Interlock' on the intercom directory to get buzzed in and go upstairs to suite #200. We have experts on hand to fix problems and answer questions about Linux and FOSS (free and open source software). Bring your system in so we can help you get the most out of it. Hope to see you there.

Special Request

This is your newsletter. Are there articles that you would like to see more of **or** possibly less of? Is there a topic of interest that you would like me to research and put into print. In other words, is this newsletter benefiting you?
tonydel@techie.com

Computer Recycling

Some Residential Drop off Locations: **Call first**, to find out what is accepted, especially for 'tube type' tvs or monitors.

Sunnking (we rule electronics recycling), 585-637-8365, 4 Owens Road, Brockport, **some other drop off locations:**

Mirecycle, 49 Stone Street, Rochester, 585-224-4040
Goodwill Industries of the Fingerlakes;
Rochester – 451 South Clinton Ave
1518 West Ridge Road
376 Jefferson Road
885 Long Pond Road
Webster – 1217 Bay Road
50 Webster Commons Blvd
Fairport – 1200 Fairport Road
7450 Pittsford-Palmyra Road
Victor – 2 Commerce Drive
Honeoye Falls – 201 West Main St
Macedon – 1635 North Wilson Rd
Brockport – 1807 Nathaniel Poole Trail

The worst 25 passwords

Including their change in rank from the previous year: **1**. 123456 — Unchanged; **2**. password — Unchanged; **3**. 123456789 — Up 3; **4**. 12345678 — Down 1; **5**. 12345 — Unchanged; **6**. 111111 — New; **7**. 1234567 — Up 1; **8**. sunshine — New; **9**. qwerty — Down 5; **10**. iloveyou — Unchanged; **11**. princess — New; **12**. admin — Down 1; **13**. welcome — Down 1; **14**. 666666 — New; **15**. abc123 — Unchanged; **16**. football — Down 7; **17**. 123123 — Unchanged; **18**. monkey — Down 5; **19**. 654321 — New; **20**. !@#$%^&* — New; **21**. charlie — New; **22**. aa123456 — New; **23**. donald — New; **24**. password1 — New; **25**. qwerty123 — New

As reported on the www.winknews.com website, on December 15, 2018.

Our Meeting Place

St John's Meadows at Johnsarbor Drive, is on the left, past Clinton Avenue, when going West on Elmwood Ave. The opening in the white fence is Johnsarbor Drive. At the 'T', turn right. The meeting is in the first building on the left – **Briarwood**.

6:30 Help's Half Hour
7:00 Business
7:15 Main Presentation
Our meetings end between 8:30 and 9:00 pm.

Our meeting place can change. Please check our website before each meeting. **www.rcsi.org**

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MONITOR

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Tuesday, February 12, 'Cutting the Cord'
remote presentation by Hewie Poplock of the
Central Florida Computer Society /
Sarasota Technology Users Group

Tuesday, March 12, 'Home Automation'
remote presentation by Bill James of the
Computer Club of Oklahoma City

6:30 Help's Half Hour, 7:00 Business, 7:15 Main Presentation

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