



AITS Newsletter

AUGUST 2019

Random Musings on IT [Abraham John, Executive Director, AITS]

The articles I write for the newsletter are intended, for the most part, to be light with maybe just a smidge of some thought provoking statements. The article in this issue is no exception. There are no tech heavy thoughts here.

One of my managers afforded me the opportunity to watch just a bit of the Apollo 11 launch footage released on Blu-Ray recently. A truly historic event that speaks to the explorer and adventurer in each of us, it was also a testament to roles, boundaries, accountability and good organizational structure.

During the launch, each team fulfilled its role as it passed the baton on the team that was responsible for the next phase of the mission. We in IT would benefit tremendously from the lessons on roles, boundaries, accountability, and organizational structure from these pioneers of space flight. Good organizational structure leads naturally to order, people knowing their respective roles, their areas of accountability and fosters trust in areas of collaboration. Conversely, in an organization that has unchecked elements within it who break hierarchies or who step outside their roles and boundaries you will find people not knowing how their respective roles might be affected, lack of trust, lack of accountability and all collaboration degenerating to nothing but negotiations that take place in the proverbial non-man's land – basically chaos.

Watching that launch team in operation was a thing of beauty. No team or team member shirked their duty and not one tried to be more than the role that was theirs during the launch. That started me along a line of thought that, frankly, I have been contemplating for quite a while regarding my discipline and profession.

My profession and discipline is Information Technology (IT), computers, you know those things that are so useful but also have the capacity to drive the best of us to the mindset of a berserker☺. How about the people who work in this discipline and profession? How are they perceived? The benefit of having been in the discipline and profession for decades is that I have seen at times a field that no organization can survive without, reduced to operational only levels, having no place at strategic discussions and its usefulness commented on by people with no theoretical or operational knowledge in the field. This may seem to be an elitist statement. Rest assured it is not and neither is the intent. For example, any elementary school student can do basic sums, keep up with their weekly allowance if they receive any, and conduct playground negotiations. That does not make them a mathematician or accountant or businessperson who sees numbers and discussions in the correct context, understands markets, consumer needs, and strives to make the product of their profession useful for the purpose at hand.

How did we get to the point where IT is perceived to be organizationally confusing? I believe a significant portion of the blame rests with IT professionals and the rest can be apportioned between business elements, administration of any organization and organizational structures.

As IT professionals, we should understand our role within the organization and execute that role in pursuit of the organizational goal. This should be done within boundaries and hierarchies that are set within any organization. The behavior of IT



Established in 1890, UNT's humble beginnings can be traced to a rented space above a hardware store in downtown Denton. The school was established with only 70 students and we were known as the Texas Normal College and Teacher Training Institute.

not adhering to their respective roles and boundaries is typically found with rogue elements within an organization. As an organization we should be watchful of this type of behavior because it leads not only to confusion within the IT ranks, it also leaves people outside IT confused as to who does what. The view from the outside in these situations would naturally be one of confusion and professional and organizational immaturity. These situations can arise due to structural problems within an organization or the inability of the organization to deal with rogue elements or a hierarchal structure that does not hold rogue elements accountable. As IT professionals, we should work toward ensuring that our profession follows certain professional niceties and ethics. Peer networks should hold the rogue elements accountable. Organizationally it is necessary for the hierarchy to ensure that official channels act in lock step with peer networks to enforce appropriate organizational behavior.

The business of an organization is necessarily that organization's IT's business. It is the height of silliness to think that the IT professionals of an organization are not committed to organizational goals. We exist within an organization to bring to reality the vision and strategy expressed by the business, functional areas, and organizational leaders. I know that within UNT this is and continues to be the way IT professionals behave and work. Speaking authoritatively about AITS, my team, the furthering of our University's goals is part of our DNA and no, IT is never done just for the sake of IT. IT is always done to meet the initiatives of our divisions and departments.

As IT professionals, we are problem solvers. This is a natural trait shared by all dedicated IT professionals. We should also become educators. We should not be shy about telling the story of our accomplishments. What we do matters and we should not be shy about sharing the effort and work it takes to bring to reality ideas. As a profession, we should reinforce the roles and boundaries when it might be violated by non-IT or peers.

The problem for the IT profession that is posed from elements outside IT is one of education as well. Where education fails, the organization should ensure that organizational hierarchy, roles, and boundaries are followed.

While it is beautiful to imagine an environment that functions as wonderfully as the Apollo 11 launch teams, the reality is that we did not get to this point overnight and it will take concerted effort and hard work on IT's part to educate, inform, re-establish proper hierarchy and get the right IT voices at strategic levels. I for one will redouble my efforts to educate my divisions and departments about what we do and when necessary, highlight the roles we fill and the boundaries that fall within my team's scope of responsibility and accountability.



UNT's Chilton
Hall used to
house World War
II soldiers.

Have a wonderful start to the new academic year!

Time to Unplug [Christopher Horiates]

Recently I had to take a step back into my childhood. My mom wanted to clear the attic of my brother's and mine toys from our childhood. It was quite a task and sadly most of them were ruined by years of Texas heat. Some still worked and others, well just fun to see them one last time. It's amazing how simple toys were back then, and some of the more technologically advanced ones, well looking at them with today's standards they are ancient. Going through the boxes brought back a rush of memories. As I had a few days to digest it I started thinking back why that time was so special and what about it made it truly that last point in time where the world seemed different. Sure we all may look back and think how things were better than they are now. Truth is the world is a better place now than at any point in history. We are living longer, cars are safer, and we have lifesaving medical services, more people than ever have clean drinking water..... I could list all of the reasons why being alive today is better now but perception wise why did the past seem to be unique?



Enjoy this
brain teaser ©

A snail is climbing out of a well. The well is 32 feet deep. Each day the snail climbs up 3 feet and each night the poor fella slips back 2 feet. How many days will it take for our intrepid snail to get out of the well?

If you think back to the late 80's and early 90's, if you are old enough to remember, things were simpler and got very complicated and connected after that. We had antenna TV, no cell phones, no internet, on a road trip you had a fold out map, gas station clerks were your source for directions if you were lost, news was at 5PM or 6 PM, Monday Night Football was on ABC, Saturday Morning Cartoons were the reason to get up early, your newspaper was in print and left on your lawn..... Basically, we were less connected and had far less to fill our free time with so we spent it on things that were important to us.

The world became much smaller and more connected once the internet came about. We hear about stories that we would not have or read about something we never thought could or would happen. We have instant access to movies from multiple sources, music lists to fill our phones, GPS so we never get lost and know how long until we get there (and we still run late) and cars that self-drive because everyone is on their phones and not paying attention.

Being a new parent, with a now 4 and almost 2 year old, I see how simple life could be and wonder why we try to complicate it with all of our technology. Most of the time they want to play with cars, build with blocks, build a fort, but given a TV remote or phone they would like to use those too. Of late we have started to dial back the technology and focus more on family time and tangible play. I can't tell you how many parents I see at parks on their phones not paying attention to their young children or interacting with them. Sadly now if we even take the time to look up at the stars we use an app on our phone to tell us what's up there. When's the last time you took a real telescope out and looked up? It's crazy to think that 50 years ago we landed on the moon and from a recent poll I heard, Astronaut was bottom of the list of what kids want to be when they grow up. Instead it was YouTube Star or Vlogger.

Point is while technology can better our lives it should not consume our lives. Human interaction is still needed and family time or friend time off of and away from technology is important. Life happens and the best movie is not on Netflix or Hulu, instead it's the one you live every day. Your true friends are not the hundreds you have on Facebook or follow you on Twitter, but the ones who will be there for you in your worst times in person. Text messages are not how you should contact people, call them, drop in on your family and spend time in person. Mail a letter in the mail, send a postcard while on a trip.

Since we seem to live in the viral challenge world try this challenge. Go without your phone for maybe just one day and see how it goes. From there maybe try a few more days at a time. Take a walk and leave your phone at home or when at dinner with family or friends turn it off. Unplug from technology and plug into life.

EIS Fluid User Interface Is Almost Here For Campus Solutions

[Dorothy Flores]

Campus Solutions is becoming “Fluid.” So, what does this mean? It means that the EIS student information system (my.unt.edu) is getting a face-lift for student and faculty self-service. Over the past few years, Oracle has been periodically rolling out new functionality for each of the PeopleSoft applications that is designed to improve the user experience, called Fluid User Interface. If you aren’t already aware from past articles and other communications on campus, the rollout of Fluid for Campus Solutions is scheduled for the weekend of September 21.

What Fluid will provide is a more modern looking way for users to access self-service functionality using tiles, much like a mobile app, as well as streamlined menu options and navigation. It also provides a more mobile-friendly interface for users, because it is designed to be “responsive,” meaning that it will adjust its presentation to any device whether it is a PC, laptop, tablet, or phone.

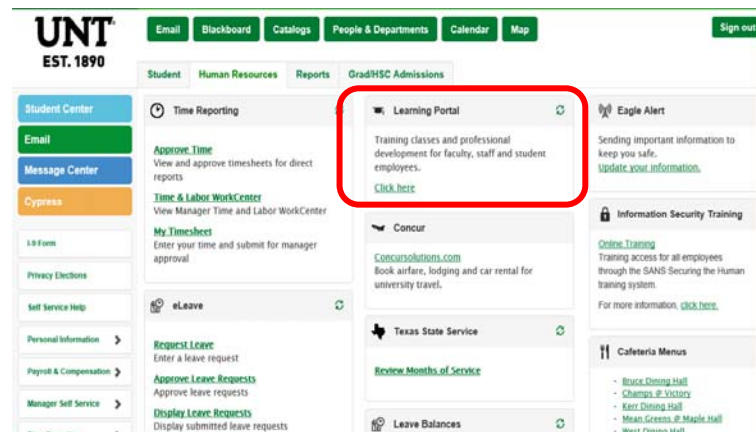
Following the successful completion of the Campus Solutions upgrade this past November, both functional staff at all three campuses and technical staff in ITSS have been focused on Fluid. Their work has included designing the home pages for students and faculty, applying appropriate branding for each campus, modifying customizations and bolt-ons (functionality enhancements) so they will work in Fluid, as well as performing extensive testing to ensure a smooth transition to the new look-and-feel for users. Additionally, a communication plan for each campus is in-progress leading up to the go-live in September to ensure the user community is fully informed of the changes before the rollout occurs.

Although the new Campus Solutions with Fluid won’t be available for a couple of months, an EIS Fluid application is already in use across the UNT World for employees with the Enterprise Learning Management (ELM) application. It can be accessed through my.unt.edu by going to the Human Resources tab, then clicking on the link in the Learning Portal box (screenshot below). It is definitely a new “look and feel” for EIS with the simplified, less cluttered presentation and user experience.

As for HR/Payroll and Finance moving to Fluid, plans are currently in the works to determine the best timeframe for those rollouts in the future. Once decisions have been made, there will be communications within UNT World to ensure everyone is aware of those up-coming events.

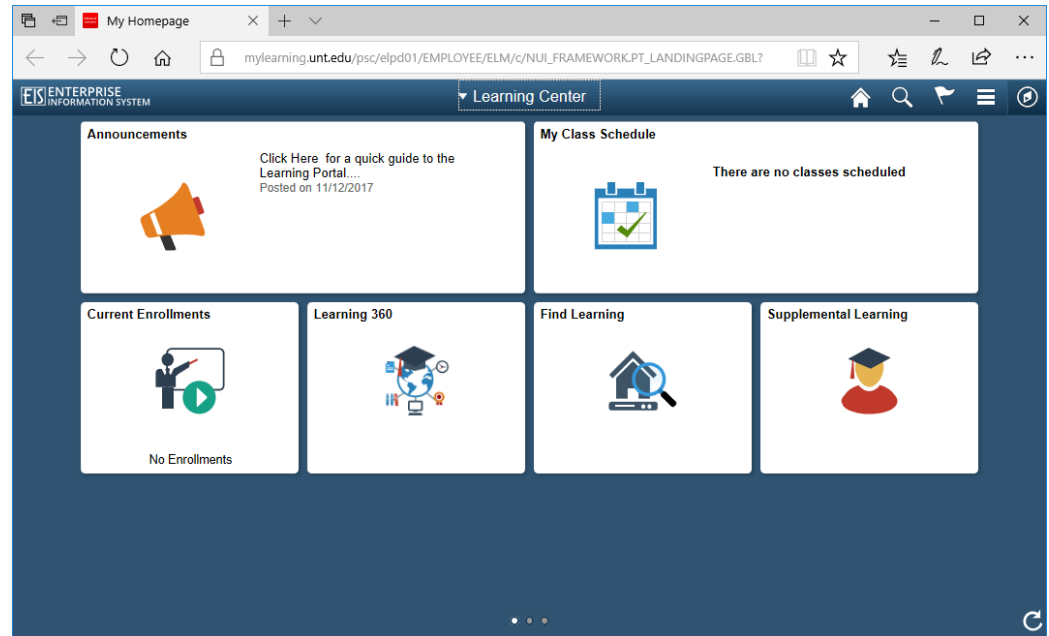
It has been quite a number of years since Oracle has delivered such a significant transformation in their technology and with their commitment to supporting PeopleSoft at a minimum through 2030, users can expect to see continued improvements over time. Fluid is certainly a welcome modernization of the user experience for EIS.

My.unt.edu:



Wooten Hall, designed and built during the Vietnam War, was designed with riot prevention in mind.

Fluid in the Enterprise Learning Management application:



There were 15 Apollo launches and they carried 45 occupants into orbit.

EIS Fun Facts

- **EIS currently shows 14,383** UNT World employees with a combined total of **69,557** years of state service, including other State institutions where they may have worked.
- The average years of service **calculated from** EIS for all UNT World employees is currently **4.92** years.
- In the past **12** months, UNT processed almost **12,000** meningitis documents, which is required by the State for all students under the age of **22**, in order to attend an institution of

higher education.

- For fiscal year **2019** YTD, EIS has processed **20,475** purchase orders in Purchasing and **108,291** payments out of Accounts Payable, including Student Refunds and Payroll vendors.
 - The EIS Security Team has processed **142** Incidents and **620** Service Requests for fiscal year **2019** YTD.
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There were
10 Gemini
launches and 20
occupants were
launched to orbit.

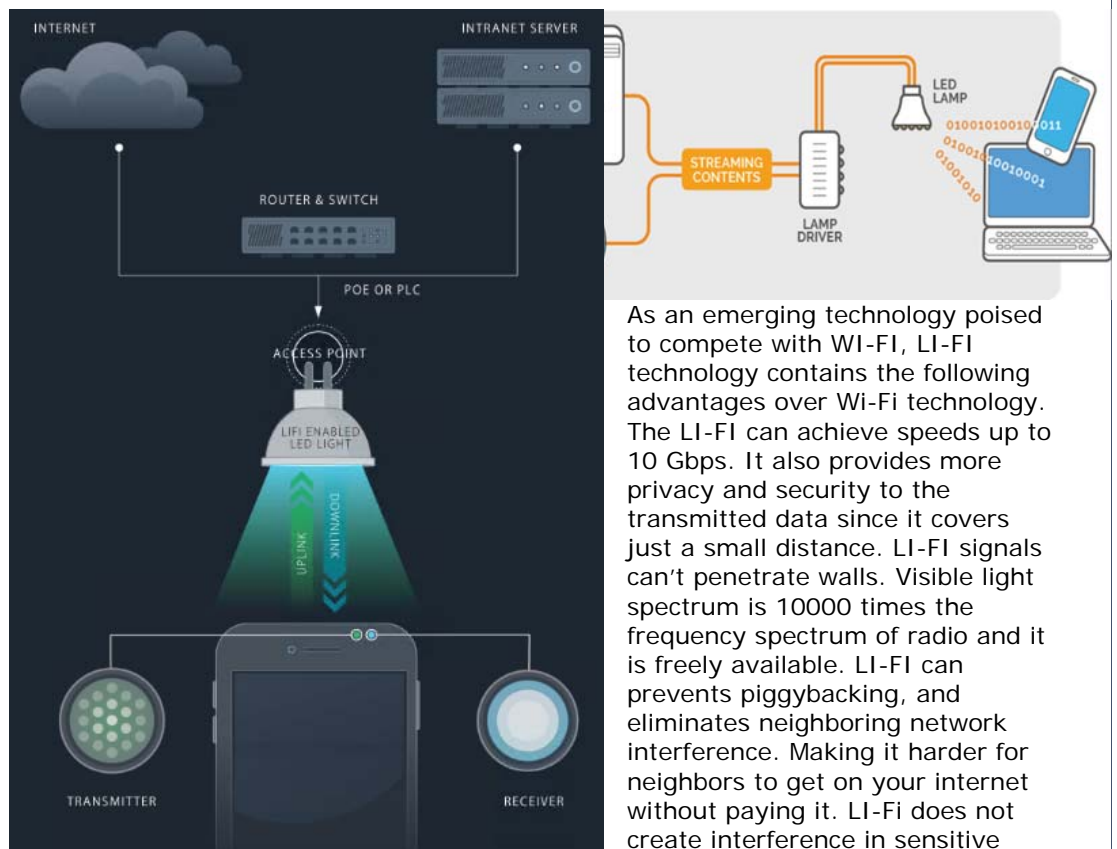
Li-Fi [Alexandra Martinez]

Wireless communication has become a high demand over the years and the wireless communication industry is trying to improve it. With so many possibilities one man by the name of Harald Haas, from the University of Edinburgh, UK figured out how to use light to send data. It is called LI-FI, also known as "Light Fidelity". It is a similar concept to WI-FI except the transmission of data is through LED light bulbs. LI-FI began during the 1990's in countries like Germany, Korea, and Japan where they discovered LED's can be used to send information. In 2007, Harald's research assistant was the first to send data using light signals. By October 2011, several companies and industries formed the LI-FI Consortium, to promote high-speed optical wireless system. By using LED lights, wireless system are being enhanced while also providing light.

You're probably wondering how LI-FI works. It's really simple there are two basic parts to LI-FI, a LED light source and a photodetector (phone's camera). The LED light source is the transmit module, while the photodetector is the receiver. A photodetector is connected to a computer or any other internet enabled device. To transmit data, the creator of LI-FI developed a technique called Spatial Modulation-Orthogonal, also known as frequency division multiplexing or SM-OFDM. The technique that Haas created is what makes LI-FI possible for a light source to transmit data and in an efficient manner. With the current being supplied by the LED bulb it can be modulated by a microchip that is placed in the bulb fixture. The modulation consisted of pulsing the bulb at high speed. The pulsing is fast enough where it cannot be detected to a human eye. The pulsing of the bulb is what transmits data. The data that is transmitted from the light bulbs then is picked up by the photodetector and is decoded back to binary code.



There were 4 Mercury launches and 4 occupants were launched to orbit.



As an emerging technology poised to compete with WI-FI, LI-FI technology contains the following advantages over Wi-Fi technology. The LI-FI can achieve speeds up to 10 Gbps. It also provides more privacy and security to the transmitted data since it covers just a small distance. LI-FI signals can't penetrate walls. Visible light spectrum is 10000 times the frequency spectrum of radio and it is freely available. LI-FI can prevent piggybacking, and eliminates neighboring network interference. Making it harder for neighbors to get on your internet without paying it. LI-Fi does not create interference in sensitive electronics, making it better for use

in environments like hospitals and aircraft. Along with advantages also come challenges with LI-FI. Since LI-FI uses visible light to transmit signals wirelessly, we need to keep the lights in 'ON' state 24/7 for continuous connection even during the night. If all power to a light is turned off then there is no LI-FI. However, LI-FI technology can be enabled to dim low enough that a room will appear dark and still transmit data. There is consistent performance between 10 and 90 percent

illumination. The power consumed is comparable with the watts/bit for radio transmission and so on aggregate even in domestic environments there is a significant net saving in power. If the apparatus is set up outdoors, it would need to deal with changing weather conditions and the sunlight. Light waves can easily be blocked and cannot penetrate thick walls like the radio waves can. The excessive light pollution is another challenge we face with LI-FI. There is still a scope for further development and efficient use of LI-FI.

Even though LI-FI has some limitations in its application, it has already been implemented in some office spaces. Making LI-FI available in the form of consumer products in the market. There has also been a significant increasing research in LI-FI networking techniques over the years. Therefore, LI-FI has become a reality and this technology is here to stay for a long time.



There were 6
Vostok launches
and launched 6
occupants to
orbit.

How Freevalve is Reinventing the Internal Combustion Engine

[Patrick Kennedy]

As we continually march towards mass electrification of vehicles, it's easy to assume that the internal combustion engine is not long for this world. However, thanks to innovations from the brilliant engineers at Swedish supercar manufacturer Koenigsegg and their sister company Freevalve, ICE engines are seeing a new chance at life outside of hybridization.

In a typical internal combustion engine (see figure 1), the intake and exhaust valves are opened and closed by a rotating camshaft that uses teardrop shaped lobes. The

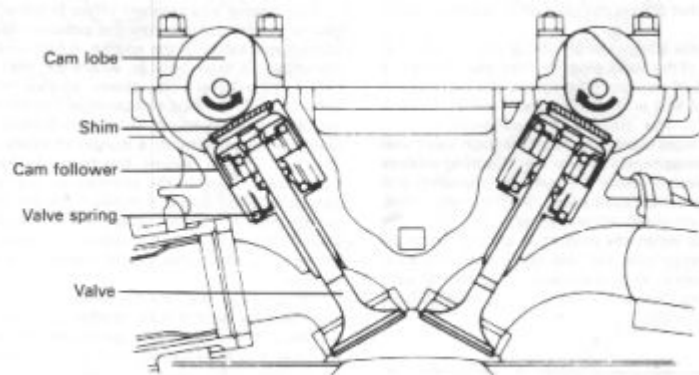


Fig. 1.20 Section through typical dohc valve train showing cam followers and shims

Figure 1

lobe pushes down on the valve to open it, and a spring returns the valve to the closed position once the camshaft is no longer acting on it. In order to maximize power, you want to get as much air into the engine as quickly and efficiently as possible, combust as much fuel and air as you can, and then quickly and fully expel the spent exhaust gas to make room for fresh fuel and air. Issues arise with this design because the camshaft must be cast in a shape that allows it to open the valve quickly and hold it open for as long as possible while still remaining capable of rotating quickly while riding against the shim. This results in a parabolic cam profile shape (see figure 2). Thanks to Freevalve, a new type of valvetrain allows us to eliminate the camshaft entirely in favor of an electronically controlled pneumatic-hydraulic valve actuation system.

the valve to open it, and a spring returns the valve to the closed position once the camshaft is no longer acting on it. In order to maximize power, you want to get as much air into the engine as quickly and efficiently as possible, combust as

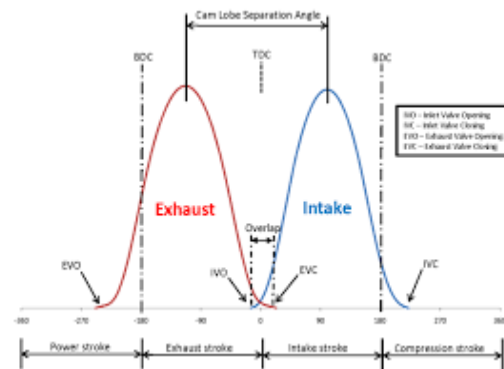


Figure 2

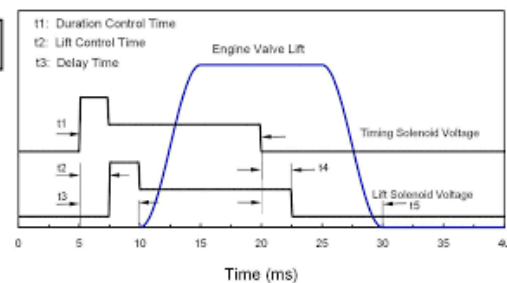


Figure 3

Utilizing a burst of compressed air combined with a locking pin that is hydraulically engaged via engine oil, Freevalve is able to achieve a nearly square "cam" profile (figure 3). This increases power, reduces fuel consumption, and allows for complete control of an engines valve system.

Because of the ability to now individually control every valve separately with an actuator, many systems can be eliminated. No longer are timing chain or belts, camshaft gears, and camshafts needed, allowing for engines to be shorter in both length and height. This reduces rotating masses, overall weight, and brings the center of gravity lower in the car to allow for better handling and safety.



There were 2 Voskhod launches and 5 occupants were launched to orbit.



There have been 142 Soyuz launches and 376 occupants were launched to orbit.

Automobile manufacturers can also build cars with lower hoods thanks to the shorter engine design, as many government safety regulations require a certain amount of space between the engine and hood for pedestrian impact safety.

Furthermore, the throttle body can be omitted entirely. This is accomplished by throttling the air using the intake valve itself. Controlling engine speed using the valve directly increases the throttle response by removing the low pressure zone between the throttle body that is restricting air, and the intake that is sucking air into the combustion chamber. Doing so allows an engine to have atmospheric pressure (or more with turbochargers) in the intake manifold instead of the typical vacuum (thereby reducing fuel consumption).

When utilizing a turbocharger on a typical ICE engine, all of the exhaust gases are routed through the turbo exhaust housing to spool the turbo and build boost pressure, and a wastegate opens and closes to bypass the turbocharger exhaust wheel and stop building boost when the target boost pressure is reached. By routing every other exhaust valve to the turbo, and the others straight through the exhaust, the need for a wastegate is eliminated, therefore reducing weight and cost by controlling how much exhaust gases reach the turbocharger depending on which exhaust valves are being utilized.

In order to be effective, a catalytic converter must be very hot, and a turbocharger can cause it to take longer to reach operating temperature. Typically, manufacturers install a pre-catalytic converter to get around this issue. A turbocharged engine with Freevalve technology is capable of eliminating the very expensive and heavy pre-catalytic converter entirely while maintaining equal or better emissions by no longer feeding all of the gases through the turbocharger. This, in conjunction with a modified combustion cycle during cold start conditions, allows a Freevalve engine to direct all of the exhaust gas to the main catalytic converter with a very high exhaust gas temperature in order to get it up to operating temperature far quicker than conventional camshaft driven engines.

As with any new technology, reliability is a concern. In interference engines (where the valve and the piston are capable of occupying the same space at different points in the combustion cycle) a timing belt or chain failure could result in catastrophic engine failure where the valve makes contact with the piston, bends or breaks, and the piston either destroys the valve (sending metal shards through your oiling system to wreak havoc on your engine) or renders it unable to seal properly. With Freevalve there isn't a physical cam lobe holding the valve in place, and the natural state of the valve is to be closed, so timing failure can result in the piston simply pushing the valve to its closed position (assuming the valve angle is shallow enough). Moreover, if the engine management system senses that a valve is malfunctioning, it can disable that cylinder entirely by closing all of the valves and cutting fuel and spark. This also allows for complete control over cylinder deactivation for fuel consumption improvements. A V8 could run as a four cylinder on the highway and reactivate under load to restore full engine power.

In the pursuit of further increasing fuel economy, a Freevalve engine can move between operating under the traditional Otto cycle for combustion (favoring power) and a version of the more efficient Atkinson cycle (favoring fuel efficiency over power density). In a combustion engine running the typical Otto cycle, the piston travels the same distance during every stroke, so the compression ratio remains static throughout the cycle. This is great for power density, but some of the energy from the ambient pressure remaining after the combustion stroke is used to expel the exhaust gases from the cylinder, thereby reducing thermal efficiency. By utilizing a shorter intake and compression stroke paired with a longer combustion and exhaust stroke, the Atkinson cycle uses all of the energy in the cylinder to improve thermodynamic efficiency. Traditional Atkinson cycle engines use a complex linkage system to vary the stroke and compression ratio, but this is not feasible for production automobile engines, as it is locked into the Atkinson cycle only. The modified version of this cycle (often called the Atkinson-Miller cycle) uses a unique valve timing technique of leaving the intake valve open slightly longer to mimic a shorter intake and compression stroke.

This allows an engine such as one equipped with a Freevalve or variable valve timing system to switch between the Otto cycle when power is needed and the Atkinson-Miller cycle when fuel economy is favored.

The benefits of this new technology are numerous, and the full extent of them aren't covered in this article (such as the ability to switch between different fuel types such as diesel and gasoline). Freevalve will hopefully be licensed out to other manufacturers in order to prove its capabilities to create more environmentally friendly cars without sacrificing performance. Perhaps using Freevalve in conjunction with amazing advancements in gasoline engines such as Mazda's Skyactiv-X engines could see even more revolutionary designs. For now, you can see the technology implemented in the upcoming Koenigsegg supercar set for release in 2020, or through the cars produced by Chinese company Qoros in the near future. While this will not necessarily save the internal combustion engine from death by electrification, it'll certainly extend its life.



There were
135 Space
Shuttle launches
and 852
occupants were
launched to orbit.

RPi Handheld

[Tony Moreno]

Often times, I sit back and wonder how far we have come with technology from the first PC built in a garage, to the popularized game console in homes.

I started thinking about how best to revisit my youth playing my Super NES without buying an exorbitantly priced used console that will allow my son to enjoy the games I did as a kid. Sure, there are methods to jailbreak or mod a Sony PSP, download emulators on my phone, but perhaps I could do something I had not tried before; using a microcomputer to build a handheld arcade. After some research I landed on using a Raspberry Pi 3 to use as the core of this build. There are many other single board computers by others such as the ODROID and ROCK64, however, I found a prebuild OS and some STL files to build the handheld. These pre-generated designs, requiring minimal alterations fit with my idea of what I'd like to give my son. A handheld reminiscent of an old GameBoy, made of a durable plastic polymer, that can be used to play nearly all old consoles and arcade games.

Gathered the parts and dove right in. Given that I use Linux daily I didn't foresee the programming part of the project to be an issue, and it wasn't. Installation and configuration of the RetroPie OS was a breeze. The hard part of this, was the modifications needed to the board. Now to be transparent, I am not the best at soldering, and in learning the complexities of this project half way through de-pinning the 40 GPIO pins, I nicked the Broadcom chip rendering the first Raspberry Pi to nothing more than a fancy paperweight.

The second Pi, having learned from my mistakes of the first one, went much smoother. That is until the time came to start soldering and wiring the custom input PCB, audio and visual, and power management to the RPi.

Weeks later, having gone through multiple types of wire; solid, stranded, silicone and PVC, of assorted gauge I finally was done with the soldering iron. Now it was time to assemble it all together after having taped it off with Kapton tape, a coating or two of conformal coating where necessary. It hadn't occurred to me, that closing the clam shell 3D printed case was going to be a tight fit when all the internals have been squeezed into an already claustrophobic build. So, as with many projects that are new, I made the mistake of squeezing a bit too tight and irreparably cracked the case.

Now I had to decide if another 3D printed case, along with redoing some wire to shorter lengths and then risking the potential damage of more components was worth it, fiscally, for something I could've similarly bought off eBay.

Nevertheless, I bought another case, desoldered everything, took additional measurements, resoldered with new wire 24-gauge solder copper wire with silicone coating, and reassembled it this time being mindful of where pinch points were, the standoff screws, things that got caught during the last assembly.

Overall, the project was a success and a financial sinkhole. I would recommend it to someone who enjoys building fun and interesting projects that are complex and require some forethought and consideration. I am able to play games I no longer have a working console to play and so are my kids.



There have been 6 Shenzhou launches and 14 occupants have been launched to orbit.

Tune Your Room!

[Jason McMullen]

When designing a room for conferences, discussions, or presentations, the sound of the room itself rarely comes up. It might be thought that sound treatments impose an 'unnecessary' expense or that it can be too complicated to determine which solution would be best for the space. However, ignoring sound reflections in a room can cause poor sound quality, the potential inability to hear properly in certain areas of the room, or ear fatigue.

Here are some basic sound issues that can be easily and inexpensively addressed:

- Problems mostly arise from sound bouncing off hard, reflective surfaces.
- Problem frequencies are difficult to treat at the walls due to the relationship between standing wave pressure and sound velocity.
- Absorption without diffusing can cause more problems than it solves.

Absorbing sound

For our first issue, we can eliminate sound bouncing off reflective surfaces by breaking the surface up with strategic placement of sound absorption material (soft furniture, sound absorption panels, bookcases, etc.) We can also diffuse the sound reflections, which we'll address shortly.

Unfortunately, absorption material placed directly on these surfaces has less of an effect than distancing them away from the surface. In order for absorptive materials (fiberglass, rockwool) to perform their function, sound waves must pass through them. Sound waves are converted to heat when the moving air molecules contact the pore walls within the absorptive material. The velocity of the wave is decreased as the pressure builds at the wall which limits conversion/absorption.

The easiest remedy is to place the material in the corners of the room where two walls or a wall and ceiling meet (dihedral) and where two walls and the ceiling meet (trihedral). This corner placement will leave a gap behind the sound panel to absorb more effectively.

Too much of a good thing

Uniform absorption with a single product and thickness can cause problems by removing specific frequencies of sound and thereby leaving others to appear amplified. Over absorption can also leave a room sounding 'dead' or sterile. Sound diffusors can be used in conjunction with absorption to bring life back into the room and even make the room sound larger than it is. Diffusors scatter the sound waves in different directions reducing the occurrence of standing waves.

Dispersing sound

Diffusors can be constructed in a variety of ways and materials. Typically, reflection phase diffusors are used in larger rooms. These are usually constructed out of wood and can appear as very interesting works of art. Their designs are based on mathematical algorithms to determine the type of dispersion and the frequencies that are affected.

Binary amplitude is the other main diffusor type. These alternate between sequences of reflective and absorptive materials. These are thought to be better solutions for smaller rooms because they do not color the sound in close proximity as much as reflection phase designs. Also, they combine absorption and reflection in a single panel and conserve space.

Your room has a sound all its own

Even a small amount of treatment can make a large difference in your experience. Don't forget the part the room itself plays in the total audio and presentation system!



7 miles is the
typical cruising
altitude for
commercial
jetliners.

Boot Camping an iMac [Jessica Keay]

With the new Welcome Center came new machines for our Dining Marketing users. They were all running on old mid-2011 to mid-2012 iMacs and wanted new iMacs so they could continue to do all their marketing projects within the mac OS, but they also wanted the ability to run Windows so they could use some of the applications that only run on the Windows OS. They didn't want parallels, they wanted the user to be able to pick which OS they wanted to work from that day. We ordered 8 brand new iMacs with boot camp and I went to work imaging the first one. I booted it up as normal, went through the steps of adding it to the domain, you know typical new iMac procedures, but by the time I got to installing Windows, I was at a standstill. How was I going to image this thing like we would a PC? I could add the Windows ISO from the shared drive in the boot camp application, but I would have to spend quite a bit of time locking the machine down. I tried different tactics, such as creating the partitions first so that I could image on one partition with Mojave and then put Windows on the other but when it came time to add Windows, it would override the mac OS and wouldn't allow me to alter the partition to try and add the OS back on. I consulted with Matt Fenton to see if maybe he had any insight as far as how to go about this. We looked at the current task sequence that was used where I noticed that it currently stated to use the entire drive when partitioning. I wondered if we could allocate half the drive and try to see if it would work. With the help of Matt, I copied the original task sequence we use, and altered it to only take up half of the memory when imaging the machine. It was a success! The next dilemma I encountered was how I now make the excess drive available for use since it was showing as being there but not useable. Keith brought up checking the disk partitions in the Windows side, and sure enough, there was the rest of the drive waiting to be made available. All I had to do was format the volume and then go into the mac disk utility and format it for mac OS. Upon completion, I was able to load Mojave onto the remaining side and then tested going back and forth between Mojave and Windows 10. It worked like a champ and I never even had to use the boot camp application to make it work. The default OS will always be Mojave but if a user wants to use Windows, upon starting the machine, they hold down the options key which will present them with the choice of mac OS or Windows. Now all of our iMac users within Dining Central have the capability of using either OS without having to have a PC taking up extra space.

Here's a quick run-down on how to "boot camp" and iMac:

1. Image the iMac just like you would a PC with an altered task sequence.
2. Go into Windows and make the partition available to the mac side for imaging.
3. Get into disk utility, enable the empty partition, and apply the mac OS
4. Ensure both sides are communicating with AD and that they are named appropriately. I used our normal naming sequence to get them added.
5. Use SCCM to add things to the Windows side, and JSS to add to the mac side.

There a lot of extra details that go into this process and I have them written down in the event that someone needs to be able to mimic this process.



16 miles is
the minimum
altitude reached
by spy planes.

How to Use Your Tax Refund to Build a Computer

[Jason Huff]

April has arrived and all the trappings that come with: cool mornings and warm afternoons, pollen allergies, and tax season. While many lament and gnash their teeth, some use the federal government as their personal savings, withholding much more from their taxes than they have to pay. If you're like me, then April is second Christmas for you and your family. Perhaps you're thinking about replacing one of the more expensive household appliances, the family computer.

Because we work in IT, we are often the de facto IT department for our homes and families. At least that's how it is for me. Despite this, I would still make our home computers an afterthought. I would invest a lot of money into a computer and upgrade a few years later because when someone else builds your computer they can charge a premium for stock parts. Not only that, but often the stock computers offer the least efficient configurations of the hardware per dollar. Take, for example, the ever-popular Apple Macbook Pro. Now this is a fine laptop; I've owned more than one. But there's also a high price floor and for not much in the hardware department. When all is said and done you're paying more for less. And why? For many, the idea of building a computer induces anxiety and headaches and a desire to take a nap until the whole problem goes away. But I'm here to tell you there are reasons to push through these feelings and eventually discover the process proves less difficult than you thought.

But this is not just about dollar/teraflop or whatever measurement you want to use. There's a real sense of accomplishment that comes from building a PC, and a sense of ownership you don't get with a pre-built, store-bought plastic block that you had no participation in creating. If you're willing to take this journey, I'm going to walk you through the basics of researching parts, planning your build, easily-missed considerations, and how to personalize your build. Hopefully, you will feel empowered to use your tax refund to upgrade your computer life.

Research

Perhaps the most fundamental reason for fear of PC building is lack of knowledge. And believe me I understand. The first time I upgraded one of my PCs was in 1996 and all I had to go on was poorly written instructions I spent hours looking for without Google. Luckily, much of the headache has been removed with the modern internet.

Start with YouTube. This may sound obvious, but it's difficult to overstate how good a resource YouTube can be for building a computer. Content creators have made a veritable cottage industry on this site out of build tutorials and answering every question about hardware imaginable. Not only that, but video reviews exist for most hardware. This can help to tame the anxiety a bit, especially in terms of product knowledge.

The other internet stop you do not want to miss is PCPartPicker. This site is dedicated to planning your build, but is perfect for research as well. For every part, they keep a database of reviews, prices and vendors, allowing you to get the best price for a product.

Planning

When planning a build, it's important to understand what parts are necessary.

CPU – Often thought of as the brains of the computer, but maybe the more apt way to think about the CPU is the logical part of the brain. The part that can do math and understand problems.

CPU Cooler – Sometimes cheap coolers will come with processors, but better ones are available separately and I highly recommend looking into one as stock coolers are not great.

Motherboard – If the CPU is the logic of your brain, then the Motherboard are your neural pathways. Everything connects to the motherboard. If your processor needs something from memory, it has to go through the motherboard. Most motherboards



25.7 miles is the world's highest skydive and the record is held by Alan Eustace who made this jump in 2014.



50 miles is
the edge of space
as defined by the
US Air Force, FAA
and NASA.

have built in video.

Memory – While you'd think the most apt metaphor for memory is, well, memory (duh!), it's more specifically akin to short term memory.

Storage – This would be your long term memory. Files from here are placed into memory when needed.

Case – This is the skull of the computer. Technically not necessary, but you probably want one anyway. Often cases will come with case fans, but aftermarket options are available and often quieter for better cooling.

Case Fans – The importance of airflow in your case cannot be overstated. This will determine how hot your components can get, which will determine how long they will last. If you're running at redline all the time, don't expect your components to last as long as they could. This will also determine how much dust can get in. If you pull in more air than you push out, then the air will push out of every nook and cranny in the case, preventing dust from being sucked in and allowing your computer to run cooler.

Power Supply – This is where my brain metaphor falls down. Basically, this is how you get electricity to all your computer parts.

Your build is going to take a number of factors into consideration, but the most important part is determining what hardware works together. With Memory DIMMs, CPU sockets, PCIe slots, and power cables, the whole process can seem a bit overwhelming at first. That's why you have PCPartPicker. While it's important to learn what all of this means, if you're concerned about compatibility, PCPartPicker will tell you if any of your parts will not work together. This can be invaluable in learning the idiosyncrasies of certain hardware. Thinking about getting an M.2 drive? PCPartPicker will tell you if an M.2 drive disables SATA slots on your motherboard. Want an AMD processor? PCPartPicker will let you know that you chose an Intel socket motherboard. Building a computer is like assembling a puzzle. The pieces fit together in one way, so you don't need to force anything.

You don't need a whole lot to build a computer, and a basic computer can be built fairly cheap. Of course, the more power you want under the hood, the more it will cost. Like everything, you will find a good balance.

The Extras

While a big amount of attention is paid to the computer components, often the tools needed to build can fall by the wayside. When budgeting, don't forget to plan for the things that will not go into the computer.

While many cases are moving to tool-less designs, you're still going to want a screwdriver set. Many places that sell computer parts will also sell a computer repair set. They're not especially expensive when comparing to the total cost of a computer, but it's a good idea to not go with the cheapest set. You will be working with the screwdriver more than any other tool, why not treat yourself?

Another important tool is an anti-static mat. When handling electronics, you want to make sure you're grounded. Especially when these electronics represent a big personal investment. That doesn't mean you should fear them or treat them with kid gloves, just be aware of the necessary precautions and take them. Anti-static wristbands are not a bad idea either, and many anti-static mats will come with them.

Cable management can make a huge difference in the appearance of your computer, but also in performance. Without any cable management, expect wire to be strung across the inside of your case, impeding airflow.

Remember, if you plan out what you need, you'll be less likely to realize you're in the middle of your build and cannot continue because you're missing that crucial tool.

Personalization

Now, the fun stuff. Probably the most satisfying aspect of building your own computer is being able to personalize. The PC has to be one of the most used appliances in the home. Why not make it reflect who you are? And when it comes to PC building, the amount of personalization is entirely dependent on you. Some

people go so far as to personalize the cases they build in (I've seen computers built in everything from toasters to R2-D2) and some just want a nice light show.

Don't be afraid to spend a little more to make this PC your own, even if it means cutting costs elsewhere. This will be your main computer for years. It should reflect who you are.

One of the more subtle ways to customize your build is to use custom cabling. While the braver will customize the wiring themselves, you can purchase custom cabling from most online retailers, and from specialty online boutiques. Not only will this wiring be unique to you, but it looks cleaner in your case as well. Along with the custom cabling, many retailers sell cable combs to keep the cables looking nice. These can be customized as well. Some will sell normal plastic combs in a variety of colors, but some will also sell LED combs that you can control from a motherboard or an RGB controller.

Speaking of lights, most aftermarket components sold today have some form of RGB option you can buy to add color to your case. Everything from case fans to motherboards will light up these days. Even some CPU coolers. If that's not you, though, there's nothing wrong with a minimalist build, and some companies cater specifically to the market that wants form to follow function.

If you have a style, I guarantee someone is catering to it.

To keep a long story short...

No matter what you are looking for in a computer, there's someone who has figured out how to make it. And chances are they have a YouTube channel. I hope you will consider leaving the rut of pre-built systems behind and take a chance on building your own. No computer is as rewarding as the one you build yourself.



55.9 miles is
the highest
altitude reached
by Virgin Galactic
SpaceShipTwo.

Create a Photo Slideshow DVD

[Matthew Trammell]

I hope that all of you had a great summer and that you were able to take some time off to spend with family and friends! Perhaps you have collected some photos documenting your summer adventures. Maybe you have some photos from past adventures, family photos, wedding photos, graduation photos, etc. that you would like to archive or share with others in a creative way. In this article, I am excited to share with you how to create a PowerPoint Photo Album with your photos, export it as a video, and then use a free application that I found, called DVD Styler, to take that video file and burn it to a DVD along with an interactive title and chapter menu(s). Sound complicated? No, not really! I will walk you through how to create a Family Vacation slideshow DVD. Feel free to follow along and customize the project as needed to meet your specific needs.

Gather and Organize Materials

Before starting any project, it is generally a good idea to figure out what you need. It will definitely help you to have some familiarity with PowerPoint. In addition, you will need the following:

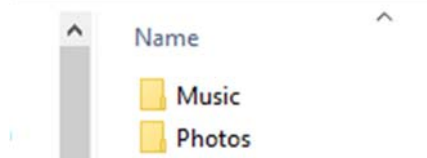
1. Photos. Stored on computer. If you have physical photos, you will need to scan each photo in as a picture file (JPG, PNG, BMP, etc.) and store them on your computer. I chose to name my pictures, image01, image02, etc. for quick reference.
2. Music. PowerPoint supports many audio files. I chose an iTunes Music, M4A file
3. Fonts. Since you will ultimately create a DVD video, you can be creative with the fonts in your PowerPoint slideshow and DVD menu layouts. You do not have to worry about the font being available on the recipient's computer or DVD player. You can install custom fonts by copying a trusted, valid font file to the C:\Windows\Fonts folder. Note: You will need administrator privileges to install new fonts.
4. Microsoft Office PowerPoint 2007 or higher. I will use Microsoft Office PowerPoint 2016
5. DVD Styler 3.1. Download from <https://www.dvdstyler.org/en/>

I also recommend that you organize your project files on your computer.

1. Open File Explorer. Navigate to your My Documents folder
2. Within My Documents, create a folder called Family Vacation
3. Open Family Vacation folder
4. Within the Family Vacation folder, create two folders called Photos and Music
5. Copy your photos to the Photos folder
6. Copy your music to the Music folder

Your project folder should look like the following:

PC > Documents > Family Vacation

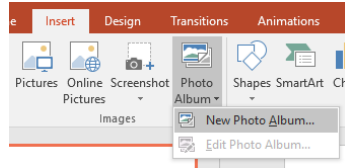


62 miles –
space begins
here!

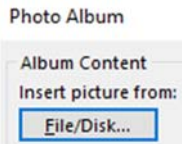
Create Your PowerPoint

Now that your project files are organized, it is time to create your PowerPoint slideshow.

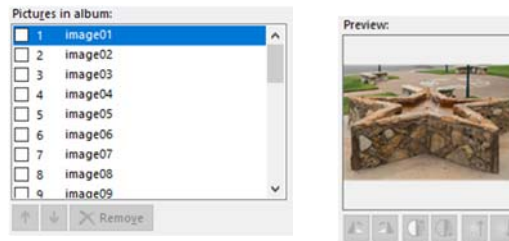
1. Launch Microsoft Office PowerPoint 2016
2. Choose Blank Presentation
3. Navigate to Insert and Choose Photo Album. Then, choose New Photo Album...



4. Once the Photo Album dialog loads, click File/Disk...

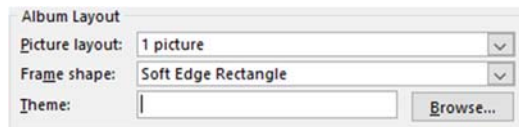


5. Browse to your Photos location. My Documents → Family Vacation → Photos. I put 30 photos in that folder that I would like to add to my Photo Album. I will go ahead and select all photos using the shortcut key Ctrl + A. Then, I click Insert. You will see a list of pictures in your album:



The Pictures in album pane has a move up, move down, and remove button. You can choose to check a single picture or multiple pictures. Once you select your picture(s), you can move them, as a group, up or down, or remove them from your album.

6. Next, let us look at the Album Layout pane. The default picture layout is "Fit to Slide". The default frame shape is "Rectangle". I want 1 picture per slide with a soft edge rectangle, so I adjusted my settings accordingly:



7. This frees up the picture option "Captions below ALL pictures". I would like to do that too.



70 miles –
highest altitude
reached in 2004
by Virgin
Galactic's
experimental
SpaceShipOne.



**BONUS
Brainteaser ☺:**

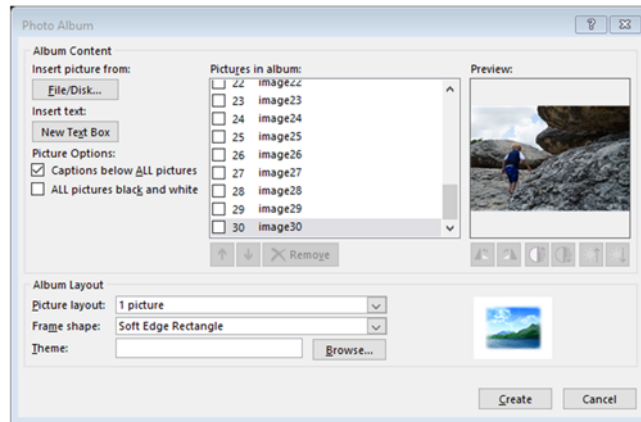
Abyssinia is to
Ethiopia as
Burma is to

(Cambodia,
Persia, Myanmar,
Kampuchea,
Benin)

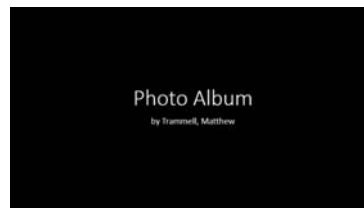
8. I would like to note that you should have all your pictures ready at this time. You can go back a few steps to where we chose New Photo Album, and choose Edit Photo Album to add more pictures at a later time, but keep in mind the following warning:

Changes you have made to photo album slides outside of the Format Photo Album dialog box, such as slide background and animations, may be lost when you click Update. You can recover those changes by clicking Undo on the Edit menu.

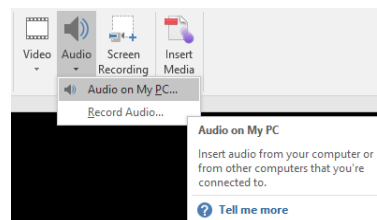
I am ready to create my album. Click Create



9. Before moving on, save your work! File → Save. I will save my Photo Album to My Documents → Family Vacation using the filename "Family Vacation.pptx". Click Save.
10. I would like to change up the title screen a bit. It was a vacation, so have fun with creating the title screen. Below are my before and after photos. Feel free to be creative as much as you like.



11. Next, I would like to add music. Select the first slide again. Go to Insert. Then under Media, click Audio.



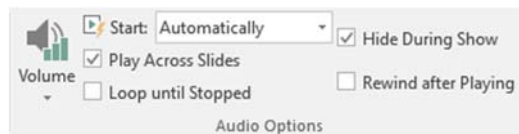
12. Browse to the Music folder within your project and select your song. My kids are young, four and two, so I chose a fun song that they both enjoy. Click Insert when done.



13. An audio icon, shown below, will pop up in the middle of your slide. Feel free to move it to the upper left corner of the slide so that it is out of the way

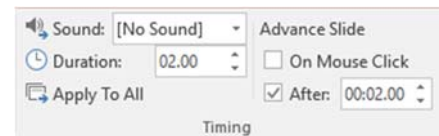


14. You will want to look at the Audio options and make the following adjustments, so that our song will play throughout the entire show

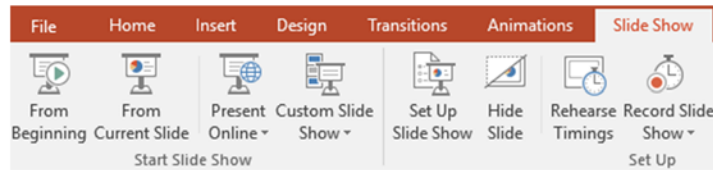


15. Now, we need to check Transitions. Click Transitions. Select all your slides in the Slide Selector view. Ctrl + A. Set the transition to Fade

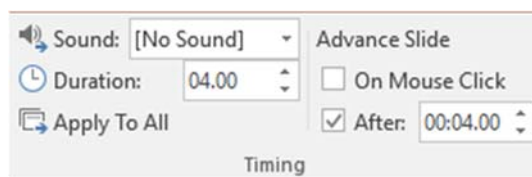
16. For Timing, make the following adjustments and click Apply to All for good measure:



17. Now, it is time to test your show. Click Slide Show and Click From Beginning

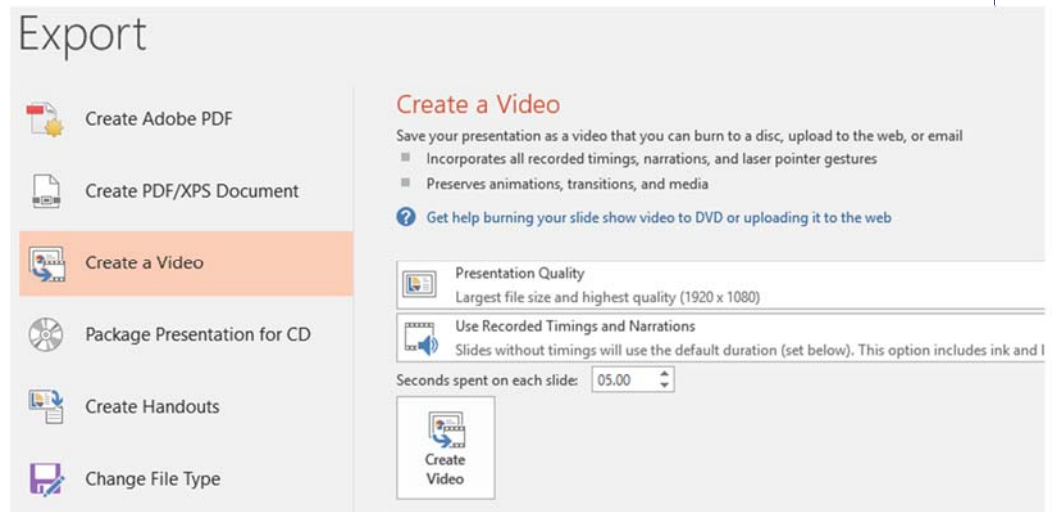


18. My 31 slide show finished a bit early, before the 2:16 song ended. I added 2 more seconds to slide 1 and slide 31. This time, **do not** click Apply to All



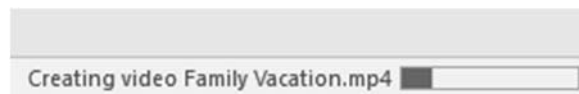
The 1857 Revolt or Sepoy Mutiny is also known as India's First War of Independence. It started in Meerut on May 10, 1857. It was an attempt to unite India against the British oppression.

19. Do you remember how we chose to add captions to each picture? Do not forget the captions! I will go through my show and edit those.
20. Play through, review, and edit your show as needed. Once you are happy, it is time to turn it into a video. Go to File → Export → Create a Video



The default settings are fine. Click Create Video!

21. Save the video as an MPEG-4 video file to your Family Vacation folder. Click Save and watch your video export! Well, depending on how many slides you have and your computer specifications, this could take a little bit. Therefore, you may want to take a break and come back!



Create Your DVD

Now that you have your MPEG-4 video file, we can create the DVD. I did a bit of searching for a DVD program and I came across a free program to help me: DVDStyler!

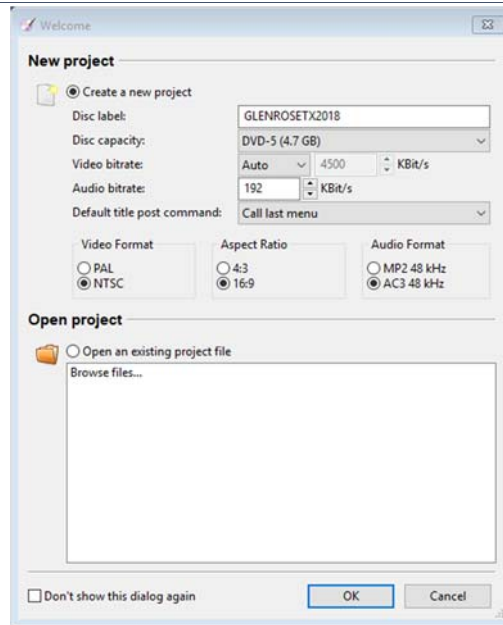
1. Download the program from <https://www.dvdstyler.org/en/> and install it
2. Go ahead and launch the program when prompted. If you chose not to open the program during the install, double click the program shortcut on the desktop. A New Project dialog will appear
3. First, you will enter the New Project info:



Neutron stars
can spin 600
times per second.

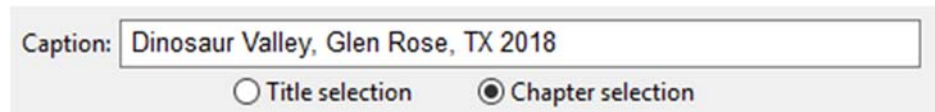


Only John Hancock actually signed the Declaration of Independence on July 4, 1776. The rest signed later.

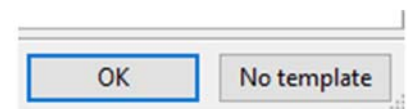
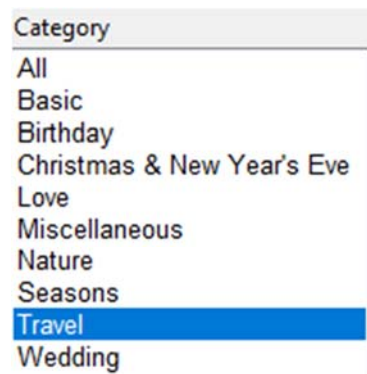


Be sure to update the disc label, video format, and aspect ratio. Choose NTSC as the video format because we are the United States. Additionally, widescreen is the common video format, so choose 16:9 for the aspect ratio. Once done, click OK

- Now you have the option to select a template for the DVD menus. First, you will want to update the caption. Second, you can choose title or chapter selection. Because this is a single video, I will choose to have chapter stops. Therefore, I will select Chapter selection



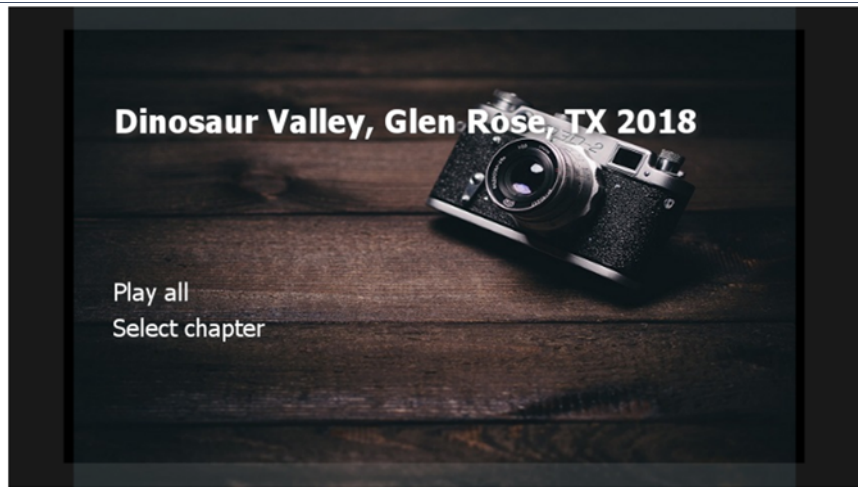
- Since this is a Family Vacation, I will choose the Travel category. This gives me two choices. It is a bit hard to see, but I will choose the first template, the camera one:



Click OK



The stars on the original American flag were in a circle so all the Colonies would appear equal.



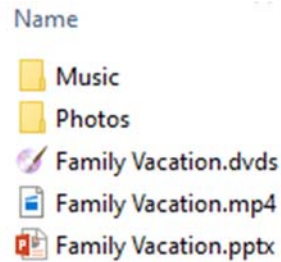
6. This is what my title screen looks like so far. I want to make some changes. Double click on the title text. Change the text box to:
Dinosaur Valley
Glen Rose, TX
2018
7. Change the fill color to Orange. Click OK
8. Double click the Play all text. Change to Play Slideshow. Change text color to green
9. Double click the Select chapter. Change to Select Chapter. Capital C. Change text color to green
10. After some quick customizations, the title screen should look like:



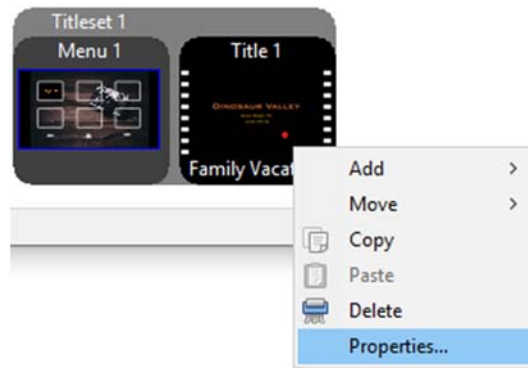
11. Now it is time to add your video. Click the File Browser. Navigate to your video file. C:\Users\



12. Save your project. Your Family Vacation folder should now look like:



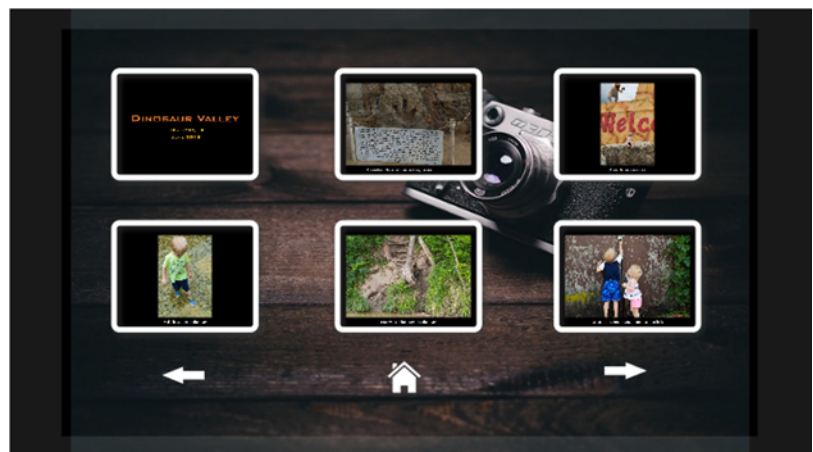
13. Now for the tricky part. Well, maybe not tricky, but definitely a little time consuming. You need to figure out where you would like the chapter stops to be. To figure this out, play your MP4 file within the Movies & TV app. Just double click on the MP4 file with File Explorer to open your MP4 file. Press pause where you would like to include a chapter stop and make note of the time elapsed. I decided to create a chapter stop at each verse and chorus of the song I picked. I came up with the following chapter stops: 0:00, 0:37, 0:56, 1:17, 1:36, and 1:57. To add your chapter stops list, right click on your video, show in Titleset 1, Title 1. Choose Properties.



14. Add your chapter stops in a list like I have:

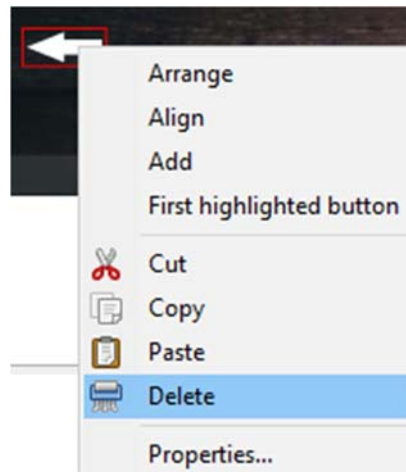


15. Once you enter your chapter stops as I have above, click OK. And watch as the program fills in the squares with snapshots from your video:

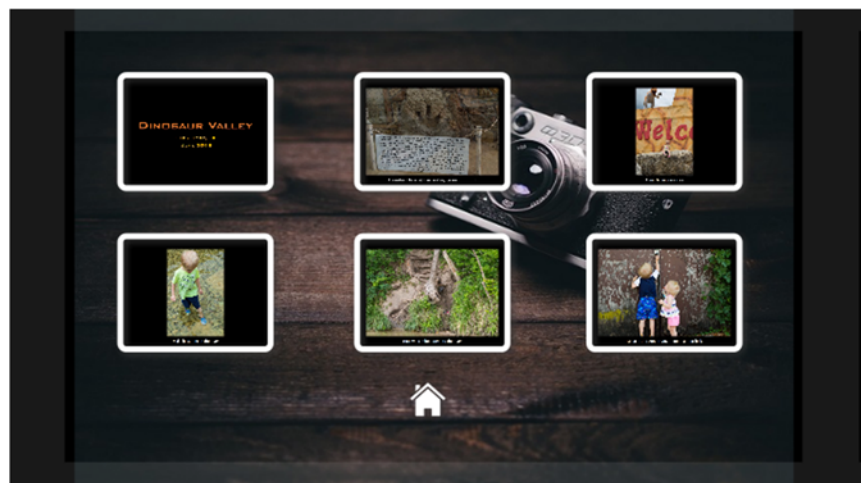


The White House held its first 4th of July party in 1801.

16. I only have six chapter stops. Therefore, I do not need navigational arrows. Right click on each of the arrows and choose Delete:

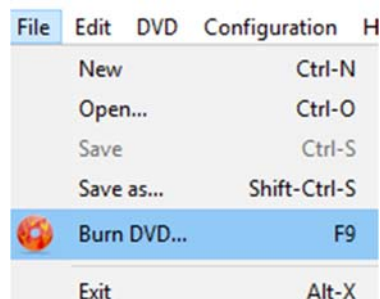


17. Now, my chapters title slide looks like so:



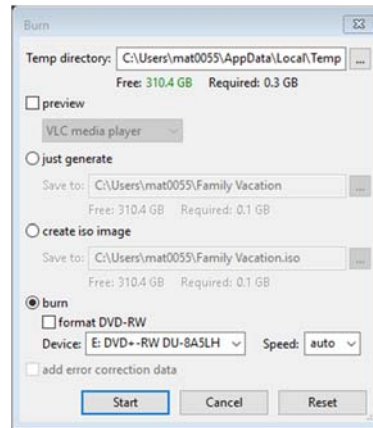
18. I am happy with my chapters title screen. Now that both my title screen and chapters title screen is complete. It is time to burn the DVD! Press Ctrl+S to save the project.

19. Finally, we need to insert a blank DVD-R into your DVD burner drive. Then you go to File and Choose Burn DVD... or Press F9.



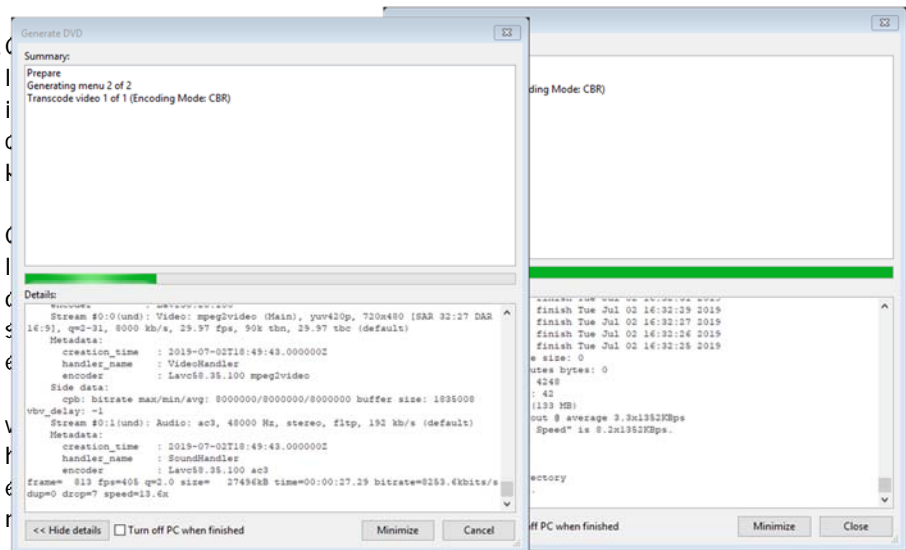
In 1776,
there were 2.5
million people
living in the new
nation.

20.No need to change any options here. Click Start!



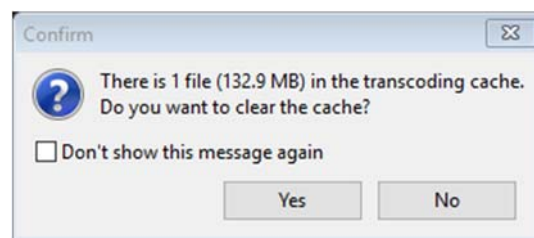
Watch the Generate DVD dialog for the process to complete. Again, depending on the size of your video, you may want to take a break and come back.

21.



Done!

22.Exit the program. The following dialog will appear. You can click yes.



Concluding Thoughts

Now you have a DVD that you can play on any DVD player! We created a slideshow in PowerPoint, exported it as a video, and then used DVDStyler to turn the video into a DVD. I hope that you had fun following along with this project and were able to create something fun and exciting.

If you have any questions, remember that you can press F1 in both PowerPoint and DVDStyler to bring up the help documentation. Google, as always, is a great tool as well.

Thank you and enjoy sharing your memories with family and friends!



100 miles –
an unboosted
satellite would
last about a day
before being
pulled back to
earth.

MIT's Time-Locked Capsule [James Taylor]

In 1999, MIT celebrated the 35th birthday of the university's Laboratory for Computer Science. As part of the celebration, a time capsule was delivered to the renowned architect Frank Gehry who was asked to incorporate the time capsule into the design of the building he was currently designing: the Ray and Maria Stata Center which would house the laboratory upon its completion in 2004. The capsule contained 50 items, some of which were contributed by technological superstars like Bill Gates, Tim Berners-Lee (the inventor of the World Wide Web), Bob Metcalfe (the inventor of Ethernet), and Ron Rivest. Ron Rivest is one of the three people that developed the RSA encryption algorithm that is widely used today to encrypt transmitted messages over networks. He also designed the cryptographic puzzle that would determine when the MIT time capsule would be opened.

The capsule would be opened when one of two conditions were met: when 35 years had passed or when someone had successfully solved the cryptographic puzzle, whichever came first. While the puzzle was fairly simple, it was also designed with the expectation that it would take about 35 years to compute the solution. That's because in order to get to the correct answer, you would have to perform nearly 80 trillion squaring operations. For example, $1^2 = 1$, $2^2 = 4$, $3^2 = 9$, $4^2 = 16$, and so on. The mathematical operations that need to be performed are slightly more complicated than that but the reason it was expected to take 35 years was because you would have to calculate each operation one at a time and then build upon the previous answer.

In April 2019, the puzzle was solved 15 years ahead of time by a self-taught programmer in Belgium. Bernard Farbot read about the puzzle online in 2015 and, intrigued, decided to attempt to solve it. Farbot dedicated one of the processor cores of his home desktop computer to performing the mathematical computations full-time. Fearing that someone with a more sophisticated CPU could beat him to the solution, he kept his efforts secret from nearly everyone around him. After working for three and a half years non-stop, the computer completed all 80 trillion operations. The resulting number was combined with another number that was provided as part of the puzzle instructions and then translated into a readable message: "!!! Happy Birthday LCS !!!". Clearly, Ron Rivest did not expect anyone to solve the puzzle before the 70th birthday of LCS.

On May 15, the CSAIL director and former LCS directors held a ceremony to open the capsule and reveal its contents. Among the most notable of the items that it contained are the following:

- A user manual for VisiCalc. This was the first spreadsheet program, published in 1979, and was the inspiration for Microsoft Excel.
- A paper from 1978 detailing the RSA encryption algorithm.
- The Altair BASIC interpreter. This was the first product made by Microsoft and was donated by Bill Gates in 1999 when the time capsule was first created.
- Tim Berners-Lee's original proposal for the World Wide Web which laid out the HTTP protocol and a description of how HTML would work.

According to MIT officials there are several other time capsules hidden on the university grounds, including one accidentally discovered by a construction crew in 2015. However, that capsule, buried in 1957, isn't due to be opened for another 900 years.

For those interested in reading the original text of the crypto puzzle, it can be found here:

<https://people.csail.mit.edu/rivest/lcs35-puzzle-description.txt>



196 miles –
highest altitude
reached by Yuri
Gagarin on his
orbit around the
Earth, the first, in
1961.

ALEXA Tell Me Who to Talk with at UNT [Ryan Ueland]

Recently the new Support and Services Building was brought online, taking home in the old Sac n Save building off Avenue C. One of the new technologies brought into the buildings concept was an Amazon Echo Plus. Its premise is to test integration of "smart" devices into the UNT office environment with the support of the Amazon Web Services team. This proof of concept project could lead to the inclusion of university purchased "smart" devices across campus.

Alexa for Business was announced by Amazon almost 18 months ago. The premise is simple, to bring in the smart devices currently controlling end-user's homes into the office. Using their considerable resources and consumer support, Amazon feels they can successfully integrate standard office tasks with the use of smart devices.

Amazon hopes to use Alexa for Business as another integration point for business into the AWS universe. As part of this push Amazon announced earlier this year the launch of Alexa for Business Blueprints. These easy to develop Blueprints allow business groups to develop their own voice-activated call and response commands. From Onboarding to general Q&A, businesses would have the ability to customize an array of commands for any Amazon smart device in their infrastructure.

With its introduction at the SSB, Amazon hopes to bring UNT into this universe. The current deployed Echo is housed in the main conference room at the SSB. It is currently capable of checking the meeting status of several meeting rooms in the SSB and reserving a couple of optional rooms. If the room is included in meeting invitations it can also start/join Skype for Business meetings. An initial Blueprint is currently being worked on with the input from building tenants, an attempt to develop call and response help for the building. More options will hopefully be made available as testing is completed, including campus wide meeting checking or call-outs.

Successful testing of this concept could lead to integration of more smart devices on campus. With more devices come control and management concerns. In the hypothetical future, support staff should keep in mind what would be the best practices for the physical and technologic security of these devices. For the SSB Echo, we have had to create a unique resource account for the device and allow it instant access to wireless. If departments begin to request actions/requests from the Echo that would require access to more secure resources, there would need to be serious discussions about how far these devices are allowed.

But always remember, they have a mute button.



200 miles –
without boosters
a satellite at this
altitude would be
dragged down to
Earth and would
burn up in the
atmosphere in
about a month.

Social Media Safety [Zachary Collins]

Using social media sites like Facebook, Twitter, and LinkedIn help people stay connected. But a majority of us don't feel our private information is secure on social networking sites. We're probably right to feel this way: It takes only a few pieces of personal info, including your name, birthday and hometown, for someone to steal your identity. One of the most important things you can do to protect yourself is to not over-share information. When creating public profiles, you don't need to enter all the information a site is asking for. Include only your name and e-mail address.

Here are six tips for how to share less and stay safer on social networks.

- 1. Create a unique password.** Choose hard-to-guess and different passwords for each of your social networking accounts. Your password should be at least eight characters long and a combination of capital and lowercase letters, numbers and symbols. The less unique your password is, the more frequently you'll have to change it.
- 2. Clue in to your privacy settings.** You should manage and regularly check your privacy settings, and make sure that you're only sharing private information with friends and family.
- 3. Never allow automatic logins.** Make sure that your apps aren't set to automatically log you in and that you don't have your computer's browser "remember" your login and password. That way if someone gets access to your devices, they can't automatically access your social sites.
- 4. Turn off geotagging.** Location-based services can be one of the most dangerous features provided by social networking sites since they reveal where you are and who you're with (if you tag them). Most people don't realize Twitter and Instagram both use geotagging (which stores the latitude and longitude of your Tweet or image) for everything you send out. Pictures you take on an iPhone usually store geotagging information as well. While it can be fun to share your location with friends and family, it makes you more susceptible to predators since they can better determine whether you're alone or your house is empty.
- 5. Be selective when accepting friends, posting and clicking.** Social networking sites make it easy to create fake profiles and pretend to be someone else, so make sure you only accept friends who you know in the "real world." If you ever happen to see a strange message from a friend or relative asking you to click on a link in a social media post, or requesting financial information from you, consider it a red flag. If it looks suspicious, even if you know the source, don't click on it.
- 6. Think twice before you post.** Carefully consider the content you post on any social networking site. You may not want your co-workers to see bathing suit photos from your last vacation or discover your strong political views while scrolling through their news feed.



The International Space Station orbits at an altitude of about 250 miles. When it was supplied by the Space Shuttle, its orbit was a bit lower.

Esport Collegiate Regulations [Dylan Wray]

As collegiate esports grows and develops, do universities need to play fair? Regulatory agencies like the NCAA and the NAIA exist for very good reasons as collegiate competitive programs need oversight to make sure no one is getting a car for some exorbitant bonus for signing onto a team, or an athlete held on a university indefinitely to compete and bring prestige to a team.

Esports in the collegiate space have developed over the last five years with the looming shadow of the NCAA. UNT is rather unique as a D1 university that supports a varsity esports team. Many larger universities are investigating or quietly observing how official teams competing in esports do. The vast bulk of programs often fall to private institutions who often are categorically D2 or D3 institutions. This in large part due to fears of institutions that esports would jeopardize a larger universities status in the NCAA.

Why is the NCAA worried about esports? Athletes in esport programs are a part of the greater esports industry. While Esports is getting more and more established it is still an up and coming industry that monetizes just about any aspect related to it. Pro's stream their brand and image on Twitch or YouTube, and it's a legitimate path for an esport player to gain notoriety and attention by professional brands. Additionally, esport players gain popularity by practicing in semiprofessional or armature events for prize money. This is strictly prohibited by the NCAA for their athletes and allowing this would have huge ramifications on how colleges and traditional sport athletes monetize or benefit individually from their affiliation to their university.

Last May, NCAA Board of Governors decided to not regulate esports creating a vacuum and lack of any regulations on this new and developing movement. NACE, the National Association for Collegiate Esports is an organization crafted under the NAIA to attempt to form a regulatory body in the wake of the withdrawal from the NCAA. However not every esport program has signed onto the organization, some sighting membership dues, or the fact that most people in the industry agree, that the developers hold all of the cards anyways.

Riot Games, the developer of league of legends and operator of the LCS and LEC, have decided that the game developers themselves should be the ones that regulate their own collegiate leagues. Riot in a statement in May claims to be working on a separate collegiate division called the RSAA or Riot Scholastic Association of America. This council will be crafted to conduct and regulate all collegiate league of legends play. While some regulations from a stakeholder in esports would likely craft policy that make sense in the esports world, this centralizes the power of the developer as the creator, distributor, and regulator of their title. Additionally, if other developers follow suit, esport programs will have to cater to multiple governing bodies to remain in good standing to compete.

Time will tell if the NCAA, NACE, or RSAA will have an impact on the collegiate varsity scene. I personally believe that a lack of regulation has allowed a wide diversity of collegiate programs to develop in wide shapes and forms. Each campus has a relatively unique spin on how they fund, implement, and manage their program allowing us to learn from each other in what works, and what doesn't. Someday soon though, as more and more colleges sign on, cohesion and order will be stronger than chaos.



With the exception of lunar missions, Gemini 11 at 854 miles was the highest altitude reached by human beings. This record was set in 1966 by Pete Conrad and Richard Gordon.

