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UNT WiFi Expansion Project Progresses

By Dr. Philip Baczewski, Senior Director of Academic Computing and User Services and Deputy Chief Information Officer for University Information

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The New Student Printing Credit System

By Dr. Philip Baczewski, Senior Director of Academic Computing and User Services and Deputy Chief Information Officer for University Information

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By Dr. Elizabeth Hinkle-Turner, Director - Academic Computing Technical Services

This update is for several articles I have written in the past detailing free and/or educationally-priced software for students, faculty, and staff at UNT. The original articles appeared in *Benchmarks* in September 2013 and February

By the Numbers

Down the Corridor of Years

2006

Benchmarks Online publications from 2006 note:

- UNT got a new homepage.
- New Eaglemail Debuts.
- A detailed map of the General Access Computer Lab System became available.
- After years of planning, the majority of the Computing and Information Technology Center's operations moved to the UNT Research Park. Academic Computing and User Services remained in the Information Sciences Building (now Sycamore Hall).
- 8 64-bit dual 4-core opteron nodes were added to the ACUS compute cluster for a total of 56 compute nodes including 50 32-bit CPUs, 104 64-bit CPU cores, 336 Gigabytes of RAM, and about 20 Terabytes of disk storage.
- Horizon Wimba's Voice Tools Suite were integrated with WebCT Vista.
- The Computing and Information Technology Center, the Library, the College of Arts & Sciences, the College of Engineering, and the College of Business Administration cooperated to purchase a subscription to Gartner Core Research Services for all UNT faculty,

2014. Some of that information is still relevant but other options have changed - fortunately, usually for the better! Below is a complete update of software available at educational pricing and links on how and where to get it.

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Access Resources from the EDUCAUSE Annual Conference

By Claudia Lynch, *Benchmarks Online* Editor

The conference is over but you can still access resources from EDUCAUSE 2014.

Read more   BOOKMARK

Today's Cartoon

Click on the link above for an information age laugh.

students, and staff.
- CITC proposed that UNT move to Windows Servers and Microsoft Exchange.

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University Information Technology
1155 Union Circle #310709
Denton, TX 76203 USA
Voice: 940-565-4068
Fax: 940-565-4060

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Last January, University IT, in collaboration with the UNT Systems IT Shared Services division, began a project to enhance WiFi networking on the UNT campus. The initial phases of the project were designed to concentrate on academic spaces to enable use of wireless technology as an instructional tool and to enhance wireless service where students spend a good deal of their time in or between classes.

Over the last eight months, considerable progress has been made on upgrading the WiFi service in key academic buildings and we anticipate that the project will be completed some time in the Spring 2015 semester.

Three Phases

This project is progressing in three phases. The object has been to address frequently used academic spaces as early as possible in the schedule. The table below shows which buildings fall into the various phases and their estimated completion dates.

Phase 1 Estimated Completion: 4/30/2014	Phase 2 Estimated Completion: 11/30/2014	Phase 3 Estimated Completion: 4/30/2015
Auditorium	Life Sciences Complex	Gateway Center*
Sage Hall	Environmental Sciences	Performing Arts Center*
General Academic Building	Language Building	Oak Street Hall
Hickory Hall	Business Leadership Building*	Eagle Student Services Center*
Wooten Hall	Radio, TV, Film, & Performing Arts	Men's Gym*
Art Building	Discovery Park*	Physical Education Building*
Chilton Hall	Matthews Hall	East Classroom Building*
Music Building	Curry Hall	Coliseum*

Willis Library	Chemistry Building	Sycamore Hall*
	Physics Building	

*Targeted deployments for academic spaces or spot improvements

Phase 1 was completed last spring and wireless service has been significantly improved in those buildings. Phase 2 buildings have equipment installed, but the building service has not yet been tuned to achieve maximum performance. Phase 3 building installations will start as soon as Phase 2 is mostly completed. In addition to the building wireless installations, an evaluation installation of outdoor wireless service is being planned. If successful, UNT may eventually be able to provide wireless access along the major promenades and within outdoor plazas where people gather on campus.

Increase in Wireless Devices

While this WiFi project represents a significant increase in wireless networking capacity, it should be noted that the number of wireless devices that students carry with them is increasing as well. Most students have at least one or two devices that can authenticate automatically to UNT's WiFi. In addition, there are some devices that can interfere with UNT's WiFi network and cause degradation of service for those in a particular area. Many printers now have a wireless feature built in. Departments should be sure to disable this feature, since it is not usually needed in an office setting. Also, many smartphones provide an Internet "tethering" feature (sometimes called "MiFi") that can interfere with the wireless radio signals within a 10-foot radius of their phone. To get the best performance out of UNT's WiFi network, it is best to disable MiFi features on your devices and turn off WiFi access on devices you are not actively using.

Over the last several years, wireless networking has moved from being a convenience to being a service that can enable new methods of teaching and access to learning. This project represents a major step forward in UNT's WiFi networking capacity. University IT and IT Shared Services are committed to maintaining and improving this service as WiFi technology progresses.

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The New Student Printing Credit System

By Dr. Philip Baczewski, Senior Director of Academic Computing and User Services and Deputy Chief Information Officer for University Information

In Fall 2014, the University of North Texas instituted a new method of managing student printing in Student Computer labs. The primary reason for the change in procedure is **to enable student printing at campus locations other than in Student Computer Labs and to allow students to print documents directly from their personal computing devices**.

UNT wants to provide a more convenient printing service to students by locating printers at various places on campus convenient to where students gather to eat, socialize, and attend class. However, this more convenient printing can't be provided if there is no limitation on print quantity. The printing credit procedure **puts students in control** of their own printing resource.

Previously ...

Previously, students who printed in Student Computer Labs were not restricted in the total number of pages they could print during a semester. However, strict controls were in place regarding what kinds of materials could be printed and only one copy of a document could be printed at a time. Under the new procedure, students have more leeway regarding what they print and there is no limitation on number of document copies per individual print job, as long as it is within the student's available printing credit.

Available campuswide

The student printing service is available campuswide. In addition to the Willis Library, there are 11 other locations on the main campus and at Discovery Park where students can use their printing credits. (See, http://computerlabs.unt.edu/location-labs) Lab printers in Sycamore Hall, Business Leadership Building, Matthews Hall, Discovery Park, and Eagle Commons and Willis Libraries support the Web Print feature found on http://printing.unt.edu/ allowing students to print output from their own computers without having to check into a lab. Students can also use Web Print at the printer in Sage Hall located on the first floor just outside the UIT Help Desk and plans are to expand printer locations, including multiple locations in the new Union Building once it is completed.

Print credits

Printing activity from the Fall 2013 and Spring 2014 semesters was used as a reference to set the print credit for Fall 2014. In past semesters, about 85% of students who used the service printed 400 pages or less in the Student Computer Labs. Over 90% of undergraduate students printed 600 pages or less and about 90% of graduate students printing 800 pages or less. Half of the 21,000 students who printed in labs last year printed LESS than 100 pages. One student printed over 8,500 pages. The new procedure more equitably spreads the printing resources among students and encourages the efficient use of the lab printing service.

For Fall 2014, print credits have been allocated to all students to allow printing of 400 page images on double-sided output. Undergraduates students are eligible for a credit extension of 200 double-sided page images and graduate students eligible for two credit extensions of 200 double-sided page-images. Extension requests may be made via an online request process found at http://computerlabs.unt.edu/printing. Also, individual lab managers have the authority to grant special "no-credit" printing requests for output such as student-authored theses, dissertations, or large research papers in support of their academic work at UNT. Students who wish to print beyond the provided credits may log into http://printing.unt.edu/ and buy additional credits that will be expended at the cost of $.05 per double-sided output page or $.03 per single-sided page. After this first semester using the new printing system, plans

are to streamline the printing system based on student feedback and printing usage.

Further   information

Information about the student printing service is available at http://computerlabs.unt.edu/printing. If you are working in a lab and have questions or concerns about the printing service, ask to speak with the Lab Manager, or contact or come to the UIT Help Desk in Sage Hall (http://helpdesk.unt.edu/ -- 940-565-2324). Other questions or concerns regarding the new printing system can be addressed to Dr. Philip Baczewski (baczewski@unt.edu), Senior Director of Academic Computing and User Services.

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By Dr. Elizabeth Hinkle-Turner, Director - Academic Computing Technical Services

This update is for several articles I have written in the past detailing free and/or educationally-priced software for students, faculty, and staff at UNT. The original articles appeared in *Benchmarks* in September 2013 and February 2014. Some of that information is still relevant but other options have changed - fortunately, usually for the better! Below is a complete update of software available at educational pricing and links on how and where to get it.

Microsoft Products

Our Microsoft products just get better and better as we continue to migrate all UNT community members to the 365 service and its many components. Faculty members are already on Office 365 email and information about this is found in this July 2014 article. Soon faculty will also be able to enjoy the free Office products and OneDrive sharing service that the students already have on hand.

For the Students

EagleConnect Office 365

All current students receive **the complete Office365 ProPlus for free through EagleConnect**. Students have available up to five free copies of the software for their desktop and mobile devices and for both Mac and Windows OS. Instructions on how to download and install free Office are found in this Helpdesk FYI article. Office 365 ProPlus includes Office 2013 for Windows 7, 8 and 8.1, Office 2011 for Mac OSX 10.5.8 and newer, Office Mobile for iOS 6.1 and newer (iPhone only), and Office Mobile for Android 4.0 and newer. Many students are still unaware that they have this free perk so faculty, staff, and other students are strongly encouraged to continue to spread the word.

For Faculty and Staff

The Home Use Program

Most faculty and staff will want to get Office 2013 for PC or Office 2011 for Mac through the Microsoft Office Home Use Program. This is easy to do: first they should get the UNT Program Code from their Network Administrator. Then they:

- 1. Go to http://hup.microsoft.com

- 2. Select the country to which they want their order to be shipped to and choose the language for viewing the order Web site.

- 3. Enter their corporate e-mail address and program code.

- 4. Place their order online, and it will be shipped to the location they have chosen. Please note that a fulfillment fee ($9.95) will be charged to cover packaging, shipping, and handling costs.
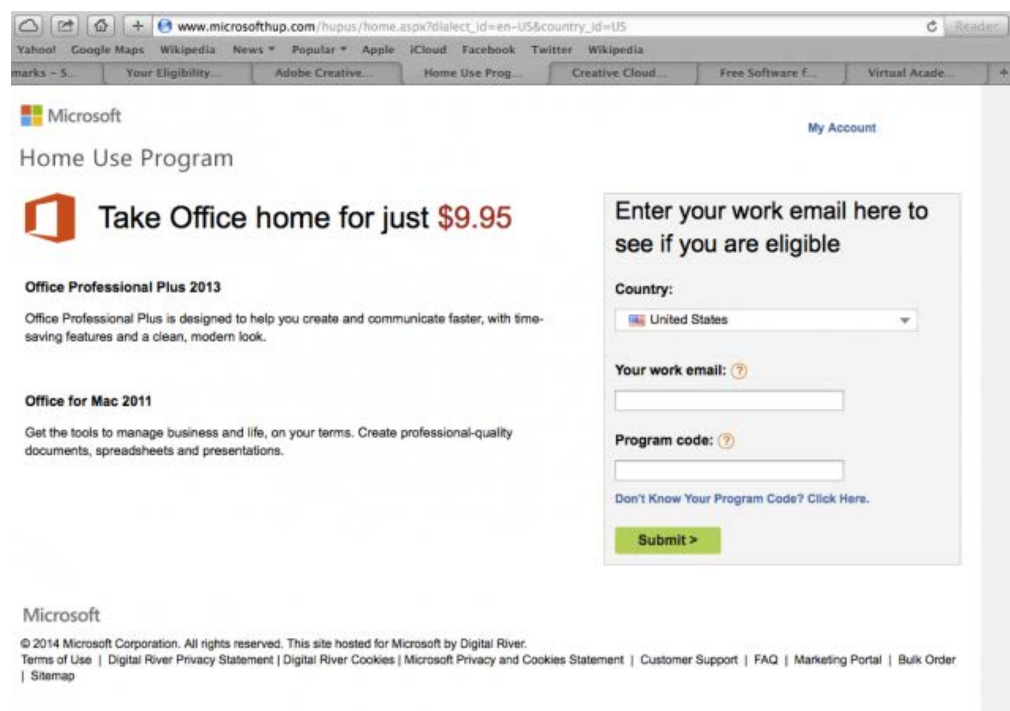
The login page for the Microsoft Home Use Program. Get the Program Code from your Network Administrator

Faculty and Staff can still go "old school" through the bookstore and get the Windows OS too

Faculty and staff can also get the latest Microsoft products including Windows on **cd** by going the the UNT Bookstore and purchasing them for around $14-$16. Complete information on what is available at the UNT bookstore is found here.

Great Microsoft Training for Everyone

All students, faculty, and staff have a terrific training resource through the Microsoft Virtual Academy. There is no charge for this training service:
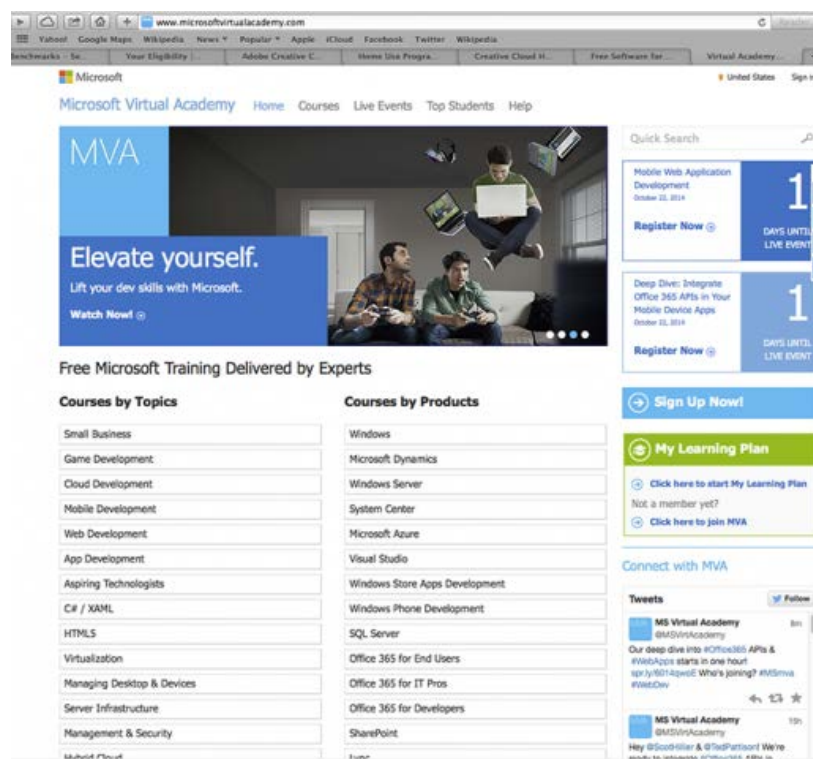
Homepage of the Microsoft Virtual Academy with many training options

Adobe Products

Adobe product offerings and prices remain unchanged. Students can get the Adobe Creative Cloud which contains almost 20 powerful and useful Adobe products from the UNT System Hub for $19.99 per month. Faculty and Staff get home use copies of Adobe products for free by downloading the trial version of the Creative Cloud from the UNT System Hub and getting the product key from their network administrator. Or faculty and staff can go directly to the "hub" site as well and download the suite for $9.75 for immediate use.
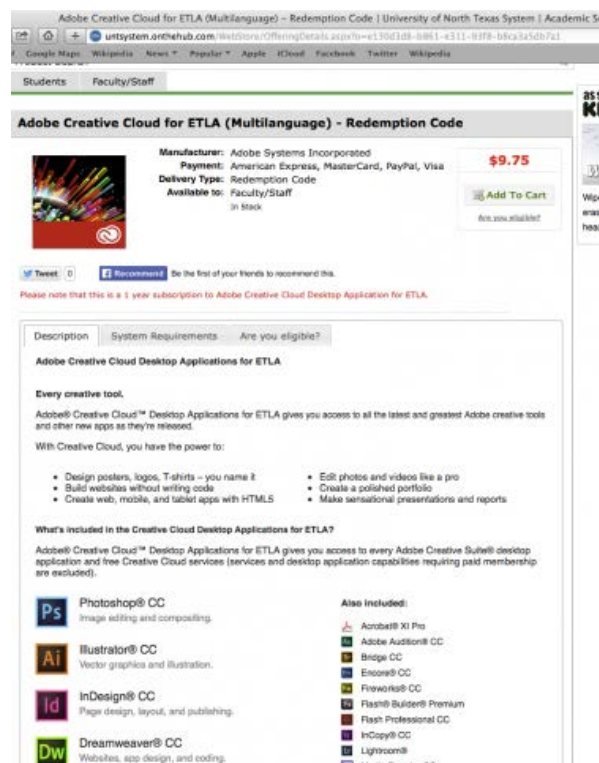
Faculty and staff pricing for Adobe Creative Cloud on the hub. Students pay $19.99 per month for Adobe Creative Cloud

Students should also remember that instead of paying the Adobe monthly rental fee, they can use these items for free (paid by their student technology fee) in nearly all of the UNT Student Computer Labs (computerlabs.unt.edu).

Students can utilize all the products described in this article for free by using the UNT Student Computer Labs

McAfee Security Solutions

All UNT community members still get free Viruscan Enterprise by downloading and installing it from the UNT anti-virus security site.

Parallels for Mac, Finale and Sibelius, and other specialty software

Parallels from Mac is no longer available at the "hub" site. The hub site has additional software discounts on a variety of products that are found by clicking on the **More Software** tab. Music students can get notation software for educational prices by going to any music supply website and looking for the "academic version" of the product (currently MakeMusic Finale 2014 is $259 and Avid Sibelius 7.5 is $295).

Statistics Software

The status and availability of various statistics applications remains the same as in my February 2014 article though some versions and prices may differ slightly. Faculty, staff and students can go to the Statistics tab on the "hub" site and also ask the Research and Statistical Support services staff, a part of UIT ACUS, for more details about statistics applications and their use. As mentioned above, statistics and mathematical applications are available in nearly all of the Student Computer Labs.

So…. this is your mid-term update on software pricing and availability for the UNT community. For the very latest news about these applications check the UIT Helpdesk Website. Happy Computing!

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Network Connection

By **Dr. Philip Baczewski**, **Senior Director of Academic Computing and User Services and Deputy Chief Information Officer for University Information Technology**

The Hits Keep on Coming

Preserving Internet security (if that's actually possible) is an ongoing process. Those of us who maintain the Internet servers that deliver information or services are charged with keeping up with the latest threats to security and responding with the best possible solutions. As we've seen recently, there are sometimes gaps in this diligence. Target stores, Home Depot, and even JP Morgan Chase have recently been in the news for allowing breaches in their systems that exposed customer credit card and/or personal information. These cases have involved tens of millions of customer transactions or accounts and it's unlikely that these kinds of reports will end any time soon.

In defense of the Internet, it was never designed to be a platform for commercial transactions. Over the years, various technologies have been layered on top of the simple HTML markup language that presents your basic web page. This lack of unified design has allowed for tremendous innovation but comes at the price of increased complexity and many "moving parts" to keep track of.

```
#!/bin/bash
```

Some of those website moving parts were recently revealed to be vulnerable to compromise and they included some of the more basic server technologies. The first of these to come to light was the alliterative Shellshock bash bug. Bash is a program that runs on Unix and Linux (and Mac OS) systems to provide a control environment when using a terminal-style connection to those systems. Since system administrators are usually the only ones that use a terminal interface, you'd think this would be a minor problem. However, the bash program is also used by web servers to initiate programs based on web requests and to send commands to the underlying operating system when needed. The bug may allow someone to send a request to the web server to arbitrarily execute a server command and provide unauthorized access to the underlying operating system.

Within hours of the announcement of the bash bug, a "fix" was released to the Internet and many system administrators immediately applied that fix to their Internet servers. Hopefully, this included many of the high-profile systems we access on a daily basis. But, since the Internet is a distributed system by design, you never know when you'll stumble onto a site that's been overlooked. And as we've seen in the cases of Target and Home Depot, just being large organizations with extensive commercial operations may not be enough to always maintain the highest levels of diligence in systems management.

Just on the heels of the Shellshock bug comes word that a long-standing technology for data encryption is also vulnerable for exploit. Secure Sockets Layer (SSL) version 3.0 was developed in 1996 as an early solution to Internet security. Most browsing is now done using newer encryption technologies, but older browsers on older operating systems may be able to exercise the SSL 3.0 vulnerability on some servers, allowing attackers to decrypt sensitive information and compromise user's Internet accounts. Unfortunately, there is no fix for SSL 3.0. So, the only solution to this problem is for servers to stop supporting the SSL 3.0 protocol. But, by using a newer browser version (like the latest Firefox), even users on older operating systems like Windows XP can protect themselves from this vulnerability.

Thank   a   System   Administrator

I can't help but put in a plug here for the unsung system administrators that help keep the Internet safe for our personal interactions and commerce. Response to these kinds of security issues is just part of the job for those that manage the servers that drive the Internet. Given what could go wrong, it's somewhat remarkable that it all keeps operating. That being said, Internet security is an ongoing concern, and there are new methods and processes for protecting it being developed on a daily basis. It is the diligence of system administrators that ensures we keep the

Internet as secure as it can possibly be.

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1155 Union Circle #310709
Denton, TX 76203 USA
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Fax: 940-565-4060

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Phishing Catch of the Day

Like their website states, the ITSS Information Security Team "helps protect the UNT System Information Technology assets from misuse, abuse, and unauthorized access." A common way for criminals to attempt to obtain sensitive personal information from people via email is through phishing. The Information Security team has established a website specifically to deal with phishing. Additionally, they maintain a "Phishing Catch of the Day" site. Viewing the site will give you a feel for what phishing looks like and will help you identify such attempts in the future. You might even recognize some malicious email you have received recently.

itss.untsystem.edu/phishing-catch-of-the-day

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University Information Technology
1155 Union Circle #310709
Denton, TX 76203 USA
Voice: 940-565-4068
Fax: 940-565-4060

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By **Jacob Flores**, **UIT Support Services Manager**

*This is an update of an article that has appeared in **Benchmarks Online** several times previously, most recently last October. October is National Cyber Security Awareness Month (NCSAM)and malware is an everpresent threat. NCSAM has been observed every year since its inception in 2004. -- Ed.*

Be Safe Out There

1) What are the most common threats or dangers that may appear on the internet? There are so many different kinds (spyware, malware, etc.) What should we be most vigilant against?

While you hear about threats being everywhere on the internet, if you use safe computing practices it can actually be a pretty safe place. Websites can distribute malware and viruses via pop-ups, harmful downloads, or outdated browser plugins. Email can contain harmful attachments or employ phishing scams in an attempt to get unwary users to release sensitive account or personal information. All of these are bad, so in a sense, you should remain vigilant against all threats. At the same time, using common sense and some safe computing practices can help you avoid these dangers.

2) How dangerous can this malicious coding be? Have we, as people, built the "virus" to be more than it is really capable of being? In other words, are we too paranoid?

Malicious coding can be very dangerous. A virus can use your computer to distribute viruses or malware to other machines, spreading just like a virus spreads between people. It can also negatively impact the usability of your machine, often "locking you out" or potentially giving others access to sensitive information on your computer. You should not live in fear of malware or viruses, but you should remain vigilant against them.

3) How can we protect ourselves from "infecting" our computers?

First think of the internet in real life terms. Should you visit with the individual offering free DVDs on the corner or should you purchase them at Best Buy? Should you give away your bank account number to someone you met on the bus or to a teller inside your bank?

Websites:

- Know what websites you are visiting. Do they seem reputable? Most major websites aren't going to be a "den of scum and villainy." On the other hand, visiting sites offering something for free that would otherwise cost money or sites you might not want your parents to know you visit could be dangerous.

- Know what you are doing on those websites. If you want to download something or click on a pop-up, read carefully and be sure you understand what the website is asking you to do. If you don't specifically know what you are asked to click on or download, don't do it.

- Be careful where you distribute information. If asked to enter in sensitive information know where and why you are doing it. If in doubt login through the main website, i.e. only enter account information after going directly to https://www.bankofamerica.com/.

- Read carefully when installing applications or accepting terms. Many installations will include a number of screens asking you to install additional software such as toolbars or other applications. Be sure to uncheck any of those boxes if you are unfamiliar with those applications. If you are ever nervous about the number of such prompts or checkboxes you see when installing an application, click cancel and do some research on the application. Some websites will also have options for you to agree to outside their terms of service. When in doubt, uncheck these boxes.

Email:

- Know who you are talking to; if communicating with an unknown sender, be more wary.

- Only download attachments from trusted sources, and avoid downloading unknown file types or executable (*.exe) files.

- Only click on links in emails from trusted senders, and never click on a suspicious link.

- Never share personal, account, or financial information that is requested via email. Instead contact the company directly to verify the request, and only make account changes by going directly to their website i.e. https://www.wellsfargo.com/.

- The above items refer to phishing emails. For more information please visit the UNT System Security Team's phishing information page: http://itss.untsystem.edu/security/phishing/.

4) I've heard that the IT department may offer **free anti-virus software** to the student body. Is this true?

Yes – in fact, UNT offers a free download of McAfee virus scan for students, faculty, and staff. This can be downloaded at http://itss.untsystem.edu/security/antivirus-download/. It is highly encouraged that if you are not currently using an up-to-date antivirus program that you install McAfee.

5) In regards to being on the campus servers, why do we need any anti-virus software, firewalls, etc.? Doesn't the IT department already take care of any sites that may be malicious?

Websites hosted by UNT should not be distributing any malware or viruses. Once you leave UNT websites, and visit websites UNT doesn't control, then you are once again open to all the risks that may exist on the internet. Even though UNT IT takes great pains to keep its users and websites secure, there is always the possibility that a phishing email could come through or a website could be compromised. No matter where you are, be sure you practice safe computing.

6) Are there any other hints, tips, or final words that you'd like to share in regards to computer behavior or usage?

Practice Defensive computing:

- Keep your computer and applications up to date by installing updates regularly and when prompted.

- Keep your firewall turned on and your anti-virus software up to date.

- Use secure and unique passwords for websites containing sensitive information; i.e. have a different password for your banking, email, and Facebook.

- When unsure about a website, pop-up, or download, choose to exit.

- Remember that phishing emails will often come from other contacts who have been compromised. Read more about phishing at http://itss.untsystem.edu/security/phishing/.

- If you feel your account has been compromised, reset your password immediately and contact technical support for that website.

- If you are prompted to provide financial information to remove a virus from your computer, contact your local IT department or computer repair shop immediately and follow their instructions.

Remember, UNT will never email you asking for passwords or other sensitive account information. If you receive such an email you can report it to the UIT Helpdesk (helpdesk@unt.edu).

For more information on keeping your computer safe, Microsoft has excellent advice in their Safety and Security Center:

http://www.microsoft.com/security/family-safety/online-safety-tips.aspx

What do I do if my UNT computer or account has been compromised?

If you feel your UNT account has been compromised please reset your password and secret question immediately at https://ams.unt.edu/, then contact the UIT Helpdesk (https://helpdesk.unt.edu/)

If you are UNT faculty or staff and feel that your University owned computer has been compromised or infected with malware, please contact your Network Manager immediately. You can find their contact information at https://helpdesk.unt.edu/netman/.

Final   Thoughts

On a final note: we live in an age of online sharing, but sometimes it's best to keep things private. In our real lives we have grown accustomed to protecting our information and we don't regularly share our address, full name, pictures, current location, or daily activities with everyone we happen to meet. It can be easy to forget this online, and while sharing can be great, it can be beneficial to be mindful of what we are sharing and with whom we are sharing it.

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Research and Statistical Support
University of North Texas

*BOO*tstrapping the Generalized Linear Model

Link to the last RSS article here:Factor Analysis with Binary items: A quick review with examples. -- Ed.

By **Dr. Richard Herrington**, **Research and Statistical Support Consultant Team**

Researchers do not need to be afraid - the availability of fast computers and public domain software libraries such as R and the R package *boot*, make forays into *bootstrap confidence interval estimation* reasonably straight forward. R package *boot* was designed to be general enough to allow the data analyst to simulate the empirical sampling distribution of most estimators (and then some), and to calculate corresponding confidence intervals for that estimator. There are a few tricks to learn when using package boot, but once those small hurdles have been navigated, the lessons learned can be applied more generally to other estimation settings.

R package boot is comprised of a set of functions that are well documented both with theory and examples in the book: *Bootstrap Methods and Their Application*, by A.C. Davison and D.V. Hinkley (1997). The purpose of this short note is to demonstrated how to approximate nonparametric confidence intervals, using resampling methods, for the *generalized linear model* (glm) using the R package *boot*.

We'll start off by simulating a data set from the following probability regression model:

```
samp.size<-5000


x1 <- rnorm(samp.size)

x2 <- rnorm(samp.size)

x3 <- rnorm(samp.size)
```

```
x4 <- rnorm(samp.size)


#    True Model
#    x0  x1    x2    x3    x4    x1*x2
z <- 1 + 2*x1 + 3*x2  + 4*x3 + 5*x4 + 10*x1*x2
pr <- 1/(1+exp(-z))
y <- rbinom(samp.size,1,pr)


> sim.data.df <- data.frame(y=y,x1=x1,x2=x2,x3=x3,x4=x4,
                   ,x5=x1*x2)

> head(sim.data.df)

  y          x1          x2          x3          x4          x5

1 0   0.9632201 -1.0871521 -2.0283342  0.5727080 -1.0471668

2 0   2.8738768 -1.4818353  0.1265646  1.9195807 -4.2586121

3 1 -0.5552309  0.8576629  1.1878977 -0.7940654 -0.4762010

4 0 -0.7519217  0.7630796 -0.7534080 -0.6768429 -0.5737761

5 0   0.6789053 -1.6454898  0.5337027 -0.9163869 -1.1171318

6 0   1.4138792 -0.3052833  1.0388294 -0.9189572 -0.4316337

.

.

.
```

Using the R function *glm* we can estimate the model coefficients using a binomial probability model for the *y* outcome variable:

```
glm.fit<-glm(y~x1+x2+x3+x4+x1*x2,

            data=sim.data.df,

            family="binomial")
glm.fit


> glm.fit
```

```
Call:  glm(formula = y ~ x1 + x2 + x3 + x4 + x1 * x2, family = "binomial",

    data = sim.data.df)


Coefficients:

(Intercept)          x1          x2          x3          x4        x1:x2

      1.009       1.973       3.101       4.081       5.113      10.144


Degrees of Freedom: 4999 Total (i.e. Null);  4994 Residual

    Null Deviance:           6910

 Residual Deviance: 1265  AIC: 1277
```

R function *glm* does a reasonably good job of recovering the population regression coefficients – although we did use a very large sample size in comparison to the number of variables in the model.

R package *caret* provides a useful helper function for displaying kernel density estimated histograms for the predictors as a function of the two level outcome variable *y*:

```
library(caret)

featurePlot(x = sim.data.df[,c(2:6)],

        y = as.factor(sim.data.df$y),

        plot = "density",

        scales = list(x = list(relation="free"),

                y = list(relation="free")),

        adjust = 1.5,

        pch = "|",

        layout = c(3, 3),

        auto.key = list(columns = 2))
```

The resulting plot is returned:
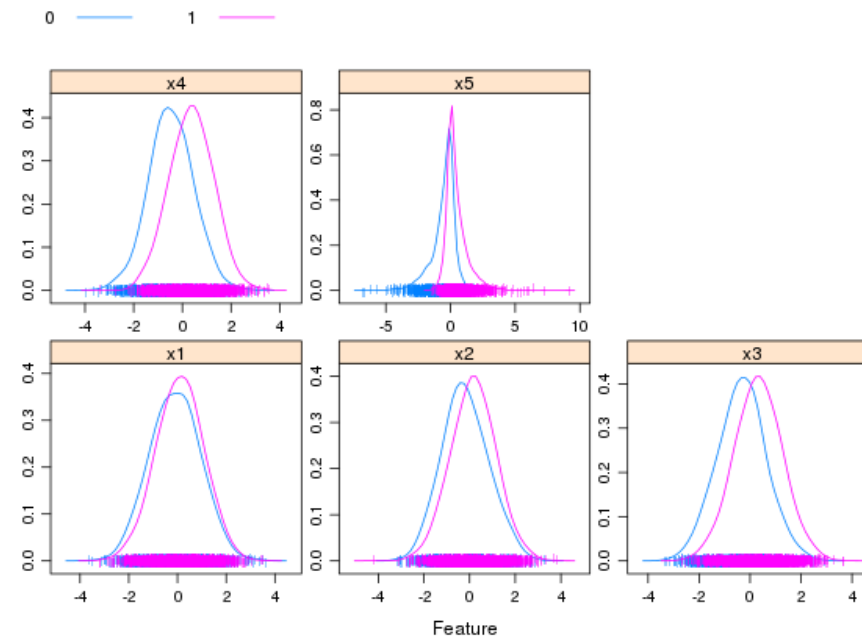
The chosen population coefficients separate the groups with a large difference between the groups (1/0) on the predictor variables.   We can calculate the marginal probabilities of the estimated predictors to see how large the average probability change is, in moving from a 50% probability of being in group 1, to the estimated probability of being in group 1, given a unit change in the predictors:

```
library(arm)

glm.coefs<-coef(glm.fit)

invlogit(glm.coefs) - .50

(Intercept)           x1          x2          x3          x4        x1:x2

  0.2327767    0.3779851   0.4569387   0.4833883   0.4940197   0.4999607
```

We have chosen very large predictor *effect sizes* for the simulation. Essentially, predictors *x4* and *x5* maximally predict the probability of *y=1* membership: knowledge of predictors x4 and x5 move our predicted marginal probability of y=1 from .50 (absent the information from *x4* and *x5*) to .99 given the information provided by *x4* and *x5*.

Now on to the bootstrap confidence intervals: first we need to create a wrapper function that will pass the resampled

data, and their corresponding indices, to the *glm* function:

```
glm.coefs<-function (dataset, index)

{

  sim.data.df<-dataset[index,]


  glm.fit <-try(glm(y~x1+x2+x3+x4, #+x1*x2,

              data=sim.data.df,

              family="binomial"), silent = TRUE)


  coefs<-try(coef(glm.fit), silent=TRUE)

  print(coefs)


  return(coefs)

}
```

The vector that contains the indices of the resampled data (*index*) will be passed to the *glm* function. Lastly, our wrapper function for glm - *glm.coefs* – will return the estimated coefficients back to the *boot* function for tabulation and post-processing. Additionally, we have used the *try* function so that if a resampled data set fails *glm* estimation, the *glm.coefs* and *boot* will not break out with error, but will instead continue with missing values for the coefficients. Lastly, we have put a print statement within the body of glm.coefs, so that we can monitor the estimated coefficients values as they are being estimated.

Our last bit of R script sends the data and glm.coefs function to boot for processing:

```
boot.fit<-boot(sim.data.df, glm.coefs, R=1000)

boot.fit


for(ii in 1:length(boot.fit$t0))

 {

 cat(rep("\n",5))

 print(names(boot.fit$t0[ii]))

 cat(rep("\n",2))

 print(boot.ci(boot.fit, conf = 0.95, type = c("norm","perc","basic"),index = ii))

 }
```

The for loop in this script isn't necessary, but is merely a short-cut for printing out the results of three different types of confidence intervals (CI) for for the six estimated parameters (intercept and x1-x6). Notice that we capture the true population parameter for each of the three CI types. This a simply a consequence of having used few predictors, an initial large sample size, and 1000 bootstrap samples in the bootstrap CI estimation.

```
> boot.fit


ORDINARY NONPARAMETRIC BOOTSTRAP



Call:

boot(data = sim.data.df, statistic = glm.coefs, R = 1000)



Bootstrap Statistics :

       original       bias     std. error

t1*   1.008756 0.007386088  0.08582566

t2*   1.973487 0.011373649  0.12787464

t3*   3.101113 0.027926437  0.15442723

t4*   4.080900 0.027597606  0.17447659

t5*   5.113291 0.036752067  0.21991954

t6* 10.144203 0.074247504  0.42935352

> for(ii in 1:length(boot.fit$t0))

+   {

+   cat(rep("\n",5))

+   print(names(boot.fit$t0[ii]))

+   cat(rep("\n",2))

+   print(boot.ci(boot.fit, conf = 0.95, type = c("norm","perc","basic"), index = ii))
```

```
+  }
```

```
[1] "(Intercept)"



BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS

Based on 1000 bootstrap replicates


CALL :

boot.ci(boot.out = boot.fit, conf = 0.95, type = c("norm", "perc",

    "basic"), index = ii)


Intervals :

Level    Normal          Basic           Percentile

95%   ( 0.833,  1.170 )   ( 0.824,  1.164 )   ( 0.854,  1.194 )

Calculations and Intervals on Original Scale


[1] "x1"



BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS

Based on 1000 bootstrap replicates


CALL :

boot.ci(boot.out = boot.fit, conf = 0.95, type = c("norm", "perc",

    "basic"), index = ii)


Intervals :

Level    Normal          Basic           Percentile

95%   ( 1.711,  2.213 )   ( 1.704,  2.191 )   ( 1.756,  2.243 )
```

Calculations and Intervals on Original Scale

```
[1] "x2"
```

BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS
Based on 1000 bootstrap replicates

CALL :
boot.ci(boot.out = boot.fit, conf = 0.95, type = c("norm", "perc",
    "basic"), index = ii)

Intervals :
Level   Normal   Basic   Percentile
95%   (2.771, 3.376)   (2.731, 3.369)   (2.833, 3.471)
Calculations and Intervals on Original Scale

```
[1] "x3"
```

BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS
Based on 1000 bootstrap replicates

CALL :
boot.ci(boot.out = boot.fit, conf = 0.95, type = c("norm", "perc",
    "basic"), index = ii)

Intervals :
Level   Normal   Basic   Percentile
95%   (3.711, 4.395)   (3.704, 4.369)   (3.793, 4.457)
Calculations and Intervals on Original Scale

```
[1] "x4"




BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS

Based on 1000 bootstrap replicates


CALL :

boot.ci(boot.out = boot.fit, conf = 0.95, type = c("norm", "perc",

    "basic"), index = ii)


Intervals :

Level      Normal              Basic            Percentile

95%   ( 4.646,  5.508 )   ( 4.621,  5.498 )   ( 4.728,  5.606 )

Calculations and Intervals on Original Scale


[1] "x1:x2"



BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS

Based on 1000 bootstrap replicates


CALL :

boot.ci(boot.out = boot.fit, conf = 0.95, type = c("norm", "perc",

    "basic"), index = ii)
```

```
Intervals :

Level       Normal            Basic           Percentile

95%    ( 9.23, 10.91 )   ( 9.15, 10.84 )   ( 9.45, 11.13 )

Calculations and Intervals on Original Scale
```

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http://it.unt.edu/benchmarks/issues/2014/10/rss-matters[4/25/16, 10:47:29 AM]

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- **Training**
- Staff Activities

Training

By Claudia Lynch, *Benchmarks Online* Editor

Do you need training on widely used computer programs including those used in statistical analysis? If so, this monthly *Benchmarks Online* column is for you.

Statistical   Analysis

Instructor-led courses are offered only by special request. Please contact an RSS member or Claudia Lynch if you are interested in taking such a class or wish to have someone offer a class for your students. **SAS**, **SPSS** and **Introduction to R** are offered online. Make sure and check out the **RSS Matters** article *Statistical Resources* in the July 2012 issue of *Benchmarks Online*.

Special classes can always be arranged with the RSS staff. Also, you can *always* contact the RSS staff for one-on-one consultation. **Please read the FAQ before requesting an appointment though.**

Especially   for   Faculty   and   Staff   Members

In addition to the online statistical courses, which are available to students, faculty, and staff, staff and faculty members can take courses offered through the Business Service Center, and the Center for Learning Enhancement, Assessment, and Redesign (CLEAR). Additionally, the Center for Achievement and Lifelong Learning (CALL) offers a variety of courses, usually for a small fee.

UNT   System   Training   Resources

Visit my.unt.edu and login to access tutorials.

🎓 UNTS Training

University of North Texas System (UNTS) Training

These tutorials provide a place to learn and practice key processes in a simulated environment. First time users should view the User Productivity Kit (UPK) player introduction before proceeding.

All Faculty & Staff

Supervisors & Administrative Staff

Additional Training Resources

Microsoft   Virtual   Academy

[Who is eligible to participate in MVA](#)?

- Anybody interested in growing their career can be a part of MVA.

- To sign up for MVA , on the [MVA home page](#), MVA courses and events are free, but you need to identify yourself using a Microsoft account in order to sign up for MVA and create your MVA profile.

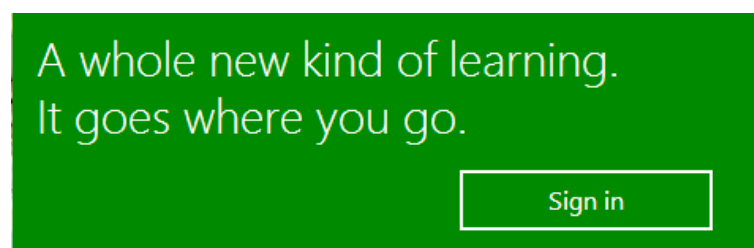- There is no minimum level of technical expertise required.

Microsoft   E-Learning

Microsoft E-Learning courses are available for faculty, staff, and students via our UNT System Microsoft Campus Agreement. **Instructions for accessing Microsft E-Learning have recently changed.**

Follow the instructions below to access E-learning until you arrive on the "UNT System authenticated service Page."

- Go to: https://onlinelearning.microsoft.com

- Click **Sign In**:

- A whole new kind of learning. It goes where you go. Sign in

- Then choose:

  Organizational account
  Sign in with the account provided by your work or school to use with Office 365 or other Microsoft services.

- You will be taken to the following sign in page:

  Sign in with your organizational account

  someone@example.com

- Fill in your UNT email address on the sign in page and press the "Sign In" tab.

- You will be taken to the UNT System authenticated service Page:

- To login using **Integrated Authentication**, click on that link and type **UNT\EUID** where **EUID** is *your* EUID. This should take you to the UNT courses that are available. If you are using Internet Explorer the following box will appear and you should enter your EUID where it says "Username."

- Once signed in, you should be able to access the courses that are available to the UNT community.

- You can access courses available to the general public by choosing the Microsoft Account option:

- If you do not currently have a Microsoft account (previously called a "Live ID") you can create one at Microsoft's Live Sign-up site.

Microsoft   E-books

Click on the link and access the largest collection of FREE Microsoft eBooks ever, including: Windows 8.1, Windows 8, Windows 7, Office 2013, Office 365, Office 2010, SharePoint 2013, Dynamics CRM, PowerShell, Exchange Server, Lync 2013, System Center, Azure, Cloud, SQL Server, and much more!

Central   Web   Support

Central Web Support provides "web hosting and support to appropriate campus entities free of charge." Visit their website for "How-Tos about Everything."

CLEAR

CLEAR offers courses especially for Faculty Members. *CLEAR training includes:*

- Blackboard

- Turnitin

- Turning Point

- Assessment

- Teaching Effectiveness

- Respondus

Please check out CLEAR's training and event calendar at http://clear.unt.edu/calendar for the latest information regarding Blackboard, CLEAR's initiatives, and on campus instructional events.

Further information can be found here.

FREE Online Learning Consortium Workshops

The University of North Texas is a premium member of the Online Learning Consortium (formerly the Sloan Consortium) College Pass. To request FREE ENROLLMENT in an Online Learning Consortium workshop, please contact Amber Bryant with the name and date of the workshop selected.

- Online Consortium 2014 Workshops

Please click on the link above to see the available 2014 workshops.

Ed2go

Ed2go are courses that are offered, for a fee, to UNT faculty, staff and students as well as the general public. According to the CALL website:

CALL has partnered up to provide online learning on a variety of topics. From standardized test preparation to database programming to training for libraries and their staff, there's a variety of areas from which to choose in online learning.

The online minicourses, provided in conjunction with Ed2go, are standardized 12-lesson modules released over a six week period. (Courses are active for eight weeks to provide some flexibility). Each module features a quiz. Lessons are instructor-led and course participants and instructor communicate through a course discussion board. Lessons can be downloaded and saved. At the end of the course there is a final quiz. A passing grade opens a window that allows students to print out a course completion certificate.

Most courses are $89, and UNT faculty, staff and students may receive a $10 discount. Visit the online courses page at http://www.ed2go.com/unt/ or contact Tami Russell at 940.565.3353 for more information.

For additional information, visit the **Ed2go blog** here. You can subscribe to their newsletter also from a link at the bottom of the page.

Information Security Awareness

Information Security Awareness -- The ITSS Information Security team offers Information Security Awareness training to all UNT faculty and staff.

- It is a policy requirement that ALL staff take an information security course at least once a year.

- See the Virus Information Page and the Information Security Handbook -- for Faculty, Staff and Students for further information.

UNT HR Training and Development

As noted on their website:

Monthly emails are sent to all employees with a list of current classes, many available by webcast. (Note: Few, if

any classes are offered during the winter break, spring break holiday periods for all UNT System campuses.)

Learn more about classes here:https://untranet.unt.edu/untsystem/UNT%20System%20HR/talent_management/SitePages/Home.aspx

If you have questions or specific needs, contact talentmanagement@untsystem.edu or call 855-878-7650 to be directed to a Talent Management staff member.

Alternate Forms of Training

Many of the General Access Labs around campus have tutorials installed on their computers. See http://computerlabs.unt.edu/ for a list of labs and their locations. The 24 Center in Willis Library, for example, has a list of Tutorials and Software Support. The Library Instructional Unit also offers workshops and training, including "tech skills" training. Visit their websites for more information: http://www.library.unt.edu/library-instruction.

Info~Tech, UNT's IT Research Partner

Info~Tech is UNT's IT research partner. UNT System, UNT, UNT Health Science Center and UNT Dallas employees have access to Info~Tech research at: www.infotech.unt.edu (click on the UNT System name to login). Your standard EUID and Password gains you access to the Info~Tech system. Please take a moment to read their terms and conditions by clicking through the agreement when you set up your profile the first time you log in.

State of Texas Department of Information Resources

Another possible source of training for staff and, perhaps, faculty members is the Texas Department of Information Resources. A look at their Education and Training website reveals some interesting possibilities.

New Horizons Computer Learning Centers

New Horizons is a DIR vendor, which means that state agencies, like UNT, get special pricing for their services negotiated at the State level (click here for more information about DIR vendors). New Horizons offers courses at their own facilities in Dallas and Fort Worth, but will arrange for onsite training as well. They have a "Tips and Tricks" page that has helpful information. You can also join their mailing list to receive their monthly newsletter, event invitations and specials.

EDUCAUSE Live! Webinars

EDUCAUSE Live! is a series of **free**, hour-long interactive webinars on critical information technology topics in higher education. You can register for upcoming webinars and you can find recordings of **all past webinars** in the *EDUCAUSE Live!*archives.

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Staff Activities

Staff activities for UIT are reported in this column.

Changes, Awards, Recognition, Publications, etc.

- **John Hooper**, Vice Provost for Information Technology and UNT's Chief Information Officer, retired September 30. He has recently returned to campus to work part-time on an advising notes technology project.

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Access Resources from the EDUCAUSE Annual Conference

By Claudia Lynch, *Benchmarks Online* **Editor**

The conference is over but you can still access resources from EDUCAUSE 2014.

EDUCAUSE 2014
ANNUAL CONFERENCE

September 29–October 2, 2014 | Orlando, Florida and Online

A recent "EDUCAUSE At a Glance" email message states:

You can now access speaker presentation materials from this year's annual conference by clicking on the session name in the face-to-face or virtual conference daily agendas. Additional resources are also available:

- See photos of the infographics featured throughout the conference with trends and predictions on the future from ECAR, ELI, CDS, and other sources

- See what your peers predicted about the future by viewing photos of the "Design the Digital Future" wall of ideas

Watch the free public webcasts

Ongoing   ...

*EDUCAUSE   Live!*Webinars

EDUCAUSE Live! is a series of **free**, hour-long interactive webinars on critical information technology topics in higher education. You can register for upcoming webinars and you can find recordings of **all past webinars** in the *EDUCAUSE Live!*archives.

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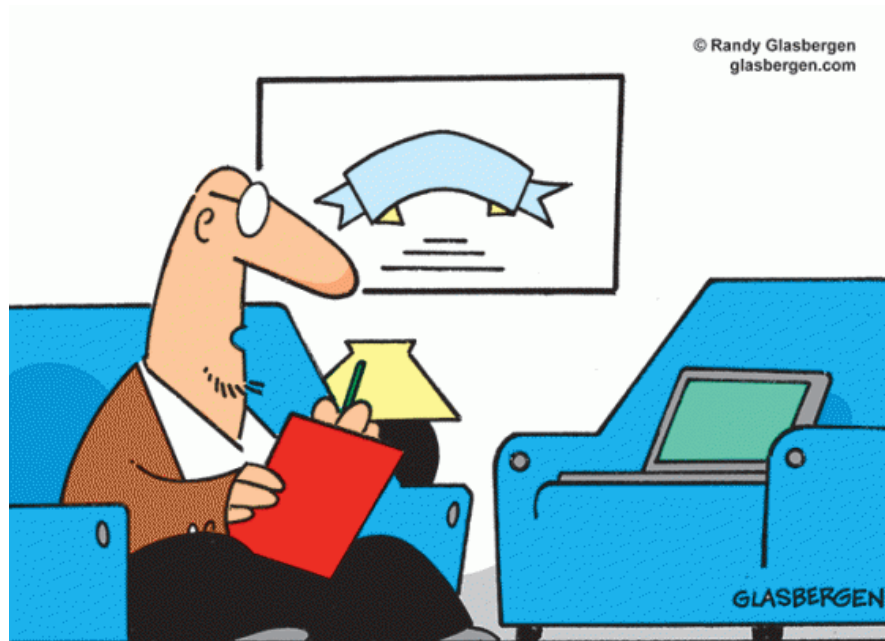
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Today's Cartoon

© Randy Glasbergen
glasbergen.com

GLASBERGEN

"It's not just you. We're all insecure in one way or another."

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For many more cartoons, please visit www.glasbergen.com.

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