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Campus Computing News



It's Official, UNT Has a New Wireless Website!

By [Rory Rivoire](#), Wireless Systems Integrator, University of North Texas System

In order to try to keep up with ever changing technology and provide a good line of communication with our students, staff, and faculty, we have published a new official website for all things wireless. One of our biggest challenges has been to provide accurate and timely information regarding changes, updates, notifications, etc. for the campus wireless network.

[Read more](#)

Google Docs and Phishing Alert



UNT System IT Shared Services recently announced that certain kinds of e-mail messages will be subject to quarantine, in particular, messages that contain a Google Doc link. According to a message from System CIO Michael DiPaolo, "These emails are being quarantined because of an increase in phishing attacks using Google Docs."

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New Computer Kiosks Available in Sage Hall



By [Dr. Elizabeth Hinkle-Turner](#), Director - Academic Computing Technical Service

Academic Computing and User Services (ACUS) is now providing 12 computer kiosks in Sage Hall. Kiosks were popular in the building when it housed the College of Business and ACUS has expanded on the original kiosk offerings.

[Read more](#)

UNT Personal Web Page Server Termination

By the Numbers

Down the Corridor of Years

- **1983** -- Began implementation of Student Information Management System (SIMS). SPSS-X installed. [HP2680A laser printer](#) capable of printing 45 pages per minute installed. Eight metro lines installed.
- Sixty-four terminals installed on the 5th floor of the GAB and in the BA.
- Twenty-four terminals replaced the IBM 029 keypunch machines in the ISB. The Sytek local area network became operational as one of the first campus broadband data communication systems nationwide.
- **1984** -- OS/MVS/JES2 operating system replaced OS/MVT on AS/8040 and AS/6650. Four megabytes of memory added to the academic AS/8040 bringing the total capacity to twelve megabytes.
- **1985** -- NTSU became node in the [Tager microwave network](#). Human Resources Management Information (HRMIS) project begun. (City power outages result in [UPS battery fire in the GAB](#).) AS/8040 upgraded to sixteen megabytes of main memory, making it an AS/8043. NTSU became a [BITNET](#) site.
- **1986** -- VAX 11/780s upgraded to 785s and configured into a cluster. Graphics Lab opened in



By [Dr. Philip Baczewski](#), Senior Director of Academic Computing and User Services and Deputy Chief Information Officer for University Information Technology

The personal web page site, **people.unt.edu**, will be shut down as of May 31, 2013. This service has not kept pace with contemporary developments in web publishing, so it will be retired in favor of some new services to be announced at a later date. UNT students or employees who still maintain information on people.unt.edu should download and save a local copy as soon as possible.

[Read more](#)

ITSS Quarterly Newsletter



By [Claudia Lynch](#), *Benchmarks* Online Editor

Issue 2 (January 2013) of the *ITSS Quarterly Newsletter* is now available. It is comprised of IT-related news relevant to anyone who uses or has an interest in shared services and applications throughout the UNT System and its member institutions.

[Read more](#)

TODAY'S CARTOON

Click on the link above for an information age laugh.



the basement of the ISB. NAS/8043 upgraded to a dual processor NAS/8083, increasing academic CPU power 80% and administrative CPU power 211%. Key punch machines replaced with microcomputers in the Data Entry section of the Computing Center. HP-2000 moved to the Physics Department.

- 1987 -- HP-2680A laser printer installed in the BA. NTSU joined TEXNET.



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In order to try to keep up with ever changing technology and provide a good line of communication with our students, staff, and faculty, we have published a new official website for all things wireless. One of our biggest challenges has been to provide accurate and timely information regarding changes, updates, notifications, etc. for the campus wireless network. A quick search on the www.unt.edu website for wireless, pulls up a number of pages that are outdated and are inaccurate for our current wireless implementation. The campus wireless system is in a state of change and we need to announce changes and notifications to the campus at large. The only way to do this is to publish a single website with the current and accurate information for those changes.

Many people across the campus, especially those working in the [Distributed IT Support Groups](#), have helped us in the past to troubleshoot various issues, tested many devices which we did not have available to us, and published information that was of great benefit to the campus. Unfortunately, since we have made many changes, we now have multiple websites with outdated information or inaccurate details for configuration of devices. In order to eliminate this problem in the future, we ask that you henceforth link to the following page which is now the official UNT wireless web page:

<http://itss.untssystem.edu/services/data-communications/untssystem-wireless-networking>

UNT|System Wireless Networking

General Information

The Information Technology Shared Services department supports an extensive wireless network that includes the UNT Denton, UNT Dallas, and downtown Dallas locations. The UNT|System enterprise wireless network accepts 802.11a/b/g/n client standards in the 2.4 and 5 GHz range, as well as WPA2-Enterprise security with AES encryption and RADIUS authentication. The network utilizes state-of-the-art wireless access points capable of handling speeds in excess of 100 Mbps; however, your actual speed and system throughput will vary depending on your location in a building, the number of other people using the network, and the type of equipment you are using.

The establishment of this site was done according to [UNT Web Publishing Policy \(3.9\)](#). Under the section titled "Structure of the University Web" the text states:

"Any UNT Web document may provide access to any official UNT information that is on the Web, but this should be accomplished by a link to the information, rather than a duplicate copy of that information. In other words, managers of Web documents should not duplicate information that they do not manage, but instead should refer the reader to the original copy."

I would like to thank my new associate, **Sean Martin**, for setting up and maintaining this website. Sean comes to us with a background of wireless. He was instrumental in the build out of Pagenet, which some of you may remember

was a main method of communication before the smart phone era. Sean has proven himself to be very knowledgeable and personable in the short time he has been here. I look forward to working with him over the coming years.

I would also like to thank **Tom Delozier** and **Yancey Yeargan** for all of their hard work put into the Ldap and radius authentication systems which we use for wireless as well as the implementation of eduroam.

A shout out also goes to **Mac Edwards** of the UIT Helpdesk and all of the **Helpdesk staff** for all of their support, troubleshooting assistance, and documentation. Thanks to all of you for your support and feedback!



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Google Docs and Phishing Alert

UNT System IT Shared Services recently announced that certain kinds of e-mail messages will be subject to quarantine, in particular, messages that contain a Google Doc link. According to a message from System CIO Michael DiPaolo, "These emails are being quarantined because of an increase in phishing attacks using Google Docs." Phishing is defined as someone sending a deceptive email designed to fool the email recipient into submitting personal, financial, or password information. In these phishing attacks, if someone responds to the Google Docs link, it gives an attacker access to your email account which they may use for inappropriate purposes as well as access to other systems that share the same credentials at UNT."

If an e-mail addressed to you is quarantined, you will receive the subject "Email Quarantined Due to Security Concerns." According to the announcement, "You can go to the quarantine site – [spam.unt.edu](#) – examine the email and, if you are confident it is legitimate, you have two possible actions:

- Release - the email will be released from quarantine and delivered to your mailbox.
- Release and Add to Safelist - the email will be released from quarantine, delivered to your mailbox, and future emails from this sender will not be quarantined."

Quarantined email that is not subjected to the above actions will be deleted after 30 days. If you have questions regarding quarantined email, you can contact the UIT Help Desk at (940) 565-2324 or helpdesk@unt.edu.

Phishing, spam and scam messages increasing

The Information Security team and the Messaging and Directory Services teams in IT Shared Services (ITSS) have seen an increase in the number of phishing attacks targeted at UNT System institutions. Numerous campaigns to identify and stop rogue emails targeted at students, faculty and staff have been successful; however, phishing attacks have become more sophisticated recently. Since the beginning of the academic year, at least a dozen compromised accounts have been identified. Proactive measures like the Google Doc quarantines are being taken by ITSS to reduce the number of phishing, spam and scam messages that reach your email account. The best defense, however, is to educate yourself on how to recognize phishing messages.

Remember, when an attacker gains access to your enterprise account, they have the potential to access all your records, destroy or download email in your account, and send out email in your name to everyone in your address list.

For more information about phishing scams, see <http://security.unt.edu/phishing>. For help searching your spam folder see: <http://itss.untsystem.edu/services/messaging/searching-your-spam-folder>.



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New Computer Kiosks Available in Sage Hall

By [Dr. Elizabeth Hinkle-Turner](#), Director - **Academic Computing Technical Service**

Academic Computing and User Services (ACUS) is now providing 12 computer kiosks in Sage Hall. Kiosks were popular in the building when it housed the College of Business and ACUS has expanded on the original kiosk offerings. Eight of the kiosks are located in the same place they were formerly - the first floor hallway:



Eight of the kiosks are in the same place as the old COB kiosks - in the first floor hallway
A second set of four kiosks is located in the first floor learning commons area:



Another four kiosks are located in the first floor learning commons

The kiosks were developed by Richard Sanzone and Yonathan Khoe of ACUS and are managed under the auspices of the ACUS/Adaptive General Access Computer Lab. Sanzone and Khoe share the configuration and key features of the machines:

- 12 kiosks: 4 in the Learning Commons, 8 in the first floor hallway
- 2 accessibility-height stations at each location
- Managed by the ACUS Adaptive Lab
- Authentication via iCheckin for any current student or employee
- 21" iMacs
- Mac OSX Lion
- Chrome
- Firefox
- Safari
- Adobe Acrobat Reader for PDF documents
- Unarchiver zip file utility

Patrons utilizing the hallway kiosks will soon also get to enjoy a new media artwork by UNT graduate student Andrew Blanton which will be installed near the kiosks. A generative work, the Blanton piece will feature line art which changes in density and character based on noise data gathered in the hallway. The piece should offer a wonderful and compelling addition to the kiosk area. Patrons using the kiosks in the learning commons area will continue to enjoy the comfortable and functional furniture and study spaces near the machines making the commons an even more flexible and useful work area.

Patrons of Sage Hall can now easily stop and check their email, review online notes before a test, catch up with friends on Facebook, or do any number of other quick digital tasks in between classes and meetings in the building. Use of these kiosks is highly encouraged; greater use means the very real possibility of more kiosks being installed in other high volume areas of the building such as near the third floor classrooms and Testing Center. For more information about the kiosks and the other services offered by the ACUS Adaptive General Access Computer Lab and its staff, please visit www.unt.edu/ACSGAL.





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UNT Personal Web Page Server Termination

By [Dr. Phillip Baczewski](#), Senior Director of Academic Computing and User Services and Deputy Chief Information Officer for University Information Technology

The personal web page site, [people.unt.edu](#), will be shut down as of May 31, 2013. This service has not kept pace with contemporary developments in web publishing, so it will be retired in favor of some new services to be announced at a later date. UNT students or employees who still maintain information on [people.unt.edu](#) should download and save a local copy as soon as possible.

Personal web page publishing was first supported by Academic Computing Services in the Summer of 1995 on the general-purpose Unix system known as "Jove". By 1997, web page publishing was part of the Computing and Information Technology Center's UNT Internet Service and was later moved to a server dedicated just to personal web page publishing. However, the operating environment has not kept up with current information needs, and the generous 10MB quota established years ago no longer seems appropriate for today's volume of online information.

The [people.unt.edu](#) system was always intended as only personal web publishing and should not be serving any official UNT content. Analysis of recent web page activity on [people.unt.edu](#) shows that the pages accessed belong to only 45 different individuals. However, to avoid any disruption of the current academic semester, we will wait until May 31 to perform the shut down. But, given the age of the current hardware, there is no guaranty that the system will stay operational through that time, so it is important for individuals to retrieve, in a timely manner, any information they wish to preserve.

Plans are in progress to present an alternative student web publishing service that should be available before the [people.unt.edu](#) shutdown. There are also many freely available commercial sites that can provide a platform for personal web publishing. (http://www.ehow.com/how_4814236_publish-web-site-free.html) Given the low usage and other alternatives, it is likely that the [people.unt.edu](#) web server will not be missed, however, it has had a remarkable run servicing the UNT community over the years.

Those who need help in downloading their web files from [people.unt.edu](#) can contact the UIT Help Desk at (940) 565-2324 or helpdesk@unt.edu. Any questions regarding this service may also be directed to the Help Desk.



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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

Cyberspace is Becoming a Rough Neighborhood

If you follow news accounts, you might think that the Internet is becoming a scary place. News of *cyberattacks* seems to be a daily occurrence and the language of war seems to be creeping into the day-to-day discourse regarding online activity. Are we still free to feel safe and secure within our own personal computers?

Cyber Attacks, Offensive and Defensive

Last fall saw a number of banks being the target of massive [denial of service \(DOS\) attacks](#). Bank of America was the first target, but Chase, Wells Fargo, and U.S. Bank were reported to be targets as well. DOS attacks are frequently a method used to protest some company or organization's behavior by a community of individuals sometimes labeled "hactivists." It's not clear in these cases whether this was protest activity or an attempt by an external threat to generally disrupt the U.S. banking system. The effect to the average consumer might be the cyberspace equivalent to a bunch of folks picketing a physical location. It's a temporary inconvenience that usually gets resolved, but keeps you from accessing a resource (like a banking transaction) while the activity is underway. But if the Bank or their network infrastructure provider can't resolve a DOS attack, our newfound dependency on online banking could make this type of activity a major disruption.

More recently, the news broke that hackers, reportedly Chinese, have [targeted](#) the New York Times and other U.S. publications and infiltrated their computer systems. According to the New York Times, the software used to gain unauthorized access was "associated with computer attacks originating in China." Attacks against the computers of the [Washington Post](#) have also been suspected of originating in China.

News also comes recently that the Pentagon is [pursuing a plan](#) to increase the number of troops and civilians that make up the U.S. Department of Defense's Cyber Command. Their mission will be to project computer systems that operate critical infrastructure such as electric grids and power plants, plan attacks abroad, and protect the Department of Defense networks. President Obama also recently signed an [executive order](#) directing federal agencies to improve information sharing on "cyber threats." The issue of cybersecurity even received a mention in the President's 2013 State of the Union address.

What can you do?

So, if you haven't already yanked the network cable out of your computer in fear, you are still able to read this and may be wondering what steps you might take to protect your online resources in this increasingly dangerous (apparently) cyber environment. We might find some answers looking at the main causes of online security breaches. In 2011, an Australian publication named [CSO Online](#) identified three [top causes](#) of security breaches: [SQL injection](#) (not much we can do about that), sloppy password practices (a little closer to home), and social engineering (they don't mean "us", do they?). Other sources claim that [employees](#) are the major reason for security breaches. In the immortal words of Pogo, "[We have met the enemy and he is us.](#)"

Passwords can be an easy lock to pick for those determined to gain access to protected systems. Passwords are a problem when they are weak. A password that is a common word can easily be reverse engineered. The most common password used by many people on different computer systems may actually be "password". Passwords that contain a combination of upper and lower case letters, numbers, and punctuation are generally the most secure, especially if they don't directly represent a dictionary word (like taking the first letter from each word in a phrase), and longer is generally better. Secure passwords may be more difficult to remember, but are one good defense against an online breach. Another bad password practice is using the same password on personal as well as business accounts. Some commercial services can be easy targets for password discovery. You don't want the discovery of

your Facebook password to lead to a break-in on your computer at work.

The most prevalent method of social engineering right now is called [phishing](#). Usually phishing takes the form of "fake" e-mail messages or web sites that try to fool you into giving up your ID, password, or other information such as a bank account or credit card number. For example, you may get an e-mail that says, "There's a problem with your XYZ account -- log in here to fix it." "Here" is probably a web site that looks like a service you may frequently use, but is actually there just to get your information. You enter your ID and password and it pretends to accept your login, but in reality you've just given one or more strangers access to your e-mail, bank account, or whatever that service purported to be. (Worse, you may have just given them your credit card number.) Careful attention the network address should alert you that this is not really your bank's site, but often, we aren't paying careful enough attention as we are interacting with the online world.

You may be saying, "I can't access anything important at work" or "let's see if *they* can find any money in my account." But, often times what a cyber intruder is wanting is a platform to launch their next and bigger attack, and you may have just provided a resource by maintaining an insecure password or falling prey to a phishing attempt (unfortunately, this happens more frequently than you'd think.) Lest you think that we are somehow more secure in higher education, in the New York Times [incidents](#) "the attacks started from the same *university computers* used by the Chinese military to attack United States military contractors in the past." (Ouch.)

Be Proactive!

Michael Lind recently wrote a piece for Salon entitled, "[Stop pretending cyberspace exists](#)". He contends that, "*There is no such place as cyberspace*. It is not a parallel universe, coexisting with our world but in a different dimension. It is just a bad metaphor that has outlived its usefulness." He points out that when you are using the Internet, you are not travelling in cyberspace, but rather sitting at your computer somewhere in the world where there is some kind of local jurisdiction (i.e. your city or state.) The point to take away here is that while the Internet is world wide, usage is local. For the sake of this discussion, it may mean that we should not depend on cyberwarriors to protect us in cyberspace, when all we might need to do is be sure that we keep a good lock on the virtual door and stay out of some of those virtual dark alleys.

Cyber security is not solely the government's responsibility, but rather each of our individual responsibilities as well. It's been [said](#), "The price of freedom is eternal vigilance." The preceding part of the original quote is, "It is the common fate of the indolent to see their rights become a prey to the active." Individuals can be vigilant in their interaction with online resources or they may find that those resources will be taken from them. Complex password, or government control of the Internet? You decide.



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UNT|System Wireless Networking

The "Campus Computing News" [article](#) this month focuses on the new wireless website that replaces all previous websites on that topic and is the official wireless site for UNT Denton, UNT Dallas, and the UNT Systems' downtown Dallas locations. Visit the site for general information about UNT's wireless network, installation and configuration requirements for connecting to the network, troubleshooting tips, and more:

<http://itss.untsystem.edu/services/data-communications/untsystem-wireless-networking>



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Helpdesk FYI

By [Jonathan "Mac" Edwards](#), CITC Helpdesk Manager

UNT Bulk Mail Message Types

EagleConnect is the official email account for UNT students. One concern we hear at the UIT Helpdesk from students is that they receive so many different types of email from UNT, and other sources, it can be easy to overlook the important ones. Using filters in EagleConnect can be a great way to keep track of important emails.

Mail sent from the University Bulk Mail system will use the following key words in the subject line:

"UNT Official Message:" for UNT official notices and announcements

"UNT Announcement:" for general announcements and event notifications

"UNT Course Info:" for course-related information from professors

Creating Rules

To create a rule to organize Bulk Mail messages, or other emails, use the following steps:

1. Log into EagleConnect at <http://eagleconnect.unt.edu>.
2. On the right side of your screen choose **Options**.
3. From the drop-down menu select **Create an Inbox Rule**.
4. From the **Inbox Rules** section click on **New**.
5. From the "When the message arrives, and" section choose **It includes these words in the subject...** from the dropdown menu.
6. A window will appear. Type in the specific phrase you want to filter on. For this example we will use "UNT Announcement:"
7. After entering in your phrase click the plus + sign, and then click OK. If you wish to add more values simply enter them in and use the + sign to add them to your list.
8. Under the "Do the following:" section, choose what you would like to do with the message. For our example we will **Move the message to folder...**
9. After choose **Move the message to folder...** click on the ***Select one...** option.
10. If you have previously created a Folder you wish to use select it now, otherwise use the **New Folder** option. For our example I will click on New Folder and label it **Announcement**. Then click OK.
11. Choose **Save**.

Messages that contain "UNT Announcement" in the subject line should be directed to your **Announcement** folder.

You can create similar rules for the other UNT Bulk Mail categories (listed above).

Advance/More Options

In the New Rule dialog box you may note that there is a **More Options** section. Clicking on this will open the New Inbox Rule section with a number of options for creating advanced rule sets. A more thorough description of advanced rules can be found on the Microsoft website <http://help.outlook.com/en->

[us/exchangelabshelp/bb899620.aspx](http://it.unt.edu/exchangelabshelp/bb899620.aspx).



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RSS Matters

Research and Statistical Support University of North Texas

Model Specification Error...Are you straight, or do you have curves?*

Link to the last RSS article here: [Using R packages "ff" and "filehash" to Handle Big Data](#). -- Ed.

By [Dr. Jon Starkweather](#), Research and Statistical Support Consultant

The fact is; most of us have curves, even if we don't want to acknowledge them. Model specification error generally refers to errors of omission and errors of inclusion, meaning: omitting crucial variables from the model or entering useless variables into the model. However, model specification error, or model misspecification, can also refer to the model *form* imposed on the data (e.g. *general linear* model). The purpose of this month's article is to show how specification of different models to the same data can lead to meaningful differences in the interpretation of inferential analysis. The example provided is a very simple bivariate regression with an exaggerated pattern of data points. It is important to note that this example is simple and exaggerated specifically to illustrate how choice of model can make a difference in the results of an analysis. It is worth noting at the outset that with larger, more complex data which may contain less exaggerated patterns and indeed difficult to identify patterns, specification of the most appropriate model can become very important. These points are mentioned because when contemplating any type of model fitting analysis, one is expected to do a thorough job of exploring one's data to discover the underlying relationships between variables of interest. During the process of initial data analysis one will likely discover the underlying pattern(s) in the data and proceed with the appropriate type of model. All of what follows can be duplicated in IBM SPSS 20.

The current example utilizes two variables (x & y) each containing 30 data points ($n = 30$). The x variable is our predictor and the y variable is our outcome. If we apply a common **linear** regression

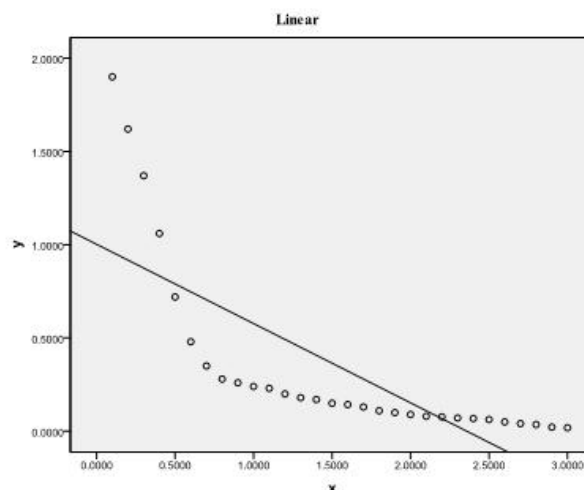
$$(1) \quad y = bx + a$$

analysis to our data, as is often the default; we find a strong negative correlation ($r = -.759, p < .001$). The model summary table would show a moderate effect size or amount of variance accounted for ($\text{Adj. } R^2 = .561$) and our ubiquitous ANOVA table would indicate that this model's R^2 is significantly different from zero; or stated another way, this model is better than simply using the mean value of x to predict new y scores, $F(1, 28) = 38.043, p < .001$. Remember, linear regression represents a *straight* line; it can increase, decrease, or remain flat—which would indicate no relationship between the two variables. At this point, we might be inclined to call it a day and be sufficiently satisfied with ourselves and our analysis. We could say our model does a fairly good job and provides us with a decent effect size (R^2) which indicates that we could predict with reasonable accuracy using our **linear** model:

$$(2) \quad y = -.425x + 1.002$$

	x	y	
1	1000	19000	
2	2000	16200	
3	3000	13700	
4	4000	10600	
5	5000	7200	
6	6000	4800	
7	7000	3500	
8	8000	2600	
9	9000	2600	
10	10000	2400	
11	11000	2300	
12	12000	2000	
13	13000	1800	
14	14000	1700	
15	15000	1500	
16	16000	1430	
17	17000	1300	
18	18000	1100	
19	19000	1000	
20	20000	0900	
21	21000	0900	
22	22000	0770	
23	23000	0710	
24	24000	0680	
25	25000	0630	
26	26000	0500	
27	27000	0410	
28	28000	0360	
29	29000	0220	
30	30000	0190	

However, this would be precisely the pitfall this article is designed to illuminate. As we will see, there are a few other models that better characterize this data. For instance, if we simply view a scatter plot with our **linear** best fit regression line, we see clearly there may be other models more appropriate for this data.



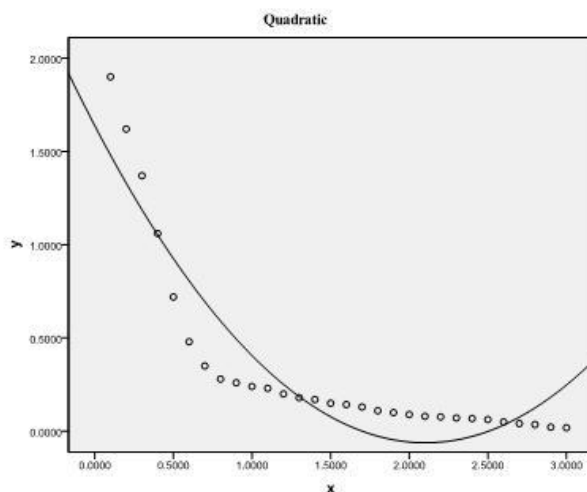
So, you may ask yourself “how do I better characterize the data?” And, after looking at the scatter plot above, you may tell yourself “a **quadratic** model would fit this data better.” If we apply a **quadratic** regression

$$(3) \quad y = b_1x^2 + b_2x + a$$

to our data, we find a distinct and meaningful increase in our effect size ($Adj. R^2 = .847$) as well as an increase in our F value from the ANOVA table, $F(2, 27) = 81.397, p < .001$; in fact the F value more than doubled. A quadratic regression represents a parabola, which can increase then decrease or decrease then increase. So, let’s take a look at the scatter plot again, this time with a line representing our **quadratic** equation

$$(4) \quad y = .384x^2 + -1.617x + 1.638$$

overlaying our data points.



Once again, we might now raise our chin and proclaim we have done a good job of modeling our data. After all, we’ve seen a substantial increase in our R^2 , our F value, and we can see in this scatter plot that our model (represented as the line) better fits the data points.

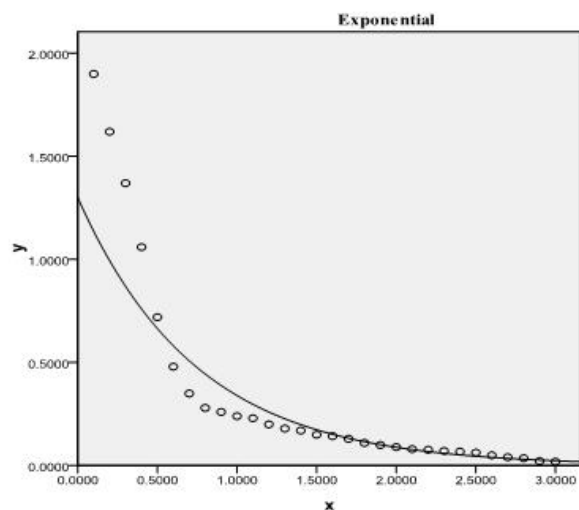
However, being the conscientious folks we are as data analysts and after having seen the differences we have thus far; we might be curious to see if we can find another model that better fits our data. So, if we apply an **exponential** regression

$$(5) \quad y = b^x + a$$

to our data, we find a further improvement in our effect size ($Adj. R^2 = .948$). And with the **exponential** regression, we see our F value growing to enormous proportions, $F(1, 28) = 525.869, p < .001$. An **exponential** regression uses the predictor as an exponent and presents a line that can steeply increase or steeply decrease. So, let’s take another look at the scatter plot; this time with our **exponential** equation

$$(6) \quad y = -1.341^x + 1.300$$

best fit line overlaying our data points.



Finally, we can stand up and speak with confidence that we have found an appropriate model for our data which accounts for 95% of the variance and fits our data very well. However, we may still be able to improve upon this with the application of yet another model.

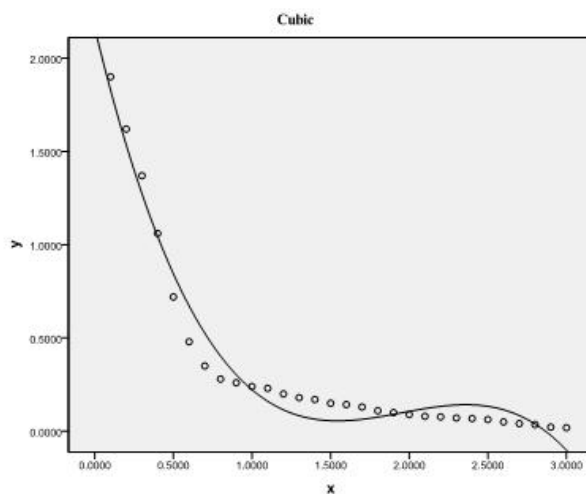
So, if we apply a **cubic** regression

$$(7) \quad y = b_1x^3 + b_2x^2 + b_3x + a$$

to our data, we find a slightly higher effect size (Adj. $R^2 = .965$) and a slightly smaller (but still massive) F value, $F(3, 26) = 269.732, p < .001$. A **cubic** regression can steeply increase, steeply decrease, increase then decrease, or decrease then increase. If we use our **cubic** regression line

$$(8) \quad y = -.319x^3 + 1.868x^2 + -.3486x + 2.160$$

to graphically display our model's fit on the data in a scatter plot, then we can see it fits slightly better than the previous model.



It appears as though we have squeezed every ounce of R^2 from our data as possible. However, there are other types of models; even for regression in IBM SPSS 20—such as Logarithmic, Inverse, Power, Compound, S, Logistic, and Growth. For a comparison of each; one can utilize the 'Curve Estimation...' function in IBM SPSS 20 by clicking on --> Analyze --> Regression --> Curve Estimation... just remember it may be beneficial to click on the 'Display ANOVA table' box in the 'Curve Estimation' dialog box. Clicking that box will show the model summary table, ANOVA summary table and coefficients table for each type of model being compared. Without checking that box, one gets a global 'Model Summary and Parameter Estimates' table such as this:

Model Summary and Parameter Estimates

Dependent Variable: y

Equation	Model Summary					Parameter Estimates			
	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Linear	.576	38.043	1	28	.000	1.002	-.425		
Quadratic	.858	81.397	2	27	.000	1.638	-1.617	.384	
Cubic	.969	269.732	3	26	.000	2.160	-3.486	1.868	-.319
Exponential	.949	525.869	1	28	.000	1.300	-1.341		

The independent variable is x.

This global table can be a bit confusing if one compares how SPSS designates each of the coefficients in comparison to how they are notated in the equations above. Notice in particular the coefficients in the table for the cubic model; where the table lists b1 and b3 which correspond to the third and first coefficients from left to right in the equation. This is why it is recommended to always check the box to display the ANOVA table; which also displays a more intuitive coefficients table for each model being compared—as the example below shows for the cubic model.

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.984	.969	.965	.092

The independent variable is x.

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	6.824	3	2.275	269.732	.000
Residual	.219	26	.008		
Total	7.043	29			

The independent variable is x.

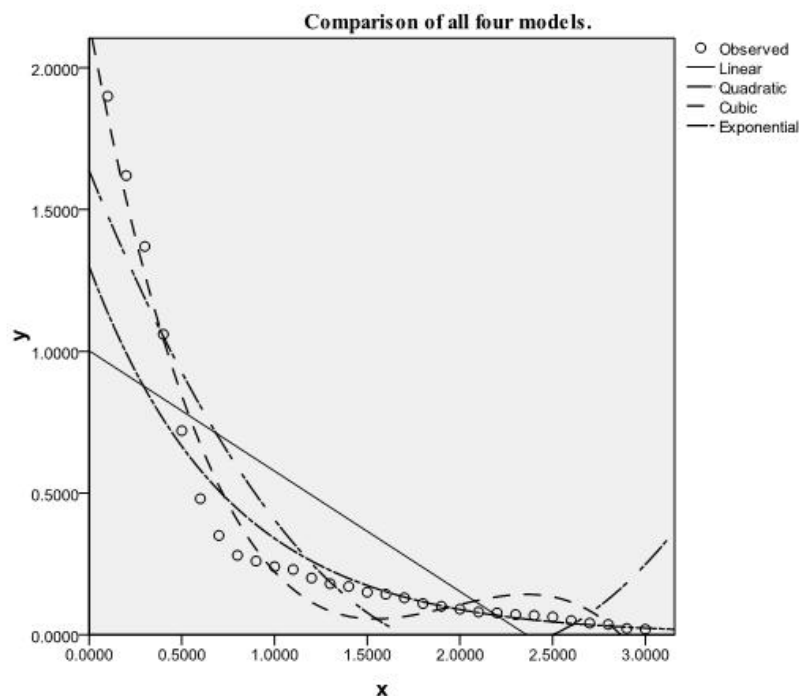
Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

x	-3.486	.210	-6.228	-16.606	.000
x ** 2	1.868	.156	10.661	11.973	.000
x ** 3	-.319	.033	-5.298	-9.634	.000
(Constant)	2.160	.076		28.271	.000

Notice with this style of coefficients table the coefficients are designated not with b_1 , b_2 , b_3 ; but rather with the exponents, such as x , x^{**2} , x^{**3} , which clarifies where each coefficient should go in the cubic regression equation. Also, the model summary table for each model provides not just R^2 , but also Adj. R^2 .

Please note we have been using Adj. R^2 throughout this article as a metric for comparing our models because it is readily available, easy to interpret, and is extremely well known. Most are familiar with the shrinkage which makes Adj. R^2 preferable over R^2 . However, when comparing models, Adj. R^2 is not much better than the base R^2 . One rule of thumb is, if there is a .10 or 10% difference between Adj. R^2 and R^2 then overfitting is a concern (Harrell, Lee, & Mark, 1996). Therefore; it is recommended the Akaike's information criterion (AIC; Akaike, 1974) or the Bayesian information criterion (BIC; Schwarz, 1978) be used instead—both of which are much more appropriate for assessing a model's worth and comparing multiple model's fit (Kass & Raftery, 1995).

Although a bit confusing, the following scatter plot was produced using the 'Curve Estimation...' function and reflects each of the four models reviewed here.



Please also note that this article does not intend to represent the complete range of techniques available for extracting the maximum information from a set of data or a regression analysis approach to data. There are other types of regression analysis and techniques available that may allow the researcher to extract a more complete picture of the phenomena of interest from the data. Regression analysis examples include but are not limited to; Tobit, Quantile, Partial Least Square, Binary Logistic, Multinomial Logistic, Ordinal, Probit, 2-Stage Least Square, as well as re-sampling techniques for reducing bias such as bootstrapping. If there is one message this author hopes the reader will take from this article, it is this; do not fall into the trap of complacency and rely exclusively on the default settings or analysis of your software, be thorough and un-intimidated by the plethora of non-traditional data analytic techniques at your disposal.

Until next time, remember; this land is your land, this land is my land... and I'll be at Alice's Restaurant.

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716 – 723. (1) (2) (3)

Harrell, F. E., Lee, K. L., & Mark, D. B. (1996). Multivariate prognostic models: Issues in developing models, evaluating assumptions and adequacy, and measuring and reducing errors. *Statistics in Medicine*, 15, 361 – 387. (1) (2) (3)

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*This is a slightly edited version of an article that appeared in the [April, 2010 issue](#) of *Benchmarks Online*.



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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. **SPSS and SAS courses are now offered [online only](#)**. RSS staff will be still be available for consultation on those topics, however. Another class available online is [Introduction to R](#). Make sure and check out the **RSS Matters** article [Statistical Resources](#) in the July 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 [Human Resources Department](#) (they have a new comprehensive training curriculum), 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.

EIS training is available and expanding. Click [here](#) for online tutorials.

Microsoft IT Academy

All **students, faculty and staff** within the UNT System now have access to online learning via the Microsoft IT Academy. See [this article](#) in the July 2012 issue of *Benchmarks Online* for more information.

Microsoft E-Learning

Microsoft E-Learning courses are available for **faculty and staff** via our UNT-Microsoft Campus Agreement. Please contact Claudia Lynch at lynch@unt.edu for instructions on accessing this training. If you haven't accessed the training since last year you will need to get a new access code. UNT, UNTHSC and UNTSYSTEM e-mail addresses are now able to access Microsoft E-Learning.

Microsoft Outlook Tutorials and much more

The Enterprise Messaging and Directory Services Group has all sorts of useful information on their [website](#), including tutorials and FAQs.

Central Web Support

Central Web Support [provides](#) "End-User and Administrative Support for hosted general web sites, and Drupal websites for academic and administrative departments." Visit their [website](#) for "How-Tos about Everything."

CLEAR

CLEAR offers courses especially for Faculty Members. A list of topics and further information can be found [here](#).

Blackboard Learn 9.1 Spring 2013 Bootcamp - 16 Sessions, January 27 - May 23. Chilton 245

The Blackboard Learn Boot Camp is a workshop introducing instructors to designing your courses for online delivery. ***This hands-on workshop is targeted for instructors new to Blackboard Learn and/or those interested in learning more about quality course design.*** Topics will cover best practices for course design as well as the basics of Blackboard Learn.

Course Code: UO13BC http://clear.unt.edu/sites/default/files/2013_Spring_Bootcamps.pdf

University Forum on Teaching & Learning

Coming in April - [2013 University Forum on Teaching & Learning](#)

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.



For additional information surf over to <http://www.ed2go.com/unt/>

Ed2go has a blog! Click on the logo on the right to find out more information on company news, videos, career advice and tips from ed2go instructors.

Information Security Awareness

The UNT Information Security team offers Information Security Awareness [courses](#) to all UNT faculty and staff. Topics to be covered will include workstation security, sensitive data handling, copyright infringement issues, identity theft, email security, and more.

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

Please contact [Gabe Marshall](#) in ITSS Information Security if you have any questions, or would like more information about the online training. **Either attending a live class or going through the online training will count towards your training requirement.** You can also request a customized course to be taught for your department.

Alternate Forms of Training

Many of the General Access Labs around campus have tutorials installed on their computers.

See <http://www.gacl.unt.edu/> for a list of labs and their locations. The 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>

The [Training Website](#) has all sorts of information about alternate forms of training. Computer Based Training (CBT) and Web-based training are some of the alternatives offered, although due to the rising costs of training, shrinking budgets and changing technology, computer-based training at UNT is in a state of transition. For up-to-date information on CBT at UNT, see the CBT [website](#).

Info~Tech, UNT's new IT Research Partner

Info~Tech has replaced Gartner Core Research Services as UNT's IT research partner. For more information see the August *Campus Computing News* [article](#).

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.



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Staff Activities

Staff activities for [UIT](#) are reported in this column. ITSS staff activities are handled by [ITSS Communications](#).

Transitions

New Employees:

- **Yumia Hobbs**, UIT Helpdesk Consultant (part-time).
- **Zach Marks**, UIT Helpdesk Consultant (part-time).
- **Danny Lopez**, Information Systems Student Assistant, Facilities (AITS).
- **Nathan Warner**, CSS Tech, Classroom Support Services (part-time).

No longer working in UIT:

- **Christopher Edwards**, UIT Helpdesk Consultant (part-time).
- **Abhishek Sharma**, CSS Tech, Classroom Support Services (part-time).
- **Phillip Vriseno**, CSS Tech, Classroom Support Services (part-time).



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ITSS Quarterly Newsletter

By [Claudia Lynch](#), *Benchmarks* *Online* Editor

Issue 2 (January 2013) of the *ITSS Quarterly Newsletter* is now available. It is comprised of IT-related news relevant to anyone who uses or has an interest in shared services and applications throughout the UNT System and its member institutions. In this issue:

- Update from Michael Di Paolo, UNT System Associate Vice Chancellor & CIO
- Hooper returns full time to UNT
- New ITSS Strategic Services Team in place
- IT Shared Services announces new service for worldwide network access
- ITSS take ITIL approach
- Information Security Team leads disaster recovery tabletop exercise
- Improvements made to change management process
- Phishing email attacks target UNT System communities
- EIS Registration Functionality adapted for Accelerated Online Programs
- User Requisition of Virtual Servers Saves University over \$2M and Cuts Deployment from Weeks to Minutes
- EIS Bulk Email Delivery Fine Tuned
- New EIS change management/version control application implemented
- Improvements made to Blackboard Learn
- IT Service Management Tool Selection

Find issue 2 of the *ITSS Quarterly Newsletter* here: <http://itss.untsystem.edu/itss-quarterly-newsletter/Jan2013/index.htm>



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Today's Cartoon



"Your X-ray showed a broken rib, but we fixed it with Photoshop."

From "Today's Cartoon by Randy Glasbergen", posted with special permission. For many more cartoons, please visit www.glasbergen.com.



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