Benchmarks Online

Volume 4 - Number 10 * October 2001

Feature Articles

Campus Computing News

Dr. Maurice Leatherbury gives an "Enterprise Information System Selection Status Report." This system will eventually replace virtually all of the aging administrative systems on campus over the next three or four years. Check it out!

Update on SmartForce CBT

The response to the SmartForce Computer Based Training Campus system has been extensive and positive. Read this article and find out what the future holds for computer based training here at UNT.

Lab-of-the-Month

Click on the title above and find out what lucky General Access Lab was profiled this month.

FrontPage and Dreamweaver

Confused about which of these products you should use? Thinking of switching? This article can help you make those decisions.

WebDAV and You

Did you know that there is "A New Method for Publishing and Editing Personal Web Pages?" Well there is and WebDAV is a part of it. Check it out.

Your First ColdFusion Application

About Benchmarks *Online*

Subscribe to Benchmarks *Online*

Shannon Peevey continues his step-by-step guidelines for getting started with ColdFusion here at UNT.

Today's Cartoon

Click on the title above for an information age laugh.

Don't forget to check out our monthly columns. This month's topics:

- **RSS Matters** -- "Using the Bootstrap with Small Data Sets: The Smoothed Bootstrap" Last month we examined using the bootstrap and robust estimation to calculate statistical power, this month we explore the use of the smoothed bootstrap with small data sets. The GNU S language, "R" is used to implement this procedure.
- **SAS Corner** -- "What's new in SAS 8.2? - Publishing in Portable Document Format" Very Exciting!
- **The Network Connection** -- "Your rights online: eroding away?" Electronic survelience may be coming to a desktop near you. Maybe even yours.
- **Link of the Month** -- "Texas Department of Health" The way things are going these days, it probably wouldn't hurt to bookmark this site. Note the name change of this feature.
- **WWW@UNT.EDU** -- "A New Method for Publishing and Editing Personal Web Pages" This is an important article for anyone who has a personal Web page here at UNT. Should be read in conjunction with "WebDAV and You."
- **Short Courses** -- Find out about the fall Academic Computing Services (ACS) short courses, and more, here.
- **IRC News** -- Minutes of the Information Resources Council are printed here when

they are available. All the new IRC Members are listed this time as well as the September minutes.

- **Staff Activities** -- New employees and employee awards and recognitions are included in this article.

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Research and Statistical Support
University of North Texas

RSS Matters

Using the Bootstrap with Small Data Sets: The Smoothed Bootstrap

By Dr. Rich Herrington, Research and Statistical Support Consultant

Last month we examined using the bootstrap and robust estimation to calculate statistical power, this month we explore the use of the smoothed bootstrap with small data sets. The GNU S language, "R" is used to implement this procedure. R is a statistical programming environment that is a clone of the S and S-Plus language developed at Lucent Technologies. In the following document we illustrate the use of a GNU Web interface to the R engine on the "rss" server, http://rss.acs.unt.edu/cgi-bin/R/Rprog. This GNU Web interface is a derivative of the "Rcgi" Perl scripts available for download from the CRAN website, http://www.cran.r-project.org (the main "R" website). Scripts can be submitted interactively, edited, and be re-submitted with changed parameters by selecting the hypertext link buttons that appear below the figures. For example, clicking the "Run Program" button below samples 1000 random numbers from a normal distribution, then uses nonparametric density estimation to fit a density curve to the data. To view any text output, scroll to the bottom of the browser window. To view the density curve, select the "Display Graphic" link. The script can be edited and resubmitted by changing the script in the form window and then selecting "Run the R Program". Selecting the browser "back page" button will return the reader to this document.

```
x<-rnorm(1000)
rnorm(1000)
summary(x)
plot(density(x))
```

Run Program

The Disadvantages of Using Small Sample Sizes with the Bootstrap

In the nonparametric bootstrap, samples are drawn from a discrete set. This can be a serious disadvantage in small sample sizes in that spurious fine structure, in the original data, may be faithfully reproduced in the simulated data that has not occurred in the population. Difficulties can arise if the goal of the simulation is to produce samples that have the underlying “true” structure of the observed data without having spurious details arise from random effects. Another concern is that with small samples, with only a few values to select from, the bootstrap samples will underestimate the true variability. Statisticians generally regard the use of the bootstrap with sample sizes less than 10 as too small to rely on (Chernick, 1999).

The Smoothed Bootstrap

One approach to dealing with the discreteness of the empirical distribution function with small sample sizes, is to smooth the empirical distribuion function and then resample from the smoothed empirical distribution function. It has been shown that the nonparametric bootstrap is improved in non-smooth cases, such as the median (Fernholz, 1993). Even though the "smoothed bootstrap" was considered early on by bootstrap researchers, there was little evidence to indicate under which conditions smoothing would be beneficial (Hall P., DiCiccio, T. & Romano, J, 1989; Silverman, B.W., & Young, G.A., 1987). Recent research on the smoothed bootstrap demonstrates that for samll sample sizes, with proper kernel bandwith selection, smoothing the empirical distribution function can yeild a first-order reduction in coverage error for the one-sided percentile method. The one-sided percentile method, based on the smoothed bootstrap with an optimally chosen bandwith, becomes asymptotically as accurate as either the bootstrap t or the accelerated bias correction (Bca) methods (Polansky, A.M. & Schucany, W.R., 1997). Similar arguments show that second-order corrections can be realized for first-order correct confidence intervals such as the two-sided percentile method intervals and bootstrap t intervals (Polansky, 2001). The smoothed bootstrap can also decrease coverage error for finite samples as well (Polansky, 2000). That is, type I error for small sample sizes can be reduced by smoothing the empirical distribution function, when using the Percentile Bootstrap method for calculating confidence intervals. It is important for the present study, to note that Fernholz (1993, 1997) proved that by smoothing the empirical distribution function with an appropriate kernel, the variance and the mean square error of certain statistical functionals can be reduced. A functional is a mapping that assigns a real value to a function. Examples of functionals are the parameters of distribution functions, including the mean, the variance, the skewness and the kurtosis of the distribution. Other examples include sample quantiles, some L-estimators, and M-estimators (Fernholz, 1997). Specifically, Fernholz demonstrates that a smaller variance is achieved when the influence function is either discontinuous (such as in the median) or piecewise linear with convexity towards the x-axis (such as in the Huber and biweight type M-estimators). Essentially, the smoothed bootstrap can be used to improve overall performance (decrease bias, MSE of estimators) in small sample sizes. Brown, Hall, and Young (2001) show that for the median, that smoothing increases efficiency for normal data over that of the conventional median. The algorithm of the smoothed bootstrap is outlined in Silverman, B.W. (1986, page 141). The basic idea is to set:

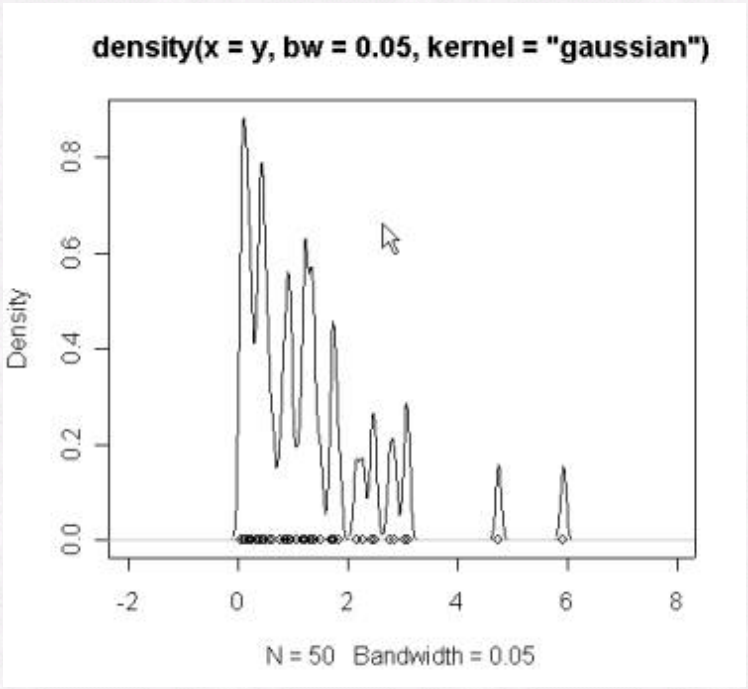
$$Y = X^{*} + he$$

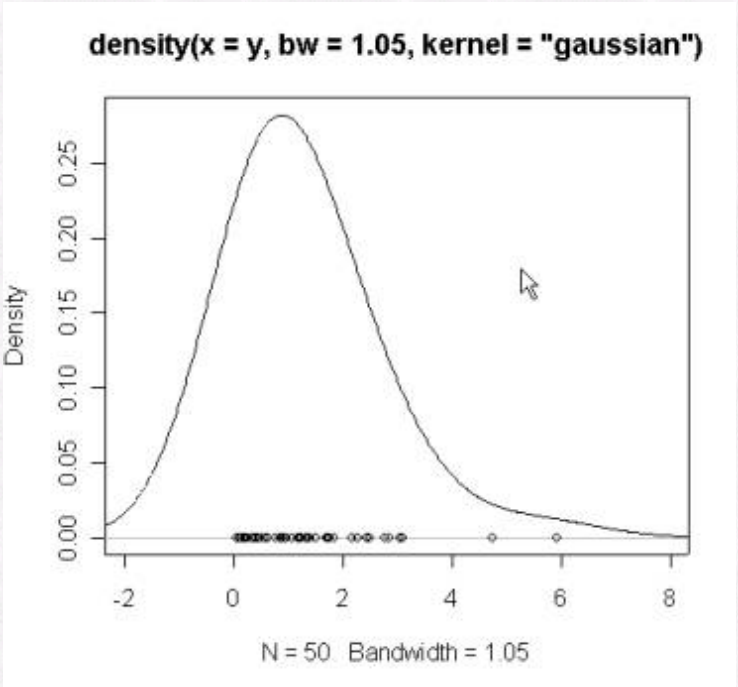
where each X^{*} consist of the bootstrap observations from a bootstrap sample; e is a random deviate from a probability density function K; and h is a smoothing parameter that can be calculated from the sample moments (e.g. standard deviation). The probability density K is often referred to as the "kernel". A natural candidate for the kernel is the Gaussian distribution (normal distribution). If a Gaussian kernel is selected, then an optimal smoothing parameter can be estimated from the data (a so-called "plug-in" estimate of h):

$$h_{opt} = 1.06 \cdot \sigma \cdot n^{-1/5}$$

where σ is estimated from the sample data. h will work well if the population is normally distributed, but it may oversmooth if the population is either multi-modal or skewed (the sample estimate of σ is not a resistant measure). Silverman (1986, page 46) reports that for heavily skewed data, h will oversmooth, but that the formula is remarkably insensitive to kurtosis within the t family of distributions. To give some sense of how the smoothing operation effects a skew distribution, The figures below, show an exponential distribution of sample size 50. The

top panel displays little or no smoothing, and the bottom panel displays much greater smoothing. It is evident that most of the skewness in the original data set is gone, and tends toward a symmetric distribution resembling a normal distribution. However, if the point is to only smooth local irregularities, but retain the overall shape of the distribution, oversmoothing will mis-represent the underlying population distribution.





The Smoothed Bootstrap Implemented in the "S" Language

The following S code set implements the smoothed bootstrap using two different kernels (*K*), and with various different window estimators (*h*). Twenty numbers are sampled from the normal distribution; this becomes our population that we will resample from. The following code chooses a Gaussian kernel with a standard smoothing parameter for the smoothed bootstrap. The population mean is estimated using the sample mean. One might change the following code

to explore the effects of: 1) using different sample sizes, 2) using different numbers of bootstrap samples; 3) using either the variance corrected or uncorrected versions of the kernels, 3) using robust estimators with the smoothed bootstrap, rather than the mean, and 4) using different window estimators combined with different kernels.

```
#### Set  random number seed
set.seed(98)

#### Simulate 20 numbers from normal distribution
#       with mean zero and variance one
xdata<-rnorm(20)

###Set sample size to draw from smoothed
#     bootstrap
samp.size<-500

### Set number of bootstrap samples to draw
num.boot.samp<-500

### Windowing functions for kernel density estimate
h.window<-function(x, samp.size, window=1){
  if (window==0) {wind.weight<-0}
  if (window==1) {stdev<-var(x)^.5
    wind.weight<-(1.06)*stdev*samp.size^(-1/5)}
  if (window==2) {quar <- diff(quantile(x, c(.25, .75)))
    wind.weight<-(.79)*quar*samp.size^(-1/5)}
  if (window==3) {stdev<-var(x)^.5
    skew<-sum((x-mean(x))^3)/samp.size
    wind.weight<-(((abs(skew)*(1.64^2+2))/(3*stdev*1.64))^.5)^(-1/4)}
  if (window==4) {wind.weight<-samp.size^(-1/2)}
  if (window==5) {stdev<-var(x)^.5
    wind.weight<-(samp.size)^(-3/4)*(stdev)*(2^(1/2))}
  if (window==6){stdev <- var(x)^0.5
    wind.weight <- (1.41)*stdev*samp.size^(-3/4)}
  if (window==7){stdev <- var(x)^0.5
    quar <- diff(quantile(x, c(.25, .75)))
    wind.weight <- min(stdev,(.90)*(quar/1.34)*samp.size^(-1/5))}
return(wind.weight)
}

### Simple Bootstrap, no smoothing
rdensity<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T), nrow=num.boot.samp)
  y<-x.unif
return(y)}

### Corrected estimates for variance of estimated distribution.
#     Correcting for size of windowing function

### Variance corrected estimates of
#     the nonparametric density smoothing
#     parameter - h

#### Epanechnikov kernel - variance corrected
rdensity2<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T), nrow=num.boot.samp)
  x.unif.mean<-apply(x.unif, 1, mean)
  x.unif.mean<-matrix(x.unif.mean, ncol=samp.size,
    nrow=num.boot.samp, byrow=F)
  x.unif.var<-apply(x.unif, 1, var)
  x.h.1<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h.1, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  x.kern<-matrix(runif(x.length*3, -1, 1), ncol=3)
  epsilon<-ifelse((abs(x.kern[,3]) >= abs(x.kern[,2])) &
    (abs(x.kern[,3])>= abs(x.kern[,1])), x.kern[,2], x.kern[,3])
  epsilon<-matrix(epsilon, nrow=num.boot.samp)
  kern.var<-.20
  correct.var<-matrix(1+x.h.1^2*(kern.var/x.unif.var)^.5,
    ncol=samp.size, nrow=num.boot.samp, byrow=F)
  y<-x.unif.mean+(x.unif-x.unif.mean+x.h*epsilon)/correct.var
return(y)}

### Gaussian Kernel - variance corrected
rdensity3<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T), nrow=num.boot.samp)
  x.unif.mean<-apply(x.unif, 1, mean)
  x.unif.mean<-matrix(x.unif.mean, ncol=samp.size,
    nrow=num.boot.samp, byrow=F)
  x.unif.var<-apply(x.unif, 1, var)
  x.h.1<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h.1, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  x.kern<-matrix(runif(x.length*3, -1, 1), ncol=3)
  epsilon<-matrix(rnorm(x.length), nrow=num.boot.samp)
  kern.var<-1
  correct.var<-matrix(1+x.h.1^2*(kern.var/x.unif.var)^.5,
    ncol=samp.size, nrow=num.boot.samp, byrow=F)
  y<-x.unif.mean+(x.unif-x.unif.mean+x.h*epsilon)/correct.var
return(y)}

### No variance correction kernels

### No variance correction, Epanechnikov kernel
rdensity4<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T),
    nrow=num.boot.samp)
  x.h<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  x.kern<-matrix(runif(x.length*3, -1, 1), ncol=3)
  epsilon<-ifelse((abs(x.kern[,3]) >= abs(x.kern[,2]))
    & (abs(x.kern[,3]) >= abs(x.kern[,1])),x.kern[,2],
    x.kern[,3])
  epsilon<-matrix(epsilon, nrow=num.boot.samp)
  y<-x.unif+x.h*epsilon
return(y)}

### No variance correction, Gaussian kernel
rdensity5<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T),
    nrow=num.boot.samp)
  x.h<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  epsilon<-matrix(rnorm(x.length), nrow=num.boot.samp)
  y<-x.unif+x.h*epsilon
return(y)}

### Sample from smoothed bootstrap using
#       variance corrected Gaussian kernel with
#     standard window
x.new.boot<-rdensity3(orig.data=xdata, samp.size,
  num.boot.samp, window=1)

x.new.result<-apply(x.new.boot, 1, mean)
x.new2.result<-apply(x.new.boot, 1, var)

### Mean and variance of the 500 bootstrap means
x.mean.500<-mean(x.new.result)
x.var.500<-mean(x.new2.result)

### Pick a particular bootstrap sample to plot
#     against the original sample
x.new<-x.new.boot[200,]

### Plot graphics on 2 by 2 grid
par(mfrow=c(2,2))

### Attach library of robust regression and
#     covariance methods
library(lqs)

xdata.qq<-qqplot(xdata, x.new, plot=F)
plot(xdata.qq)
abline(lmsreg(xdata.qq$x, xdata.qq$y))
```

```
#### Set  random number seed
set.seed(98)

#### Simulate 20 numbers from normal distribution
#        with mean zero and variance one
xdata<-rnorm(20)

###Set sample size to draw from smoothed
#     bootstrap
samp.size<-500

### Set number of bootstrap samples to draw
num.boot.samp<-500

### Windowing functions for kernel density estimate
h.window<-function(x, samp.size, window=1){
  if (window==0) {wind.weight<-0}
  if (window==1) {stdev<-var(x)^.5
    wind.weight<-(1.06)*stdev*samp.size^(-1/5)}
  if (window==2) {quar <- diff(quantile(x, c(.25, .75)))
    wind.weight<-(.79)*quar*samp.size^(-1/5)}
  if (window==3) {stdev<-var(x)^.5
    skew<-sum((x-mean(x))^3)/samp.size
    wind.weight<-((abs(skew)*(1.64^2+2))/(3*stdev*1.64))^.5)^(-1/4)}
  if (window==4) {wind.weight<-samp.size^(-1/2)}
  if (window==5) {stdev<-var(x)^.5
    wind.weight<-(samp.size)^(-3/4)*(stdev)*(2^(1/2))}
  if (window==6){stdev <- var(x)^0.5
    wind.weight <- (1.41)*stdev*samp.size^(-3/4))
  if (window==7){stdev <- var(x)^0.5
    quar <- diff(quantile(x, c(.25, .75)))
    wind.weight <- min(stdev,(.90)*(quar/1.34)*samp.size^(-1/5))}
return(wind.weight)
}

### Simple Bootstrap, no smoothing
rdensity<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T), nrow=num.boot.samp)
  y<-x.unif
return(y)}

### Corrected estimates for variance of estimated distribution.
#     Correcting for size of windowing function

### Variance corrected estimates of
#     the nonparametric density smoothing
#     parameter - h

#### Epanechnikov kernel - variance corrected
rdensity2<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T), nrow=num.boot.samp)
  x.unif.mean<-apply(x.unif, 1, mean)
  x.unif.mean<-matrix(x.unif.mean, ncol=samp.size,
    nrow=num.boot.samp, byrow=F)
  x.unif.var<-apply(x.unif, 1, var)
  x.h.1<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h.1, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  x.kern<-matrix(runif(x.length*3, -1, 1), ncol=3)
  epsilon<-ifelse((abs(x.kern[,3]) >= abs(x.kern[,2])) &
    (abs(x.kern[,3])>= abs(x.kern[,1])), x.kern[,2], x.kern[,3])
  epsilon<-matrix(epsilon, nrow=num.boot.samp)
  kern.var<-.20
  correct.var<-matrix(1+x.h.1^2*(kern.var/x.unif.var)^.5,
    ncol=samp.size, nrow=num.boot.samp, byrow=F)
  y<-x.unif.mean+(x.unif-x.unif.mean+x.h*epsilon)/correct.var
return(y)}

### Gaussian Kernel - variance corrected
rdensity3<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T), nrow=num.boot.samp)
  x.unif.mean<-apply(x.unif, 1, mean)
  x.unif.mean<-matrix(x.unif.mean, ncol=samp.size,
    nrow=num.boot.samp, byrow=F)
  x.unif.var<-apply(x.unif, 1, var)
  x.h.1<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h.1, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  x.kern<-matrix(runif(x.length*3, -1, 1), ncol=3)
  epsilon<-matrix(norm(x.length), nrow=num.boot.samp)
  kern.var<-1
  correct.var<-matrix(1+x.h.1^2*(kern.var/x.unif.var)^.5,
    ncol=samp.size, nrow=num.boot.samp, byrow=F)
  y<-x.unif.mean+(x.unif-x.unif.mean+x.h*epsilon)/correct.var
return(y)}

### No variance correction kernels

### No variance correction, Epanechnikov kernel
rdensity4<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T),
    nrow=num.boot.samp)
  x.h<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  x.kern<-matrix(runif(x.length*3, -1, 1), ncol=3)
  epsilon<-ifelse((abs(x.kern[,3]) >= abs(x.kern[,2]))
    & (abs(x.kern[,3]) >= abs(x.kern[,1])),x.kern[,2],
    x.kern[,3])
  epsilon<-matrix(epsilon, nrow=num.boot.samp)
  y<-x.unif+x.h*epsilon
return(y)}

### No variance correction, Gaussian kernel
rdensity5<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T),
    nrow=num.boot.samp)
  x.h<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  epsilon<-matrix(rnorm(x.length), nrow=num.boot.samp)
  y<-x.unif+x.h*epsilon
return(y)}

### Sample from smoothed bootstrap using
#     variance corrected Gaussian kernel with
#     standard window
x.new.boot<-rdensity3(orig.data=xdata, samp.size,
  num.boot.samp, window=1)

x.new.result<-apply(x.new.boot, 1, mean)
x.new2.result<-apply(x.new.boot, 1, var)

### Mean and variance of the 500 bootstrap means
x.mean.500<-mean(x.new.result)
x.var.500<-mean(x.new2.result)

### Pick a particular bootstrap sample to plot
#     against the original sample
x.new<-x.new.boot[200,]

### Plot graphics on 2 by 2 grid
par(mfrow=c(2,2))

### Attach library of robust regression and
#     covariance methods
library(lqs)

xdata.qq<-qqplot(xdata, x.new, plot=F)
plot(xdata.qq)
abline(lmsreg(xdata.qq$x, xdata.qq$y))
hist(xdata)
hist(x.new)

### The average Mean and Variance of all 500 bootstrap samples
x.mean.500
x.var.500

### Summarize original data
length(xdata)
summary(xdata)
var(xdata)

### Summarize resampled data from smoothed
#   bootstrap
length(x.new)
```

```
#### Set  random number seed
set.seed(98)

#### Simulate 20 numbers from normal distribution
#        with mean zero and variance one
xdata<-rnorm(20)

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return(y)}

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#     Correcting for size of windowing function

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#### Epanechnikov kernel - variance corrected
rdensity2<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T), nrow=num.boot.samp)
  x.unif.mean<-apply(x.unif, 1, mean)
  x.unif.mean<-matrix(x.unif.mean, ncol=samp.size,
    nrow=num.boot.samp, byrow=F)
  x.unif.var<-apply(x.unif, 1, var)
  x.h.1<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h.1, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  x.kern<-matrix(runif(x.length*3, -1, 1), ncol=3)
  epsilon<-ifelse((abs(x.kern[,3]) >= abs(x.kern[,2])) &
    (abs(x.kern[,3])>= abs(x.kern[,1])), x.kern[,2], x.kern[,3])
  epsilon<-matrix(epsilon, nrow=num.boot.samp)
  kern.var<-.20
  correct.var<-matrix(1+x.h.1^2*(kern.var/x.unif.var)^.5,
    ncol=samp.size, nrow=num.boot.samp, byrow=F)
  y<-x.unif.mean+(x.unif-x.unif.mean+x.h*epsilon)/correct.var
return(y)}

### Gaussian Kernel - variance corrected
rdensity3<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T), nrow=num.boot.samp)
  x.unif.mean<-apply(x.unif, 1, mean)
  x.unif.mean<-matrix(x.unif.mean, ncol=samp.size,
    nrow=num.boot.samp, byrow=F)
  x.unif.var<-apply(x.unif, 1, var)
  x.h.1<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h.1, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  x.kern<-matrix(runif(x.length*3, -1, 1), ncol=3)
  epsilon<-matrix(norm(x.length), nrow=num.boot.samp)
  kern.var<-1
  correct.var<-matrix(1+x.h.1^2*(kern.var/x.unif.var)^.5,
    ncol=samp.size, nrow=num.boot.samp, byrow=F)
  y<-x.unif.mean+(x.unif-x.unif.mean+x.h*epsilon)/correct.var
return(y)}

### No variance correction kernels

### No variance correction, Epanechnikov kernel
rdensity4<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T),
    nrow=num.boot.samp)
  x.h<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  x.kern<-matrix(runif(x.length*3, -1, 1), ncol=3)
  epsilon<-ifelse((abs(x.kern[,3]) >= abs(x.kern[,2]))
    & (abs(x.kern[,3]) >= abs(x.kern[,1])),x.kern[,2],
    x.kern[,3])
  epsilon<-matrix(epsilon, nrow=num.boot.samp)
  y<-x.unif+x.h*epsilon
return(y)}

### No variance correction, Gaussian kernel
rdensity5<-function(orig.data, samp.size, num.boot.samp, window){
  x<-orig.data # orig.data
  x.length<-samp.size*num.boot.samp
  x.unif<-matrix(sample(x, size=x.length, replace=T),
    nrow=num.boot.samp)
  x.h<-apply(x.unif, 1, h.window, samp.size, window)
  x.h<-matrix(x.h, ncol=samp.size, nrow=num.boot.samp, byrow=F)
  epsilon<-matrix(rnorm(x.length), nrow=num.boot.samp)
  y<-x.unif+x.h*epsilon
return(y)}

### Sample from smoothed bootstrap using
#     variance corrected Gaussian kernel with
#     standard window
x.new.boot<-rdensity3(orig.data=xdata, samp.size,
  num.boot.samp, window=1)

x.new.result<-apply(x.new.boot, 1, mean)
x.new2.result<-apply(x.new.boot, 1, var)

### Mean and variance of the 500 bootstrap means
x.mean.500<-mean(x.new.result)
x.var.500<-mean(x.new2.result)

### Pick a particular bootstrap sample to plot
#     against the original sample
x.new<-x.new.boot[200,]

### Plot graphics on 2 by 2 grid
par(mfrow=c(2,2))

### Attach library of robust regression and
#     covariance methods
library(lqs)

xdata.qq<-qqplot(xdata, x.new, plot=F)
plot(xdata.qq)
abline(lmsreg(xdata.qq$x, xdata.qq$y))
hist(xdata)
hist(x.new)

### The average Mean and Variance of all 500 bootstrap samples
x.mean.500
x.var.500

### Summarize original data
length(xdata)
summary(xdata)
var(xdata)

### Summarize resampled data from smoothed
#   bootstrap
length(x.new)
```

```
#### Set  random number seed
set.seed(98)

#### Simulate 20 numbers from normal distribution
#       with mean zero and variance one
xdata<-rnorm(20)

###Set sample size to draw from smoothed
#     bootstrap
samp.size<-500

### Set number of bootstrap samples to draw
num.boot.samp<-500

### Windowing functions for kernel density estimate
h.window<-function(x, samp.size, window=1){
  if (window==0) {wind.weight<-0}
  if (window==1) {stdev<-var(x)^.5
```

Run Program

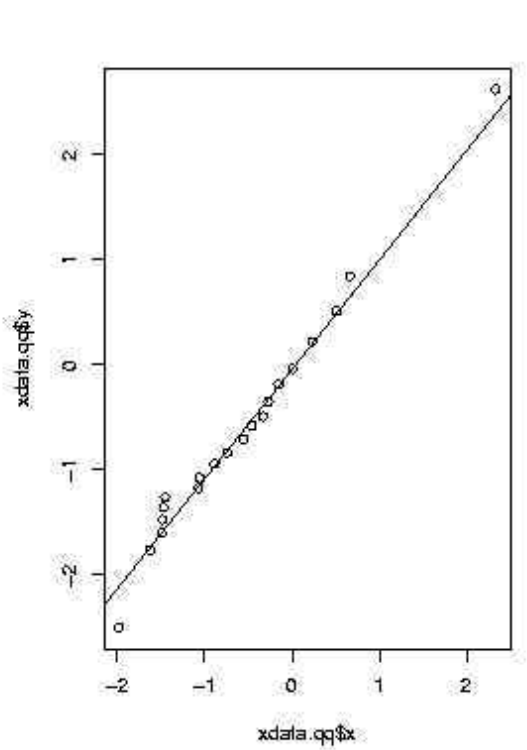
Results

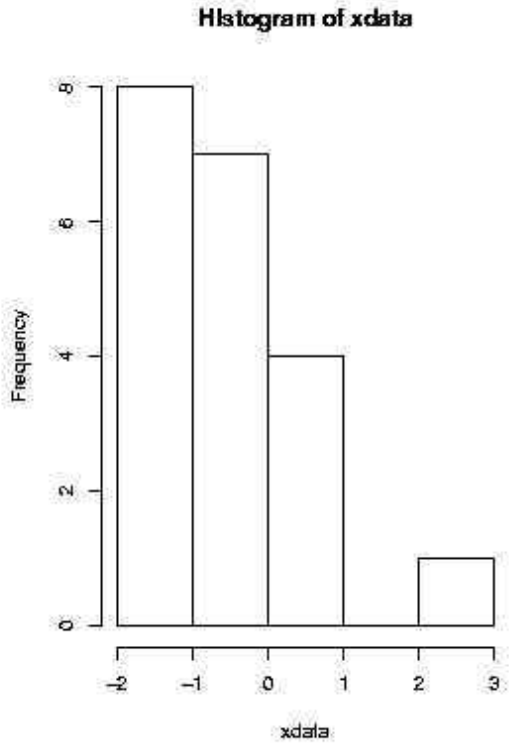
Running the S code listed above produces the following text and graphics:

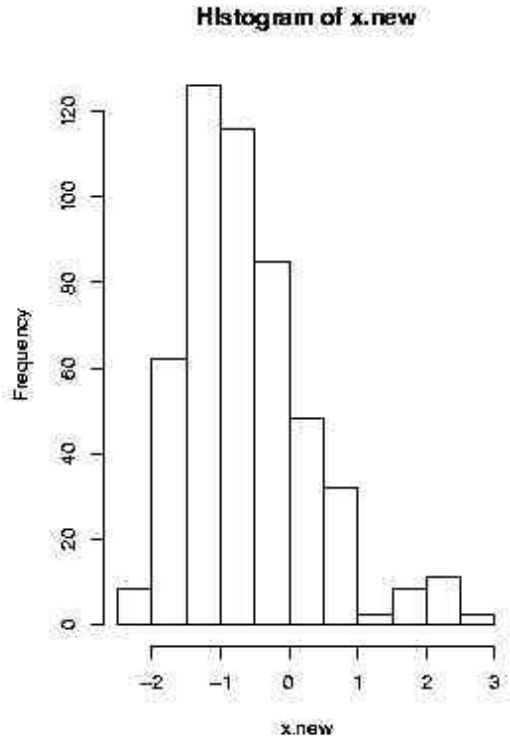
```
> # The average Mean and Variance of all 500 bootstrap samples
>
> x.mean.500
[1] -0.5682712
> x.var.500
[1] 0.8848028
>
> # Summarize original data
>
> length(xdata)
[1] 20
> summary(xdata)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
-1.9820 -1.4540 -0.6479 -0.5646 -0.1187  2.3320
> var(xdata)
[1] 1.020477
>
> # Summarize resampled data from smoothed
> # bootstrap
>
> length(x.new)
[1] 500
> summary(x.new)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
-2.4970 -1.2920 -0.7711 -0.6230 -0.1672  2.6220
> var(x.new)
[1] 0.852574
```

The preceeding code uses the variance adjusted Gaussian kernel to smooth the empirical distribution function (rdensity3). We see that the average mean of the 500 bootstrap samples is virtually identical to the original sample: .568. The average variance of the 500 bootstrap samples, underestimates the original sample variance by a substantial amount: .885 versus the original population variance of 1.00. The 200th bootstrap sample is extracted to plot against the original sample to see how well the shape of the 200th bootstrap sample, with an N=500, captures the shape of the original sample. As can be seen below, the larger sample size smooths the discreetness of the original sample while retaining the overall shape. These results also suggest that the variance corrected version of the Gaussian kernel "overadjusts" for the variance introduced by the smoothing parameter. Further simulation results using the unadjusted version of the Gaussian kernel (rdensity5) show that the unadjusted version does very well in recapturing the population variance. Try re-running the S code above, replacing the sample size with N=10 (use rnorm(10) instead of rnorm(20) in the beginning of the program), and the kernel density estimator with "rdensity5" instead of using "rdensity3" (x.new.boot<-

rdensity3(orig.data=xdata, samp.size,
num.boot.samp, window=1). Compare the mean and variance of the original data (xdata) with the mean and variance of all 500 bootstrap samples. How close are they compared to the results displayed above?







Conclusions

The bootstrap methodology allows the performance of classical and robust estimators to be evaluated in real world data sets. However, much still remains unknown about the finite sample properties of the bootstrap. In particular, small sample sizes can cause the bootstrap to fail, and give poor error coverage for type I errors, for a number of the more popular methods for calculating confidence intervals (Bca, studentized t bootstrap, and the percentile bootstrap). In contrast, the smoothed bootstrap holds promise for a number of robust estimators (median, L-estimators, M-estimators, quantile estimators), in small sample settings (i.e. approximately N< 15). However, it is evident that the proper selection of the smoothing parameter (*h*) is important so that oversmoothing or undersmoothing does not occur. Like robust estimators, smoothing the empirical distribution function can reduce the impact of heavy tails on a location estimatorl. Optimal selection of the smoothing parameter, *h* , is important so that undersmoothing or oversmoothing does not occur. Various approaches have been tried, for example, adaptive estimators (Silverman, 1986, page 48). Robust estimators such as M-estimators, optimally downweight the tails according to a statistical critierion (maximum likelihood) for a given set of tuning constants. Tuning constants are recommended that work well with a wide range of distributions found in real data (Hoaglin, Moesteller, & Tukey, 1983). The combined use of the smoothed bootstrap with an M-estimator as a location estimate, calls for an optimal combination of the tuning constants (e.g. *k*) for robust location, and the smoothing parameter (e.g. *h*) for the smoothed bootstrap. One computational approach towards this goal, would be to use various combinations of *h* and *k* , and choose the combination that produces the shortest possible confidence intervals while minimizing the coverage error under the null hypothesis . Used in this way, the parameters *h* and *k* become calibration coefficients (Polansky, 2001, page 822). Polansky (2001) reports theortetical results and simulation results that support this approach for the choice of *h* in small sample sizes (N<20). In summary, the bootstrap has become such a important tool, both theoretically and application-wise, that it has led Peter Hall, an emminent figure in the bootstrap research field, to comment, “The bootstrap has had a great impact on the practice of statistics, to the extent that the property of being bootstrappable might well be added to those of efficiency, robustness and ease of computation, as a fundamentally desirable property for statistical procedures in general” (Brown, 2001).

References

Brown, B.M., Hall, P., & Young, G.A. (2001). The smoothed median and the bootstrap. *Biometrika, 88(2),* 519-534.

Chernick, Michael, R. (1999). *Bootstrap Methods: A Practitioner' Guide,* John Wiley and Sons Inc.: New York.

Fernholz, L.T. (1993). Smoothed Versions of Statistical Functionals. In: *New Directions in Statistical Data Analysis and Robustness.* Eds: S. Morgenthaler, E. Ronchetti, W.A. Stahel. Birkhauser Verlag, Bosten.

Fernholz, L.T. (1997). Reducing the variance by smoothing. *Journal of Statistical Planning and Inference, 57,* 29-38.

Hall P., DiCiccio, T. & Romano, J. (1989). On smoothing and the bootstrap. *The Annals of Statistics, 2,* 692-704.

Hoaglin, D. C., Mosteller, F., & Tukey, J.W. (1983). *Understanding robust and exploratory data analysis.* New York: Wiley.

Polansky, A.M. (2001). Bandwidth selection for the smoothed bootstrap percentile method. *Computational Statistics and Data Analsysis, 36,* 333-349.

Polansky, A.M. and Schucany, W.R.(1997). Kernel Smoothing to Improve Bootstrap Confidence Intervals. *J.R. Statist. Soc. B, 59(4),* 821-838.

Polansky,A.M. (2000). Stabilizing bootstrap-t confidence intervals for small samples. *The Canadian Journal of Statistics, 28,* 501-516.

Silverman, B.W. (1986). *Density estimation for statistics and data analysis.* Chapman and Hall, London.

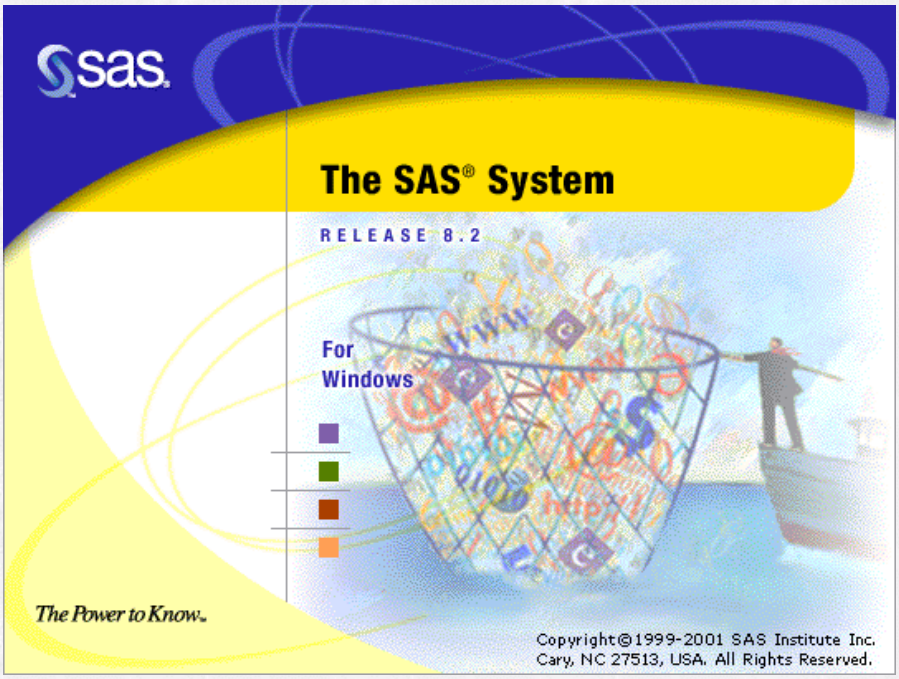
Silverman, B.W., & Young, G.A. (1987). The bootstrap: To smooth or not to smooth. *Biometrika*, 74, 469-479.

Research and Statistical Support
University of North Texas

SAS Corner

By Dr. Karl Ho, Research and Statistical Support Services Manager

What's new in SAS 8.2? - Publishing in Portable Document Format*



Portable Document Format (PDF) is one of the most popular publishing formats on the Web. The benefits are many. You can post a PDF file on a site and let others download it and read it in the free Adobe Acrobat reader. Since the files are platform-independent, they are portable to and readable in any machines. Another advantage of the PDF files is printer-readiness and the files are not subject to any corruption or post-production editing. All content, formats, and fonts are retained in the file. Creating PDF files used to require Adobe Distiller. Until SAS 8.2.

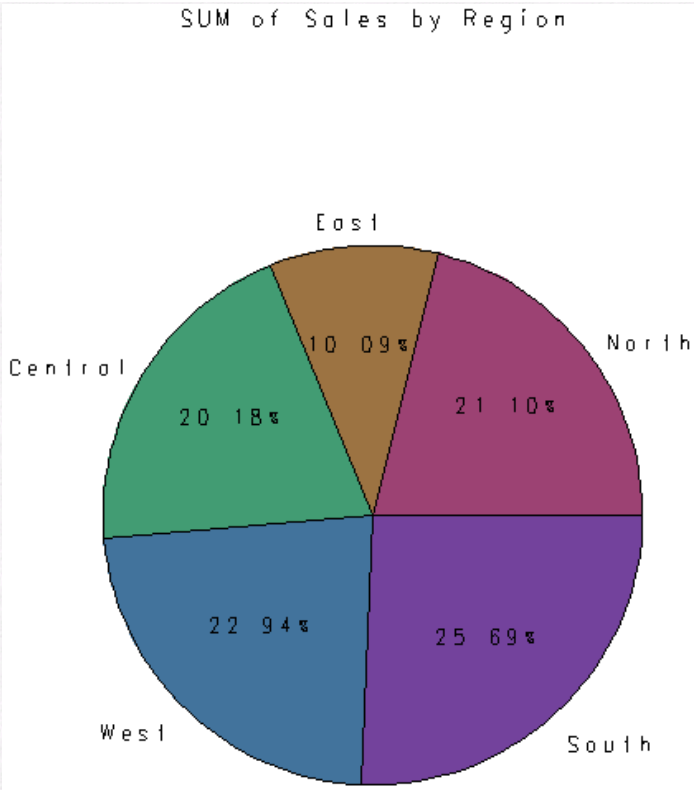
The newest version of SAS is equipped with two methods to generate SAS output in PDF files. Its new device drivers can directly export graphs into a separate PDF file. On top of that, the Output Delivery System (ODS) is enhanced with more features that format and manage the output into PDF files. This method allows more control on the formatting and other aspects in a PDF file such as author information, bookmarks, etc. Let's start by examining the PDF output using the direct export method and ODS.

I. Native Device Driver: PDF and PDFC

This method is simple and very easy to apply. Just specifies the device driver DEVICE=PDF (or PDFC) in the GOPTIONS statement before running the PROC GCHART procedure, just as follows:

- ```
  FILENAME output "path:pie.pdf";
  GOPTIONS RESET=ALL DEVICE=PDFC GSFNAME=output GSFMODE=REPLACE;
  /* Graphics procedure goes here */
  RUN;QUIT;
  ```

The FILENAME statement specifies the location and name of the output file. The DEVICE= option in the GOPTIONS statement specifies a color PDF named pie.pdf be created. The following is the original SAS graph.
  ```



Check out the PDF output: Black and White | Color . Download the free Adobe reader at http://www.adobe.com/acrobat/readstep.html.if it is not available at your machine Other charts in PDF files:

Contour plot
3-D Block
Bar chart

II. Using ODS

ODS allows more control over the format and subsidiary information of the PDF output file, including:

- author's name
- title
- keywords
- orientation (landscape or portrait)
- fonts
- margins
- bookmarks

The general syntax for ODS PDF setup is:

```
ODS PDF FILE="filename.pdf";
/* Procedures go here */
 RUN;QUIT;
 ODS PDF CLOSE;
```

The following program modified from a SAS sample program generates a multi-page report mixed with SAS output and charts:

```
data sample;
length Season Region $12.;
do Season='Spring','Summer','Fall','Winter';
do Region='North','East','South','Central','West';
Sales=ceil(ranuni(0)*10);
output;
end;
end;
run;

/***Using the ODS PDF destination to create output ***/
options orientation=landscape;
goptions reset=all ftext="Times";
pattern1 value=solid color=cx994477;
pattern2 value=solid color=cx997744;
pattern3 value=solid color=cx449977;
pattern4 value=solid color=cx447799;
pattern5 value=solid color=cx774499;
ods pdf file='c:\temp\multpage.pdf'
AUTHOR="Karl Ho"
KEYWORDS="Vbar, PROC FREQ, PRINT, PDF"
SUBJECT="Sample PDF output"
TITLE="Sales report"
STARTPAGE=on;

ods listing close;
ods proclabel="Sales Volume";
title1 "Sales Data";
proc print;
run;
ods proclabel="Sales by Region";
title1 "Sales by Region";
proc freq;
run;
ods proclabel="Sales Charts";
title1 'Summer and Winter Sales';
proc gchart data=sample;
where season in('Summer' 'Winter');
vbar3d region / sumvar=sales discrete group=season
patternid=midpoint cframe=cxe0e0e0
description="Summer and Winter"
midpoints="North" "East" "Central" "West" "South";
run;quit;
ods proclabel="Sales Charts";
title1 'Spring and Fall Sales';
proc gchart data=sample;
where season in('Spring' 'Fall');
vbar3d region / sumvar=sales discrete group=season
patternid=midpoint cframe=cxe0e0e0
description="Spring and Fall"
midpoints="North" "East" "Central" "West" "South";
run;quit;
ods pdf close;
ods listing;
```

Click here to view the output.

The beauty of the new PDF output method is its simplicity. It is extremely easy to use and add on to an existing program. One can create a sample program and change the output location and filename for every new report. It is ideal for Web publishing since the PDF file is platform- and browser-independent, i.e. regardless Netscape or Microsoft Internet Explorer, as long as the Adobe Acrobat Reader or plug-in is installed. And it is free, no additional proprietary software is needed. A caveat is the PDF output method is primarily designed for SAS graphics. It does not work in all text output procedures (e.g. PROC REPORT). For some of these procedures, some fine-tuning may be needed in order output can be ported into the PDF file. So far, I've encountered no problem in generating output using most procedures. Again, your mileage may vary. Good luck PDFing.

* Sample program and materials are extracted from the SAS Technical Report TS-659 (http://ftp.sas.com/techsup/download/technote/ts659/ts659.html)

Network Connection

By Dr. Philip Baczewski, Associate Director of Academic Computing

Your rights online: eroding away?

Those nice folks at the Recording Industry Association of America (RIAA) are at it again. You might remember them as the Internet bullies extraordinaire, who managed to beat lowly Napster into litigious submission and cow colleges and universities everywhere into enforcing their claims of intellectual property control. It is not surprising then, that in the recent flurry of legislation to make us all safe from the civil liberties and rights that we have established over the last 225 years, the RIAA has tried to slip in their own clause giving them carte blanche to break into or impair any system that they feel has violated their intellectual property ownership (see, http://wired.com/news/conflict/0,2100,47552,00.html).

One version of the amendment language proposed by the RIAA is documented as follows (see http://www.wartimeliberty.com/article.pl?sid=01/10/14/1756248):

> 'No action may be brought under this subsection arising out of any impairment of the availability of data, a program, a system or information, resulting from measures taken by an owner of copyright in a work of authorship, or any person authorized by such owner to act on its behalf, that are intended to impede or prevent the infringement of copyright in such work by wire or electronic communication; provided that the use of the work that the owner is intending to impede or prevent is an infringing use.'

In other words, "RIAA: if we think you are using our property without our OK, we have the right to disrupt your electronic communication and you can't do a darn thing about it."

The amendment did not make it into the legislation, however, this does raise some interesting questions about rights to online privacy and attitudes to online information resources. The fact that such cavalier language would be proposed should raise eyebrows everywhere. The above is equivalent to "since we think you illegally copied that CD, we're going to burn down your house to prevent you from using it or making further copies, and you have no recourse." Far fetched? I think that there would be great public outcry if the latter example were proposed, but what the electronic version proposes is to protect a copyright owner for action which impairs the function of an information system, its programs, or its ability to make data available. This is the electronic equivalent of carte blanche for a torch through the window.

Another example of this disparate treatment of Internet resources is the FBI's reported "Carnivore" system. According to Wired magazine (http://www.wired.com/news/politics/0,1283,46747,00.html), "The FBI's controversial Carnivore spy system, which has been renamed DCS1000, is a specially configured Windows computer designed to sit on an Internet provider's network and monitor electronic communications. To retrieve the stored data, an agent stops by to pick up a removable hard drive with the information that the Carnivore system was configured to record." We take for granted that we will be free of such generalized "shotgun" surveillance of our daily lives, yet such activity as applied to the Internet has yet to have any final disposition and outside of the

technical community, has generated very little public outcry.

Why should we care?

Why should we care about such matters of electronic surveillance? Well, there's that longstanding tenet of "innocent until proven guilty" that has been such a foundation of our "American" way of life and the individual liberties it provides. Beyond that, though, is the fact that so much of our lives is now extending to the online world and the resources it provides us. These are crucial times for determining whether that online world will be an extension of the society in which we place so much pride, an additional arena of individual achievement and free flow of the commerce of ideas. Or, will it deteriorate into a realm of constant suspicion and accusation, of suppression and intimidation, and of inhibition of ideas and innovation.

These are not just questions for the technical "elite" or policy and law makers. Anyone who has a stake in the continued development and maturation of the Internet should familiarize themselves with issues of online privacy and electronic communication. Such issues deserve a greater public hearing and should be debated at much greater length before legislation is enacted effecting online freedom. In higher education, we are making a substantial investment in the online world. Just as libraries are the foundation of education, the Internet has the potential to provide universal access to education. It is our future. Who will determine what that future will be?

Link of the Month

Each month we highlight an Internet, USENET Special Interest Group (SIG), or similar mailing list(s) or Website(s).

Since the items we highlight here almost always have some sort of Web component these days, and sometimes ONLY have a Web component, this feature will henceforth be called "Link of the Month," rather than "List of the Month." -- Ed."

TDH Texas Department of Health

The way things are going these days, it probably wouldn't hurt to bookmark this site (http://www.tdh.state.tx.us/default.htm) and check it on a regular basis. Besides the more mundane things one might expect from such a site (birth/death records, grants, funding, laws . . .), there is now a section called "Bioterrorism Preparedness." This area currently has three sub-areas:

- TDH News Release: Guidelines for Handling Letters, Packages -- Contains:
  - Steps for handling a suspicious unopened letter or package.
  - Steps to follow if powder from a suspicious envelope or package has spilled out.
  - Instructions for incidents where aerosolization of a biological agent is suspected.
- TDH Bioterrorism Web Page -- Educational Site, contains fact sheets, FAQs.
- TDH Bioterrorism Radio News Release -- Just like it's name implies.

WWW@UNT.EDU

A New Method for Publishing and Editing Personal Web Pages

By Dr. Philip Baczewski, Associate Director of Academic Computing

As of October 1, Academic Computing has upgraded the personal Web page service found at http://people.unt.edu/. This upgrade was done to expand access to Web page publication and to use more current technology for publication and maintenance of those pages. Previously, personal Web page files were maintained on the jove.acs.unt.edu UNIX system. Now people.unt.edu is an independent server and no longer requires a jove account for Web page publication. For existing pages, we copied Web page files from jove to the new server. It is important to note that any changes made to files on jove will no longer be reflected on the people.unt.edu site.

Personal Web sites can be created and maintained using tools such as Netscape Composer. A detailed description of this process is found at http://www.unt.edu/webinfo/tutor/compub.htm. Web page files can be deleted using a new Web page management facility of the UNT Internet Services Account management page (http://people.unt.edu/manage).

The new Web server also supports a protocol named DAV, also known in Windows as "Web Folders." The DAV protocol provides direct access to add, move, or delete Web files and folders. More information about DAV and DAV software can be found at http://www.unt.edu/webinfo/tutor/webdav.htm. **Note** that it is not recommended that Web Folders be used on any Lab or public computers, since the folder access is maintained until the PC is rebooted and the password may be automatically remembered by that Windows system.

If you have questions about the upgraded Web publishing server, please direct them to the UNT Computing Center Helpdesk (940-565-2324 or helpdesk@unt.edu).

Please see "WebDAV and You" in this issue for more information on WebDAV, also.

Page One

Campus Computing News

Update on SmartForce CBT

Lab-of-the-Month: SCS

FrontPage and Dreamweaver

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Your First ColdFusion Application

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RSS Matters

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The Network Connection

Link of the Month

WWW@UNT.EDU

Short Courses

IRC News

Staff Activities

Subscribe to Benchmarks *Online*

Short Courses

By Claudia Lynch, *Benchmarks Online* Editor

ACS Short Courses are now in high gear. Please consult the Short Courses page to view the schedule. There are still openings in all the classes left to be taken this semester: SPSS, S-Plus, New Technologies for Survey Research, FrontPage 2000, Beginning SQL, Introduction to Macromedia ColdFusion, and Getting Started with Dreamweaver 4.

In addition to the above courses, the Campus Wide Networks (CWN) group in the Computing Center will be conducting a **Basic GroupWise Seminar** on Wednesday October 24, from 10 a.m. until Noon. **To register for the GroupWise class only**, go to http://www.unt.edu/hr/training/treg.htm or E-mail Bhavna Vaswani at bvaswani@unt.edu.

Customized Short Courses

Faculty members can request customized short courses from ACS, geared to their class needs. Other groups can request special courses also. Contact ACS for more information (ISB 119, 565-4068, lynch@unt.edu).

Especially for Faculty and Staff Members

In addition to the ACS Short Courses, which are available to students, faculty and staff, staff and faculty members can take courses offered through the Human Resources Department, the Center for Distributed Learning, and the UNT Libraries' Multimedia Development Lab. Additionally, the Center for Continuing Education and Conference Management has a new program for interdepartmental training in business computer literacy. These classes are offered for a fee but discounts are given to those associated with UNT, and Inter-departmental Orders are accepted.

Center for Distributed Learning

The Center for Distributed Learning offers courses especially for Faculty Members. A list of topics and further information can be found at http://www.unt.edu/cdl/training_events/index.htm The center also offers a "Brown Bag" series which meets for lunch the first Thursday of each month at Noon in ISB 204. The purpose of this group is to bring faculty members together to share their experiences with distributed learning. One demonstration will be made at each meeting by a faculty member with experience in distributed learning. More information on these activities can be found at the Center for Distributed Learning Web site.

UNT Libraries'

The UNT Libraries' Multimedia Development Lab has also offered free training to all University of North Texas faculty and staff in the basics of FrontPage and information architecture in the past. For more information see

http://www.library.unt.edu/media/services.htm#Distributed.

Technical Training

Technical Training for campus network managers is available, from time to time, through the Campus-Wide Networks division of the Computing Center. Check the CWN site to see if and when they are offering any training.

UNT Mini-Courses

These are a variety of courses offered, for a fee, to UNT faculty, staff and students as well as the general public. For additional information surf over to http://www.unt.edu/ccecm/cont_ed/Minicourse/Courses/UNT_Minicourse_Page.htm .

Alternate Forms of Training

Many of the General Access Labs around campus have tutorials installed on their computers. For example, the College of Education recently acquired some Macromedia Tutorials for Dreamweaver 4.0, Flash 5.0 and Fireworks 4.0.

The Training Web site has all sorts of information about alternate forms of training. Training tapes, Computer Based Training (CBT) and Web-based training are some of the alternatives offered. Of particular interest are courses available via SmartForce (formerly CBT Systems). See http://www.unt.edu/smartforce/ for more information.

There are also handouts for computer training on the following topics:

- GroupWise 5.2 Handout for Win95/NT
- FAQ for GroupWise 5.2
- Computers - Back to the Basics
- Introduction to Windows 95 /98/NT
- Introduction to Word 97
- Advanced Word 97 - MailMerge It Together
- Introduction to PowerPoint 97 (Creating a Slide Show)
- Introduction to Remedy (THE Call-Tracking Program)
- AND, the award winning Introduction to Excel 97

Adobe Acrobat Reader Format only for the following:

- Introduction to Microsoft Word 2000
- Introduction to Microsoft Excel 2000
- Creating a Slide Show with PowerPoint 2000
- Using Netscape Communicator & the UNT Home Page

Use the Internet to search for answers to Microsoft Office problems. See http://www.zdnet.com/zdhelp/filters/office/ December 1999's "List of the Month" offers links to free Microsoft Word and Excel information also.

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IRC News

Minutes provided by Sue Ellen Richey, Recording Secretary

IRC Regular and Ex-officio Voting Members: *Judith Adkison, College of Education; Ginny Anderson, Fiscal Affairs; Donna Asher, Administrative Affairs; Craig Berry, School of Visual Arts; Cengiz Capan, College of Business, GALC; Bobby Carter, UNT Health Science Center; Christy Crutsinger, Faculty Senate; Jim Curry, Academic Administration; VACANT, Student Association; Duncan Engler, University Planning Council; Don Grose, Libraries; Jenny Jopling, Instruction Program Group; Joneel Harris, EIS Project Group; Elizabeth Hinkle-Turner, Standards and Cooperation Program Group; Abraham John, Student Affairs; Christine Mitchamore,Graduate Student Council; Ramu Muthiah, School of Community Services; Jon Nelson, College of Music; Robert Nimocks, Director, Information Technology,UNTHSC; Patrick Pluscht, Distributed Learning Team; Mark Rorvig, Research Program Group (Acting Chair); Paul Schlieve, Communications Program Group; Kathleen Swigger, College of Arts and Sciences; Philip Turner, School of Library and Information Science and University Planning Council (Chair, IRC); Virginia Wheeless, Chancellor for Planning.* ***IRC Ex-officio Nonvoting Members:*** *VACANT, Telecommunications; Charles Andrews, GALMAC; Bill Buntain, Computing Center Networking; Jim Curry, Microcomputer Maintenance Shop; Richard Harris, Computing Center and University Planning Council; Coy Hoggard, Computing Center/Administrative; VACANT, UNT Health Science Center; Maurice Leatherbury, Computing Center/Academic; Sue Ellen Richey, Computing Center (Recording Secretary). [As of 9/2001]*

September 18, 2001

VOTING MEMBERS PRESENT: RICHARD HARRIS, Representing and Chairing for Philip Turner, DON GROSE, ELIZABETH HINKLE-TURNER, JUDITH ADKISON, JONEEL HARRIS, CRAIG BERRY, PATRICK PLUSCHT, JIM CURRY, DONNA ASHER, PAUL SCHLIEVE, ROBERT NIMOCKS, JON NELSON, MARK RORVIG, CENGIZ CAPAN, RAMU MUTHIAH **NON-VOTING MEMBERS PRESENT:** MAURICE LEATHERBURY, COY HOGGARD, CHARLES ANDREWS, SUE ELLEN RICHEY (Recording Secretary) MEMBERS ABSENT: JENNY JOPLING, VIRGINIA WHEELESS, PHILIP TURNER, KATHLEEN SWIGGER, DENNIS ENGLER, BOBBY CARTER, GINNY ANDERSON, BILL BUNTAIN **GUESTS:** JENNIFER LAFLEUR, LOU ANN BRADLEY, WILL CLARK

The minutes of the July 17th meeting were approved.

Information Resources Steering Committee revisions

Richard Harris reported that the Information Resources Steering Committee has not met since the July meeting of the IRC but that there has been a re-structuring of the steering committee meetings. It will now be chaired by President Pohl. A monthly President's Staff Meeting is being initiated and, in addition to the Vice Presidents, will also include Philip Turner, Richard Harris and Joneel Harris.

Richard Harris also reported that a request was made to Dr. Turner to add a representative to the IRC from the System Center Dallas. The Strategic Planning Committee approved the addition to the council. This addition and other changes have been made to the IRC charge and a draft of those revisions is being reviewed by Vice President Diebel. After approval by the Vice President, the new Charge will be brought before the IRC for official approval. The Chair asked for a vote to accept the addition of a new representative from the System Center

Dallas. Mark Rorvig so moved; Paul Schlieve seconded and the additional representative was approved.

Richard Harris noted that other revisions to the IRC Charge which have been made are: 1) revise titles of positions; 2) add representative from System Center; 3) change names of Program Groups to Planning Groups; IRC reports to the IR Steering Committee, which is chaired by UNT President; 5) define Planning Groups and state that the Chair of each Planning Group will be representative to the IRC and groups are expected to meet at least quarterly; and 6) General Access Lab Committee's relation to the IRC. When revised charge is approved by the Vice President, Richard Harris will email it to the council for review and it will be on the agenda for discussion and possible vote at the October meeting.

DCSMT

Maurice Leatherbury reported that at the last DCSMT meeting Mike Wright told the group about the changes that will take effect for the Microsoft Campus Agreement after the current agreement expires August 31, 2002. There will be an approximate 50% increase in the price next year and the new program will not allow operating system work-at-home rights, and license restrictions will become more strict about use of application software at home.

Maurice also reported that the requested $760,000 in TIF funds were granted to UNT, and proposed projects can now go forward. Dr. Grose announced that the Libraries received over $600,000 in TIF funds, as well.

Communications Program Group

Paul Schlieve reported for the Communications Program Group that the group is reviewing an internet connectivity proposal from Verizon. The Group has also been looking into a proposal for sharing bandwidth with the Denton ISD and co-managing a router at City Hall, but it has been determined that the ISD did not have enough money budgeted to handle the cost of doing so. The Program Group continues to work on technical aspects of multi-casting, implementation of wireless networks and the completion of the building wiring project.

EIS Project Group

Coy Hoggard reported for the EIS Project Group that two RFPs have been released; one for the application software, for which responses are due Sept. 26; and one for implementation services, for which responses are due October 5th. Coy explained that it is not necessary to do an RFP for computer equipment. He stated that most likely Sun equipment will be used, since there is a lot of expertise already in the Computing Center for using that equipment.

Richard Harris mentioned that there is a Center for Excellence Program through Sun Microsystems in which UNT may participate. Coy said that Sun is proposing that UNT participate in this which would make the campus eligible for big discounts in the purchase of Sun equipment.

Research Program Group

Mark Rorvig announced for the Research Program Group that he has issued an invitation to all schools, colleges and some departments to appoint a representative to that Program Group. He stated that an issue that this group needs to deal with is computer security and server configuration management. Maurice Leatherbury noted that a new position of a

Central Computing Security Manager has been established in the Computing Center; and interviews are now being conducted. Paul Schlieve commented that it would be very helpful to have a set of recommended standard services for servers and information regarding those services which would present certain security risks.

Standards & Cooperation Program Group

Elizabeth Hinkle-Turner announced that Paul Hons from COE and Scott Krejci from Music are new members of the Standards & Cooperation Program Group. Elizabeth reported that they have finished a draft of the Security Policy 3.6 and are working on Security Standards 3.7. They will meet next week and hope to finish the Standards document at that time. Next they plan to begin review of the Data Integrity Policy 3.8 and plan to bring all three policies before the Council in November.

Distributed Learning Team

Patrick Pluscht reported for the Distributed Learning Team that they hosted the North Texas Regional Group of Texas Distance Learning Association; and discussed the conference they will be hosting April 2-4 for the state and region, dealing with distance learning, at the Weston Beechwood near Alliance Airport. William Janklow will be the keynote speaker at that conference.

IRC Schedule changes, other business

The meeting schedule for FY2002 was discussed and it was suggested that the December meeting be changed to December 11th, and the May meeting be changed to May 7th. The Recording Secretary will check these suggested changes with the Chair's calendar and send out a revised schedule to members.

It was announced that there will be an Internet2 meeting on October 1-4, 2001 in Austin. UNT has three free places at that meeting and anyone interested in attending can see the agenda and register on-line. Richard Harris asked that members send him an email if they are interested in attending. Both Richard and C.R. Chevli of the Computing Center plan to attend.

Elizabeth Hinkle Turner announced that visitors from SMU will be coming to UNT to look at the general access lab system here as they begin to plan for their own. Elizabeth plans to show them the dorm labs, the MUSIC lab, ACS, the Adaptive Lab, COE's and COBA's lab. It was suggested that the visitors be shown the open computers in the ESSC as well as the open lab in that building.

IRC Meeting Schedule

The IRC generally meets on the third Tuesday of each month, from 2-4 p.m., in the Administration Building Board Room. From time to time there are planned exceptions to this schedule. This fiscal year, the December meeting has been changed to December 11th, and the May meeting to May 7th. All meetings of the IRC, its program groups, and other committees, are open to all faculty, staff, and students.

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Transitions

The following are new employees:

- **Aenequa Sanders**, Tape Librarian, Computer Operations (part-time).
- **Rita Barello,** CPU Operator (part-time).
- **Garvii Thomas**, Statistical Consultant, ACS Research and Statistical Services(part-time).
- **Richard Anderson**, Computer Systems Manager, Security and Administration Team.

Changes

- **Mohammad Khan**, moved from UNT Fiscal Data Systems to DataBase Central Programming Systems Team (DB-CPST).

Awards, Recognition

There are tipsters in our midst! **Barbara Heffley**, UNT/HSC Fiscal Data Systems Programmer, and **Samantha Moss**, part-time Clerical Assistant in Administrative Services, were recognized for making suggestions in the September, 2001 issue of the *Human Resources Newsletter*, and **Richard Harris**, the boss, was recognized for his suggestions in the August 2001 *Human Resources Newsletter*.

The following people and groups were honored at the Staff Convocation, October 10:

- **Allen Akers,** Voice & Web Strategic Applications Programmer/Analyst, received a Staff Contribution Award.
- **Karl Ho**, Research and Statistical Support Services Manager, received a Staff Contribution Award.
- **The Computing Center**, received an Outstanding Department Award.

The following people have been nominated as Soaring Eagles and will receive their award at the President's Staff Sack Lunch on October 22:

- **Christopher Cofer**, ACS UNIX Systems Administrator, was recognized for helping "during some technical transitions."
- **Jana Crews**, Student Services Data Systems Programmer/Analyst, and **Barbara Heffley**, UNT/HSC Fiscal Data Systems Programmer, "helped make fall fee payment processes much easier for students and staff by completing the programming for the prior term charges project."

- **Austin Laird**, Computer Support Specialist, UNT Central Web Support, "worked late hours and weekends to make sure that everything was a 'go' for classes supported by WebCT after the summer upgrades."
- **Rong Wang**, UNT/HSC Payroll/Personnel Data Systems Programmer/Analyst, was recognized for helping to get the new fiscal year payroll information out to all with such a short turn-around time.
- **Ben Howard**, Network Manager Assistant, and **Brenda Kirk**, Computing Center Network Manager, helped duplicate "computer based training CDs for faculty, staff, and students who needed them this summer."
- **Allen Akers**, Voice & Web Strategic Applications Programmer/Analyst, is "always helping out in a crunch! Your willingness to assist others is a wonderful thing."

Actually, his official title is "Associate Vice President for Computing and Communications Services."

Campus Computing News

By Dr. Maurice Leatherbury, Senior Director of Academic Computing

Enterprise Information System Selection Status Report

As most of you probably know, UNT is currently in the process of selecting a new "Enterprise Information System," (EIS as we've started to call it.) This system will eventually replace virtually all of the aging administrative systems on campus over the next three or four years, at which time our IBM mainframe computer will be decommissioned and we'll no longer be referring to SIMS, HRMIS, NOBIS, CEATS, and all those other acronyms we've grown to love. The new system will truly be a "UNT System," because it will be shared by the Health Sciences Center and the Denton campus (and of course the future UNT Dallas.)

Where we stand

Here's where we stand in the process of making a decision about the system or systems to which we'll be migrating:

In August we released a Request for Proposal for the new system software, with a due date of mid-September. The deadline for responses was extended to September 29th because of the terrorist attacks in the Northeast, and we've received three responses from vendors of software designed to provide solutions to higher education institutions such as ours. The three responding vendors were Oracle, Peoplesoft, and SCT.

Several groups of users of administrative systems at both the Health Sciences Center and here on the Denton campus have been poring over the responses to the RFP. This is not a trivial task because there each vendor responded to about 20 general questions as well as nearly 3,000 very specific questions about their software's ability to meet our needs. If you're interested, you can see the RFP as well as much other information about the EIS, including the membership of the various committees, at the site dedicated to the project (http://www.unt.edu/eis/EIS_Homepage.htm).

Concurrently, we've released and have received responses to an RFP for "implementation services" for the new software and hardware systems we'll be purchasing. 12 vendors that provide expert help on implementing Oracle, Peoplesoft, and SCT have replied to the RFP, and their responses will be evaluated in conjunction with the software so we can make informed decisions about the combination of software and implementation of the software.

The rather ambitious schedule for the evaluation and selection of the new software system is that by the end of October we'll have made preliminary decisions about which software vendors we wish to investigate further. Then the evaluators will contact reference sites, visit other users of the systems, and get structured (by us) demonstrations of the capabilities of the systems during the

remainder of this calendar year. By mid-January 2002 we intend to have made a decision about which system or systems we will recommend to the Board for purchase, including implementation services vendors. We have explicitly told the vendors that we may purchase "best of breed" products (the student system from Vendor A, the human resources system from vendor B, for example,) so it's possible that UNT will end up with contracts with more than one vendor. By late February, we hope to have wrapped up a contract or contracts and can start the process of acquiring the software and hardware necessary to run the new system.

Update on SmartForce CBT

By Dr. Elizabeth Hinkle-Turner, Student Computing Services Manager

The response to the SmartForce Computer Based Training Campus system has been extensive and positive. Students, faculty, and staff are using the resource often and offering great suggestions for additional courses and services. UNT community members not yet familiar with the online training offered via this service are encouraged to visit the UNT SmartForce site.

CDs available

I would like to take this opportunity to update University users on additional services and options in SmartForce online training. For those who wish to use SmartForce at home but have a slow online connection, CDs containing course units can be requested. Currently I have CDs ready for the study of Windows 2000 Professional and Server, UNIX, Oracle 8i, and several other topics. Additionally, I have collaborated with Suzanne Gravois at the UNT Health Science Center so that HSC faculty, staff, and students can request CDs of courseware from her. Courseware CDs should be requested for at home use only; when on campus, users should access the SmartForce Campus System via the Web.

More Choices

Currently I am reviewing the course catalog from SmartForce in anticipation of adding a few more choices to the system as our budget will allow. Those involved with the new EIS project and migration will be especially interested in the expanded curriculum offered in database development and management and Oracle-based systems. Interested faculty, staff, and students may contact me for a copy of the catalog and I welcome E-mailed suggestions for new course offerings. Several requests have been made for expanded curriculum in C and C++ programming and I am currently studying the possibilities in this area as well.

Some people have been a bit confused about how to log on to SmartForce and what courses are available. I encourage everyone to look at the SmartForce Website because most questions you might have are answered there. However, any additional queries which are not covered at the site may be directed to me at ehinkle@unt.edu.

Lab-of-the-Month: The School of Community Service General Access Lab

By Dr. Elizabeth Hinkle-Turner, Student Computing Services Manager

Students are hard at work in the SCS General Access Lab

Primarily serving the School of Community Service and the School of Merchandising and Hospitality Management, the General Access Lab located in Chilton Hall, Rm 255 is dedicated to providing for the computing needs of the students, faculty and staff of the these areas of study as well as the UNT community as a whole. Manager Jackie Stanczyk emphasizes that the lab strives to provide the best technology available for users' academic success and recent computer upgrades in the facility prove this point. All 45 of the labs' computers are Pentium III 1 gHz machines. Interestingly, however, this lab also has a working typewriter available for use! (sometimes you still need a typewriter; now you know where to find one!)

The School of Community Service and School of Merchandising and Hospitality Management have over 2,000 students so the lab has a large number of customers. Somewhat hidden in the central hallway of Chilton, however, it also offers a quiet environment for doing serious study. Personnel are friendly and helpful.

This lab is also reserved for teaching purposes and Denton community members can benefit from the Continuing Education "Minicourses" offered at this facility. Covering topics such as *Introduction to Home Computing, Microsoft Word,* and *Microsoft Excel* these courses are taught by various experienced UNT faculty and staff throughout the year.

To learn more about the General Access Lab located in Chilton Hall, see the informative facility Website located at www.scs.unt.edu. To learn more about the many continuing education minicourses in computing taught there see www.unt.edu/ccecm/cont_ed/Minicourse/Courses/UNT_Computers.htm.

FrontPage and Dreamweaver

By Jon Ingle, UNT Central Web Support

Over the past few years we have seen an explosion in the uses of the Internet. From E-mail, eBay and e-commerce to WebPages, Webcams and WebCT, all sectors of society have been touched by e-frenzy. With this explosion has come the desire for the common person to make their virtual presence known. Since the beginning, HTML has been the lingua franca for publishing Web content. Although HTML is by no means a complex language, many people thought that it would be helpful to have a visual way of creating Web content so that you can see how things are shaping as you work. Enter WYSIWYG. This lengthy acronym stands for What You See Is What You Get and it is the philosophy behind the HTML editors on the market today. Although there are plenty of choices out there (even free ones), this article will only focus on Microsoft's FrontPage and Macromedia's Dreamweaver.

Microsoft FrontPage

FrontPage will be first since it is the one that has been most widely used on campus. FrontPage's strength is in it simplicity for the user. It is considered better for those new to HTML and WYSIWYG editors. Firstly, since most people are very accustomed to the workflow of Microsoft's Word, the transition to FrontPage is quite seamless: the layout is like a beefed-up Word application. All of the same commands and the same icons are present. Secondly, FrontPage has what is called FrontPage Server Extensions.

Going into the details of server extensions is not within the scope of this article, but rest assured that their presence is to make the user's task of creating Web pages easier. For example, creating forms that collect information from users is a cinch. All that is required is to drag-and-drop form elements into the page, set a few settings about how to retrieve this information and voilà! it is done. Also, in FrontPage 2002 (the newest version), database features have been added to allow the creation of dynamic content. All of this is managed invisibly by the beloved extensions.

Although there are some downsides to FrontPage, because of our licensing agreement [1] with Microsoft, we are not allowed to use the software to express views that would "disparage" Microsoft or any of their products. Since Claudia Lynch uses FrontPage to post these articles on the Web, I suppose that I am not able to talk about any of these downsides lest I would breach the agreement. Hopefully it is within the scope of the agreement to say that all products have different strengths and weakness. FrontPage is not exempt from such realities and actually some of its strengths are also some of its weaknesses. For instance, its ease of use makes it a bit unwieldy to do more complex tasks. Another is, because of its likeness to Word, it flows like a text editor. This asset becomes problematic when higher level editing is needed (especially with graphics), since Web documents are markedly different from text documents. These differences between Web and text documents should be reflected in the tools that create them. Dreamweaver is one such editor that has fashioned itself to be

an appropriate tool for the Web development task.

Macromedia Dreamweaver

As mentioned in the previous paragraph, Dreamweaver is a tool that has been created with the Web developer in mind. One such feature is the Layout View that enables the user to create tables visually. Since tables are mainly used for layout purposes in HTML, it would make sense to create tables visually.

The tool works by first drawing a square that will house all of the cells. For each cell, another square is drawn inside the table. It is possible to create quite complex layout configurations quickly and painlessly. Another plus is its seamless integration with Flash and Fireworks that allow animation and graphic editing respectively. Dreamweaver even provides functionality to add flash components (such as text and buttons) that can quickly enhance a site. Lastly, is the Code Reference Panel. This tool gives access to three O'Reilly reference modules for JavaScript, HTML and cascading style sheets. For those of us that have difficulty remembering which tag does what, this is an invaluable asset.

Many hail Dreamweaver as the best WYSIWYG editor on the market. While this might be true, there still are certain factors that need to be considered. The advantage that FrontPage has over Dreamweaver is its straight-forwardness. FrontPage does not require any prior HTML or site architecture knowledge. It handles most of the work for you. For those that want a good tool with a shallow learning curve to create simple sites, FrontPage is the way to go. Dreamweaver is a more powerful tool that does require a bit more learning and effort. By saying this I do not want to scare people away from Dreamweaver. While it takes a bit longer to learn, there is great reward for the time spent.

Training Opportunities

As you can see, both tools have their place in meeting your Web development needs. The best approach in deciding which one to choose is to assess your needs and pick the tool that is most appropriate. Also, Charity Beck and I (Jon Ingle) will be teaching short courses for both products through the fall. If you can't decide which one is best for your needs, either sign up for one or both of the short courses or email us (cbeck@unt.edu and joningle@unt.edu) with your questions. The URL for information about these short courses is http://www.unt.edu/training/shortcrs.htm

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[1] The FrontPage licensing agreement states, "You may not use the Software in connection with any site that disparages Microsoft, MSN, MSNBC, Expedia or their products or services" (p. 2)

WebDAV and You

This article is particularly germane to those who have personal Web pages here at UNT. Please see "A New Method for Publishing and Editing Personal Web Pages" in this issue for more information. -- Ed.

By Charity Beck, UNT Central Web Support

WebDAV is a network protocol that allows Web developers to manage files on remote Web servers. So what does this mean to you? It means that you can publish your Web, using Web Folders or My Network Places (for Windows users) and a WebDAV client called Goliath (for Mac users). A couple of the benefits of using this method to publish your Web are:

- It's more secure than FTP
- It's as easy to use as a folder on your desktop

You might be wondering how you can get started in the wonderful world of WebDAV. It's easy! If you currently have a Web site, here's how...

WINDOWS 2000 Users

1. Double click on the "My Computer" icon on your desktop;
2. There should be a "My Network Places" link on the left, click on it;
3. You should see an icon that says "Add Network Place";
4. A window opens. At the "Type the location of the Network Place" prompt type in your URL, for example http://www.unt.edu/
5. Click on "Next";
6. It should prompt you for your username/password;
7. At the "Enter Name for the Network Place" prompt you may enter an alias for your Web folder;
8. Click on "Finish";
9. You'll be prompted one more time for your username/password;
10. You may now click and drag the files that are ready to be published to the Web into this folder.

The next time you are ready to publish you won't have to create a new Network place. You will:

1. Double click on the "My Computer" icon on your desktop;
2. There should be a "My Network Places" link on the left, click on it;
3. At this point you should see the one you created before;
4. Double click on it, and your ready to move your files!

WINDOWS 98 Users

1. Double click on the "My Computer" icon on your desktop;
2. Double click on "Web Folders";
3. Double click on "Add Web Folder";
4. A window opens. At the "Type the location to Add" prompt type in your URL, for example http://www.unt.edu/

5. Click on "Next";
6. It should prompt you for your username/password;
7. At the "Enter Name for the Web Folder" prompt, you may enter an alias for your Web folder;
8. Click on "Finish";
9. You should see your organizations Web folder.
10. You may now click and drag the files that are ready to be published to the Web into this folder.

The next time you are ready to publish you won't have to create a new Web Folder. You will:

1. Double click on the "My Computer" icon on your desktop;
2. Double click on "Web Folders";
3. At this point you should see your folder;
4. Double click on it, and your ready to move your files!

Macintosh Users

To Download:

1. Go to http://www.Webdav.org/goliath/#download.

To Install:

1. Double click on the "Goliath 0.7" Installer;
2. A dialog box opens giving information about the product. Click any where on the box to continue;
3. You will be prompted through the installation process.

To Use:

1. Open Goliath by double clicking on it icon;
2. A dialog box opens. Here you will type the URL of the Website you wish to edit;
3. Check the box next to "Use basic authentication";
4. Enter your username, and password;
5. Click OK!

Once you have opened you Web site, you will notice that a new folder has opened on your desktop. It may look like just another folder, but you are actually connected to the remote server. You may now transfer your files by selecting them and dragging them from your local folder to the remote folder. You may also remove files on the remote server by selecting them and dragging them to the Recycle Bin on your desktop.

You may find more information on the WebDAV protocol at http://Webdav.org. If you have question about obtaining a Web site on the UNT server, you may contact me at cbeck@unt.edu.

Your First ColdFusion Application

By Shannon Eric Peevey, UNT Central Web Support

Shannon will be teaching two Short Courses on ColdFusion this semester. Check the Short Course schedule for dates, times, and locations. -- Ed.

Last month, I outlined the procedure that you follow to get started with Macromedia ColdFusion on the University of North Texas campus. We discussed the way to get a Website setup on our ColdFusion server, and how to access that site to add content.This month, I am going to continue our series with the article, "Your First ColdFusion Application."

Start Coding...

If you have contacted me, and/or have your site up and are ready to add content to it, you are ready to start the creation of your first ColdFusion application. The first thing that you need to know, is that you don't need any special tools to create ColdFusion applications. You can write raw HTML, use an HTML editor, etc, and then just manually add the CFML tags later. The other option that is available to you, is buying the Macromedia ColdFusion Studio, which is recommended by Macromedia, (of course...) and which costs $495. This tool is a very nice environment to work in when doing heavy ColdFusion coding, but from a budgetary standpoint, your department must decide between the cost, and the extent of time spent coding ColdFusion. (I think that the Studio is a nice HTML editor, and I use the Studio for all of my coding, but I don't know if it is the right choice for everybody. I **have** found that you should not open WebPages that have been created in another HTML editor, such as FrontPage, in the design view of ColdFusion Studio, because it changes the HTML and costs you a lot of clean-up time fixing it. If you do need to make changes to the format of the page, make the changes manually in the edit screen, but beware!!! Keep a back-up available just in case!)

The second thing you must know, is that it is easy to code in ColdFusion! I know many people on campus that started at the same place that you are, and can now create amazing pages.(Check out http://web2.unt.edu/calendar!) What I mean is, do not be afraid to jump in and try it for yourself.The initial fear of jumping into a new tool is normal, but unfounded. That's why I am here.:-) With one simple example, you will see how easy it is to code in ColdFusion, and how easy it is to send, and remember, information from one page to another. Are you ready?!

In The Beginning...

First, we need a simple page that contains a couple of forms to input data into.

```
<HTML>
<HEAD>
<TITLE>Welcome to the Test</TITLE>
</HEAD>
<BODY>
```

```
<P><FONT SIZE=4 STYLE="font-size: 16pt">
<B>Welcome to the ColdFusion Test Application:</B></FONT></P>
<FORM>
<P><FONT SIZE=3><B> Please enter your name here:
<INPUT TYPE=TEXT NAME="name" SIZE=25></B></FONT></P>
<P><FONT SIZE=3><B> Please enter your telephone here:
<INPUT TYPE=TEXT NAME="phone" SIZE=25></B></FONT></P>
<DIV ALIGN=LEFT>
<P><FONT SIZE=3><B> <INPUT TYPE=BUTTON NAME="submit"
</DIV>
</FORM>
</BODY>
</HTML>
```

Save this page as a *.cfm* file, so that the web server will recognize that the information contained in this page is to be interpreted by the ColdFusion server. You can name it anything you would like, but for this example, we will name it "test.cfm". This is a simple web page that will ask the user to enter their name and telephone number.

To show you how this plain, "boring" HTML page can be transformed into a dynamic page, we will only need to add a little information to our <FORM> tag. We will need to add the attribute METHOD, and set it to "post". This tells the server to send the information contained by the form in the body of the submission, as opposed to sending the information in the URL, as GET would. When you are finish this, you may be asking yourself, "where does the information from this page go?" You know where you want it to go to, but how do you get the server to do that for you...? To solve this problem, we must add the ACTION attribute to the FORM. The ACTION attribute, tells the server where to send the "posted" data, therefore, we must decide on the location of the file which will receive and interpret the data. In ColdFusion, you will enter the name of the target file for this form. In this case, it will be "test2.cfm". (Notice the *.cfm* extension again.) Therefore, the <FORM> tag will be changed from:

```
<FORM>
```

to:

```
<FORM ACTION="test2.cfm" METHOD="post">
```

And that completes the first step in creating our application.

Page Two

Now, we need to write our second page, test2.cfm, and must discuss the syntax of the ColdFusion "language", or scripting tags. These tags, are the language that causes the ColdFusion server to take certain actions. They are very simple, and often mimic the English names for actions that we would like to accomplish with the ColdFusion tag that we are using. For example, <CFINSERT> is the ColdFusion tag that "inserts" data from a web form into a database. <CFUPDATE> "updates" the information in a database, and <CFOUTPUT> "outputs" the data from a source to the screen. You will notice that the tags look like HTML tags, and are actually used in the same way as you would use HTML. You drop them

directly into your HTML code, and when the page is called by a browser, the ColdFusion server interprets them and returns the necessary information to the screen. (This use of HTML-type tags is one of the reasons that many people find CFML, or ColdFusion Markup Language, to be a very simple way to create dynamic WebPages.)

The process of creating the test2.cfm is only slightly more difficult than the creation of the test.cfm file. You will first need to create a new *.cfm* file named test2.cfm. (As with the first file, it can be named anything that you want, but be aware that you need to set the ACTION attribute on test.cfm to point to the name of the new file that we are going to create.) After you have created the file, you will need to add the HTML tags as follows:

```
<HTML>
<HEAD>
<TITLE>This page interprets the data from test.cfm</TITLE>
</HEAD>
<BODY>
</BODY>
</HTML>
```

Because this is an example, you can see that I am only including the most necessary tags to create a working web page. If you sent the results of test.cfm to test2.cfm with the page in this state, you would see nothing but a blank page on the screen, but if you add CFML tags, your web page will become a dynamic page. This being the case, we will now add CFML tags in between the BODY tags. The tags that we will be using are <CFOUTPUT> tags, which allow you to pull information from the posted document, test.cfm, and output the data to the screen. Remember, we will need to open and close these tags just as you would in HTML. After opening and closing the <CFOUTPUT> tags, we will add the variables for our output values, which will be the word *Form*, followed by a period, and then the name of the form element from test.cfm. These words are then surrounded with pound signs, #. (In this example, you will see that they are #Form.name# and #Form.phone# Also, be sure to include the # signs. The ColdFusion server recognizes the variables by the # signs that bracket the variable name and will not work if not included.) When finished, your document will look like this:

```
<HTML>
<HEAD>
<TITLE>This page interprets the data from test.cfm</TITLE>
</HEAD>
<BODY>
<CFOUTPUT>
<H2>#Form.name#</H2>
<H2>#Form.phone#</H2>
</CFOUTPUT>
</BODY>
</HTML>
```

Upload these files to your web site on Web2.unt.edu, and test them in your browser. You should see something like this http://web2.unt.edu/speeves/test.cfm.

In Conclusion...

That is all there is to it! As you can see, it is very simple to do amazing things with ColdFusion. Some of the pages that we have at UNT, are based around this simple retrieve and output data, and you will find that your sites will be much more powerful because of the fact that you are able to remember information from one page to the next. Although... The ability to retrieve and store data is an even greater tool for us to interface with the general public from our sites. That is why we are going to explore the ability of ColdFusion to interface with databases.**That** is where the meat of ColdFusion coding is!

Until next month!! :-)

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