SamplePoint
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Description of the SamplePoint Form Controls

Options on the form menu

"Change Crosshair Color" This item allows the selection of different colors for the crosshair.

"Create Statistics Files" This item generates the output files summarizing the data from the classification of the images.

"Custom Buttons" There are several menu items for creating and loading Custom Buttons. See the help page on Custom Buttons.

"Database Wizard – Create DB" This menu item allows the creation of Databases for use with SamplePoint. See the page on the Database Wizard.

"Dual Monitor"   This menu item turn on a second PictureBox that can be displayed on a second monitor.

"Goto Image" This item allows you to go to any existing image in the Database. You can skip forward or backward to an image.

"Launch SPTracker" This item runs the SPTracker process which will mimic the display in SamplePoint with its own set of zoom levels.

"PreLoad the Next Image" If set to "On", the next image will be preloaded while you work on the current image.

"Select Database" This item allows the selection of the Excel Spreadsheet which contains the database of images to be measured. A Database must be opened before any measurements can be done.

"Select Grid Size" This item allows various grid sizes to be used during the classification of an image. This also gives the option of having the program select random points.

"SnapZoom" This item turns on/off the SnapZoom feature. When this feature is active, the user can define a zoom level that is used each time a new point is used for classification.

"Zoom Adder" This item lets the user select the addition to the zoom level for the second PictureBox. This item is not visible till the "Dual Monitor" option is turned on.

Help on the form menu

Contents opens this help file.

Check for Update checks the website for a possible update.

Download Acrobat Reader goes to the web site to download the reader which is used to read the Help Files.

About opens the about Message Box.

Training Notes: gives a short description of the training mode.

Current Image or Database radio buttons

This allows the display of either the path of the current image or the database.

Next Image button

Moves to the next image in the Database.

KEY label

This displays the KEY of the image currently being shown.

Block Zoom Checkbox

This selects the zoom type. If the check box is "not-checked" the zooming is somewhat "smoothed" at high resolution. The default mode is "Block Zoom" which is NOT smoothed.

RST Button and adjoining text box

This is a restart button to resume classifications at some arbitrary point. The adjoining text box is used to specify which point to resume.

Zoom Field

This selects the zoom factor to be used during classification. Also note that zooming can also be done by right clicking in the area to be zoomed while the entire image is displayed. Also note that the zoom can be increased/decreased by using the up/down arrow keys. While viewing a zoomed image during classification, each time the arrow key is depressed, the zoom changes by 2.

Point Field

This indicates the number of the point on the grid currently being classified.

Begin Button

This button starts the classification sequence though the grid. It causes the image to zoom to the first grid point for classification. Each classification causes the screen to move to the next classification point.

Rotate Button

This button rotates the image 90 degrees.

>> Contrast

This button increases the contrast.

<< Contrast

This button decreases the contrast.

Darken Button

This button darkens the current image. It is NOT saved to disk!

Lighten Button

This button lightens the current image. It is NOT saved to disk!

R Button

This button restores the original image from the disk.

Classify Radio Button Train Radio Button

These radio buttons allow one to select between the classify mode (default case prior to version 1.45) and the training mode. The Training radio button is to allow a new SamplePoint user to compare their classifcations with those of an 'expert'. While in this mode, the trainees classifcation is NOT written to the database. It is compared with the 'expert' result and provides feedback to the trainee when the answer is incorrect. At the end of the grid points for the image, statistics displayed on the screen.

>> Cont

This button increases the contrast of the image.

<<Cont

This button decreases the contrast of the image.

Refresh Button

This button refreshes the image with the current zoom factor. In the event that the zoom factor has been modified, it will use it.

DEFAULT CLASSIFICATION BUTTONS ARE:

(Custom Buttons can be anything.)

<u>Grass</u> Button

<u>Forb</u> Button

<u>Shrub</u> Button

<u>Cactus</u> Button

<u>Litter</u> Button

<u>Soil</u> Button

<u>Rock</u> Button

<u>Unknow</u> Button

Each time one of these buttons is clicked, the corresponding classification is entered into the database for that point. The image is automatically advanced to the next grid point.

<u>Back</u> Button

This button is used to back up 1 grid point. It is then possible to reclassify that grid point.

<u>Exit</u> button

As expected, this exits the application.

<u>Comment</u> button

This button is used to enter a comment into the comment field.

Description of the SamplePoint Program

The SamplePoint program was written to be used for the classification of vegetation based on a digital image.

SamplePoint is written in C# which is currently the newest programming language from Microsoft® Corporation in its Visual Studio.NET suite. C# is an object oriented language with significant graphics support. The programming paradigm for creating windows programs (forms/screens) is the very best and easiest to use that the author has ever seen. It allows powerful easy rapid prototyping to be done.

A database provides for the user to input what series of images are to be classified. It also provides storage for the record of the values of the classifications. An Excel Spreadsheet was chosen as the database because most people are familiar with Excel and can more easily use it to input the required data fields and to manipulate the output data. The data collected can easily be copied to any other Excel Spreadsheet for further analysis or storage. The database contains input from the user of the name of each image. The program provides output to the database in terms of what was classified. Up to 225 classifications can be made on each image.

The program loads each image into a 'picturebox' which is a C# control. The image is 'resized' to fit in the picturebox. As the user selects a classification to make and clicks on the appropriate button, the classification is recorded. Along with the classification type, the RGB color values are stored in the same cell.

The program provides a variable number of 'zoom factors' as input in the field called "zoom". It is possible to zoom by right clicking or (once the classifications have begun) by changing the zoom factor in the field and clicking on "refresh" or by using the up/down arrow keys.

The menu item "create statistics file" will generate summaries of the data into comma delimited text files which can be used for further analysis.

NOTE: SamplePoint was intended for use with large images (e.g. say 2560x192). If used with very small images, you may get an error message and it will fail.

Excel Database Integrity Checks

Several checks are performed by the program to protect against user error in the Excel Database which might result in erroneous measurement data being inserted into the database. These checks should prevent that.   See the Help Page on Setting up the Excel Database.

1.   If the database does not conform to the instructions for setting up the Excel Database, the program shows a Message Box with the message
```
"This is a badly formed database!!!
 See the help for setting up the database"
```
If this occurs, FIX the Excel Database then proceed.

2.   When the Excel Database is first selected, the program insures that the KEY numbering is sequential. If not, the program shows a Message Box with the message:
```
 "Bad KEY sequence starting at KEY = "
```
This indicates that the user needs to renumber the KEY field in the database.

The program also indicates the number of images found which is shown in a Message Box. If this is less than you expected, then perhaps a KEY is missing in the Excel Database.

3.   When each image is loaded, it checks to make sure that the Database contains an image name in the field called "IMAGE". If not, the program shows the following message:
```
"Image is missing from KEY = "
```
The KEY is given, so it is easy to find and insert the filename of the

missing Image.

4.   If the image type is not of the allowable image types, the program gives:

`"Wrong image type or missing image from KEY = "`
`Allowed image types are bitmap, JPEG, TIF, GIF or PNG"`

If this occurs, then you need to use your "batch processing" feature of your image processing program to change to a JPEG or related type.

How to Setup Custom Buttons

In order to classify sample points by items other than the default buttons, it is possible to customize the buttons as follows:

MAKE THE CUSTOM BUTTON FILES (this can be done at any time.)

1.   Click on the Options || Custom Buttons || Create Custom Button Files menu item. This brings up the form called "Define Custom Buttons".

2.   Fill in the desired button names. These names will be used to label the buttons, used in the individual database cells, as well as for providing the header classification labels in the statistical report.

3.   If desired, you can add a detailed description of the meaning of the button. It is highly recommended that this be done for keeping clear the meanings.

4.   Note that a blank field will cause the button to be invisible. This is useful for eliminating unused buttons.

5.   When finished with making the labels, Save the Custom Button definition to a convenient location.

6.   You can make as many Custom Button definitions as desired. A Database MUST be loaded before Custom Buttons can be loaded. None are "LOADED" into the database for use until the following procedure.

USE A CUSTOM BUTTON FILE

1.   Load a Database, the custom button file can only be "applied" to a loaded database.

2.   A new menu item appears as: Options || Custom Buttons || Load Custom Button File.

3.   Click on the Load Custom Button File menu item to bring up a screen for loading the file as previously defined.

4.   Select the file and load it.

5.   This causes the following actions: a) button labels are defined as per the file. b) the internal classification types are correspondingly labeled. c) the definitions are stored internally to the database so they can automatically be applied when the database is loaded the next time.

NOTE: It is possible to "Edit" a Custom Button Set by loading it into the form and making the desired changes, then saving the new definition. You can also do this to add definitions to an existing button file.

NOTE: It is assumed that a particular database will have all of it's' images classified according to the same set of classifications. That is only a single Custom Button File will be used for classification purposes. If a mixed set is used, the statistical report will only report on the images classified with the button set last applied. The others will be reported as error.

It is recommended that all images in a database be classified according go the same button set.

How to Use SamplePoint

1. Set up the Excel Database (see the Help page on setting it up). Store the Database and the images in the same directory.

2. Start the SamplePoint Program.

3. Select the desired gridsize.

4. Select the Excel Database.

5. Select and load any Custom Button Files if desired.

6. Click on Begin. The program will move to the first classification gridpoint.

7. View the zoomed image and classify the center point as per one of the classification buttons. The image will move automatically to the next grid point. NOTE: You can either use the mouse to select a classification button or use the numeric keypad to select one of the first ten classification buttons. In this case, it is suggested that you use Custom Buttons that include the number of the button for ease of entry (e.g. Rock-1).

8. Continue doing step 6 until done with all grid points on this image, then select the next image.

9. Continue steps 6 and 7 until all images are classified.

10. Select "Create Statistics Files" to summarize the work done.

Performance Discussion

If You Are Having Performance Problems Consider

   1.   Processor speed may be a factor since the images may be resized when loading on the form. On a 2.0 GH class machine with images of about 3 MB, images load in about 2 seconds. The only suggestion is to stop any other applications that may be running.

   2.   Image size may be a factor; very large images will load slower.

   3.   If you have the directory containing the images and Excel database somewhere on your network, the speed will be affected greatly by the speed of your network. Optimal performance, of course, will be possible if you have all the files on your local disk.

   4.   Note that the use of the Block Zoom option will take longer to load images when zooming.

The program should be relatively insensitive to the number of images being measured.

Note that the default action is to automatically load the next image while the user is "working" on the current image. This greatly improves the perceived performance.

Database Wizard

To use the Database Wizard:

1. Click on the menu item to open the Database Wizard.
2. Name the Database in the textbox control.
3. Click on the button to Create/Populate the Database.
4. A control appears which can be used to select one or more image files to include in the database.
5. To select a sequence of files, select the first one in the list, then hold down the shift key and select the last one.
6. To select random files, hold down the Ctrl Key and select as many as desired.
7. When done, click on OPEN, the Database file will be created and populated in a couple of seconds.

Manually Setting Up the Excel Database

A simulated Excel Database for this program is show below, as an example:

	A	B	C	D	E	F		HU	HV	HW	HX	HY
1	KEY	IMAGE	COMMENT	GRIDSIZE	POINT1	POINT2	...	POINT225	Custom	BtnKey	BtnDef	DEF
2	1.00	Stream1.jpg		25	Grass, 34, 27, 21	Forb, 58, 50, 27	...		T	1	Rock	
3	2.00	Stream2.jpg		25	Shrub, 107, 93, 67	Cactus 167, 145, 168				2	Soil	
4										3	Roots	
...										...		
31										30		

Note: The database extends to include data for 225 Points

This Excel database contains data for two of the entries.

<u>KEY</u> is a field that must be numbered sequentially from 1 to the maximum number of images being measured. KEY is used as a database key to reference items in the database. The KEY values should be integers. This must be filled in by the user.

<u>IMAGE</u> is a field that contains the file name of the image to be measured. Allowable image types are bitmap, JPEG, GIF, TIF and PNG. Image names listed in the database, must include the file extension. This must be filled in by the user.

<u>GRIDSIZE</u> is a field that contains the grid size used for the classification. This is filled in by VegCount as the classification proceeds.

<u>COMMENT</u> is a field for user notes on each image.

<u>POINT1</u> to POINT225 contains the classifications and RGB values for each grid point done. . This is filled in by VegCount as the classification proceeds.

CUSTOM   is used internally to record if the Database has a custom button definition.

BtnKey .. is used internally to access up to 30 Custom Buttons.

BtnDef is used to record the definitions of the eight classification buttons.

DEF is used to record the detailed descriptions of the custom button.

NOTE: all the images AND the Excel database MUST be in the same directory.

Create the Database

1.   Open Excel and select columns D though HW are to be formatted as text. Format the GRIDSIZE and the KEY columns as a number.

2.   Select columns A through HW in order to name or define a range in the database. The following instructions are for Excel 2000, other versions may differ in the details. Use the Excel menu steps as INSERT|NAME|DEFINE. Enter the name DATA in the top textbox. The textbox at the bottom, called 'refers to', should contain =Sheet1!$A:$HY. Click on ADD. This names the entire set of columns A-HW as DATA which is where all the image information and classifications reside.

3.   Select the first row ONLY columns A and B in order to name a range in the database. Use the Excel menu steps as INSERT|NAME|DEFINE. Enter the name TEST in the top textbox. The textbox a the bottom called "refers to", should contain =Sheet1!$A$1:$B$1. . Click on ADD. This names the entire first row of A and B as TEST.

4.   As shown in the example above, enter KEY into A1, IMAGE into B1, GRIDSIZE into C1, POINT1 into D1… Do this for all the required fields. You should fill the spreadsheet through HW as illustrated above.

5.   Save the Excel database **in the same directory** with all the images.

6.   If you don't follow these instructions exactly, you will probably get an error that says "Badly formed database!" when you try to make measurements. The software makes a number of integrity checks to insure the database information is valid.

Two Alternatives to Creating the Database
Use the Database Wizard!
Copy the Sample database and use it!

Enter the Data
1.   Enter the Image names into each field called IMAGE. See the page on "Using the DOS Command Prompt to generate filename lists". In the cell next to each image, enter the appropriate scale factor, similar to shown above. See the help page on determining Image Resolution.

2.   Create a set of keys for the database in the field called KEY. Start with 1 and number them sequentially in increasing order.

Install the Excel Database
1.   Put the Excel database into the same directory with all the images.

Proceed to measure
1.   See the help page on How to Use the Image Measurement Program.

NOTE: A Sample database is included with the installation. As an alternative to the above, just make a copy of the sample and insert your own data.

Database Notes:
Note that when making classifications, the newly classified data is stored in the corresponding point for that image. If there is already data in that field it is overwritten with the new data.

So you need to manage your own data.

NOTE: Regarding Images

It has been assumed that the images are in "landscape mode", that is the image is, say 4064 pixels WIDE and 2704 pixels HIGH. If this is not the case, the images will be rotated automatically 90 degrees right. It is also assumed that the images are in the aspect ratio as per the first sentence. If not, the picturebox will be rescaled so that the entire picture is viewable. This will leave empty area in either the bottom or right side of the form.

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Using the DOS Command Prompt
to Generate Filename Lists

The DOS Command Prompt found at START|PROGRAMS|ACCESSORIES can create a list of image names for pasting into the database to save the time of manually typing in the filenames. In the DOS terminology, the following commands are helpful:

e:	sets the E: drive as the root
cd \	change directory to the root directory
cd directory	type this in prior to the name of a directory you want to go to.
dir	provides a raw listing of all files in the current directory
dir /b	provides a basic listing of all files in the current directory, filenames only
dir /b *.jpg	provides a basic listing of all jpg files in the current directory, filenames only. Any filename type can be listed in this way, such as *.tif, *.bmp.
Help dir	lists dir command options.
dir /b>text.txt	creates a text file listing the filenames of all files in the directory. This can be used in conjunction with the *.jpg command, for example, to create a text list of all the jpg files in a directory.

EXAMPLE:

You want to create a text filename list of three images located at E:\Images\Test_Folder\July\. Type the following (red) after the black DOS readouts (actions are described in green text):

C:\Documents and Settings\Administrator>e: *(changes to E drive)*

E:\>cd Images\Test_Folder\July *(goes to the correct directory)*

E:\Images\Test_Folder\July>dir /b *(lists file names only)*
july01.jpg
july02.jpg
july03.jpg

E:\Images\Test_Folder\July>dir /b *.jpg>julyimages.txt *(creates txt file)*

E:\Images\Test_Folder\July>dir /b *(checking for txt file creation)*
july01.jpg
july02.jpg
july03.jpg
julyimages.txt *(new text file is present))*

There are two ways to finish: (either will work)
1.   Open Microsoft Excel. Click FILE|OPEN and select "Text Files" in the "Files of Type:" pull-down menu. Open julyimages.txt. The Text Import Wizard will open. If you created a basic listing as shown in the example, click FINISH right away since there is no need to specify delimitation for a single column of information. If the text file was made of a raw listing (no /b in the command line), then you will have to go through the Text Import Wizard's three steps and specify SPACE as the delimiter. Once the file is open, copy and paste the filename column into the ImageMeasurement IMAGE column.

2.   On the DOS command line type "notepad julyimages.txt". This opens up the new file into a window. Type a "Ctrl A" which selects all the images in the list, then type a "Ctrl C" to copy this to the clipboard. Open the Excel Spreadsheet, position the cursor to the first location for images, and type "Ctrl V". This pastes the result into the image column.

SamplePoint Files

SamplePoint includes the following Files

All files in this table must be in the same directory!

SamplePoint.exe	This is the C# executable file.
SamplePointHelp.pdf	SamplePoint Help file in Adobe Acrobat PDF Format.
SPDB.xls	The Generic Database used by the Database Wizard to create custom databases for your project.
SamplePoint.ini	This file will be created automatically when needed.
SPTracker.exe	This is the C# executable file.

All files in this table can be located anywhere and are named by the user!

Button.Btn	**This file is NOT required and may be located anywhere. All files with the suffix Btn are treated as Custom button definition files.**
ImageDB.xls	**This is an Excel file used as the image database. It is specially formatted to work with SamplePoint. It may be created manually or created with the Database Wizard.**

SamplePoint Change Log

Version 1.24 Dated August 9, 2005
1. Sorts alphabetically
2. More elegant method for inserting the data into the Database
3. Updated version number to 1.24 dated August 9, 2005
4. No SamplePoint Limit on the number of files that can be used.
5. SPDB.xls updated for the changes
6. SamplePointHelp removes the reference to a 250 file limit.

Version 1.27 Dated February 28, 2006
1. Spelling correction of UNKOWN to UNKNOWN.
2. Color Change, the "goto image" form was recolored to look like everything else.
3. Statistics were cleaned up, so extraneous 0's do not show up.
4. Help file is updated for all recent changes.
5. "Fixed" the problem with changing grid lines. I didn't reload the image to reflect only the new grid, what I did was delay stamping the crossbars until the start button is clicked. So you can change grids all you like until you start.
6. Added a menu item for creating random assignments of points. The program picks how ever many points that you specify. It picks each x, y value at random. It does add a guard value so the selection is at least 30 pixels from any border, just so it will zoom better.
7. The "about" form was updated to new issue and date. It also shows which version of .NET FrameWork is being used.
8. The grid button was made invisible.
9. The Custom Button form added a button to load existing button files so you can edit them. They can either be saved as the original button file or saved as something else.

Version 1.28 Dated May 10, 2006
1. File name is truncated to fit in the text box. If truncated, it might look like ...whatever fits.jpg
2. Whilst loading the Custom Buttons, the cursor changes to the system defined wait icon.
3. You can now use the mouse wheel to zoom.
4. About now says issue 1.28 on May 10, 2006.

Version 1.29 Dated June 27, 2006
1. Checks for boundary limits when coloring the next grid point.
2. Fixed the Random grid option.
3. Updated the version to 1.29 with a date of 6/27/2006.
4. Use of the color TEAL for inactive grid points and RED for the active point.

Version 1.30 Dated October 6, 2006
1. SamplePoint now Auto Rescales to allow new screen resolutions.

Version 1.31 Dated November 8, 2006
1. Added automatic retry if a database operation fails (e.g. Excel is running its timed AutoSave). It tries for a total of 3 times with a 300 ms delay between tries 1, 2, and 3. If it still fails, it gives the same error message modified as "3 Tries: EXIT, RESTART, THEN REDO THIS DATA POINT!.". plus whatever was there before.

Version 1.32 Dated November 14, 2006
1. Updated to Issue 1.32, Dated 11.14.06
2. Changed the retries to 5 on database error (this will give a little more margin; it will never take any more time than it needs.)
3. You can now select the first 10 buttons using either the mouse or the keypad. If a button is not defined, it is not visible (as before) and it is also not accessible from the keypad.

Version 1.33 Dated November 20, 2006
1. Updated to Issue 1.33 Dated November 20, 2006
2. Fixed minor problem with the database error retry so it counts properly.
3. Fixed problem where the RST function would erroneously select the keypad associated with the "number of the point to go back to" and record it in the current point.
4. Fixed the same problem with the Zoom textbox.
5. Changed the anchor property so the left side buttons and boxes stay near the bottom when using a higher resolution.
6. Changed btn9 to be the Default button called "Invasiv" to stand for "Invasive" so it fits on the button.
7. Changed the "Unknown" button to "Unknow" so it fits on the button.
8. Removed the % sign in the data created by the menu item Statistics.

Version 1.34 Dated April 6, 2007
1. Updated to Issue 1.34
2. Changed the inactive cross point color from teal to yellow for better visibility.

Version 1.35 Dated August 10, 2007
1. Changed the form load to "normal" rather than "maximized" which then fixes a oversized form problem with selected laptop computers.

Version 1.36 Dated August 30, 2007
1. Added error message when attempting to load custom buttons without loading a database first.

Version 1.37 Dated October 1, 2007
1. Made the Custom button definition fields smaller so they allow the same number of characters as the buttons that they display on.
2. Moved the "Begin" button up next to the "Next Image" button for ease of use.
3. Moved the "Refresh" button to where the "Begin" button was located.
4. Added the ability to lighten/darken an image. The modified image IS NOT WRITTEN to DISK. Note the Lighten, darken, and R (Restore) buttons.
5. Fixed the "Exit" button so it would show up when the screen was in a reduced mode. It was hidden while on the PictureBox.

6.   Fixed the "Back" button so it does not generate an error when it is clicked and the classification is on the first point.
7.   Added a "SnapZoom" feature, which when enabled causes the image to be zoomed to a predefined level when going to a new classification point.
8.   Added a file called "SamplePoint.ini" which remembers the state of the "SnapZoom" option.

Version 1.38 Dated October 26, 2007
1.   Added the "Rotate" button, which rotates the image 90 degrees with each click. Rotation MUST be done before adjusting the image with the brightness and contrast buttons.
2.   Added the ">> Contrast" and "<< Contrast" buttons to adjust the contrast.
3.   Requires the use of the 2.0 .NET Framework.

Version 1.39 Dated November 6, 2007
1.   Added a second PictureBox for use by dual monitors. The form can then be stretched over the second monitor and the second image can differ from the first by the zoom level.
2.   Added a textbox for user comments on each image.

Version 1.40 Dated November 12, 2007
1.   Added the SamplePoint Tracker program which launches as a second process. SamplePoint sends messages to SPTracker so it can display the same images as SP with it's own zoom level relative to SP. It uses networking to send messages, so it will be necessary to enable the firewall to let the program have network access.

Version 1.41 Dated November 21, 2007
1.   Moved the Back button and the Exit button so they are accessible on smaller screen resolutions.
2.   The comment field was added to the text file created for summarizing the statistics.
3.   Minor change was made to the statistics creation, which speeds up the calculations in certain cases. The algorithm now will stop processing on each row when the first blank cell is encountered. Previously, it continued looping for the count "gridSize" even when the cells contained no data.
4.   Block Zoom was added to SPTracker.
5.   A rotation problem was fixed in SPTracker. In one case, it rotated the wrong direction.
6.   A version number was added to the label in SPTracker.

Version 1.42 Dated December 3, 2007
1. Wait cursors were added to several of the time consuming operations for better human factors.
2. Code was added to take advantage of dual processors. If a machine has 2 or more processors, most time consuming operations that run on SamplePoint and SPTracker can be run in parallel, rather than serially as previously.
3. It is now possible to reopen SPTracker if it were closed prematurely. Only a single SPTracker can be executing on a given PC, so if a second copy is attempted to run, the first copy will be terminated.
4. Fixed problem where the second image in "dual monitor" mode would not respond to "Lighten" or "Darken".

Version 1.43 Dated January 24, 2008
1. Changed the message sending in SamplePoint, so that it is NOT broadcast onto the network, only to the local processor. With the previous version, multiple users on the same network could interfere with one another.
2. Updated version to 1.43.

Version 1.44 Dated May 5, 2008
1. Updated version to 1.44.
2. Added detailed error diagnostics to almost all error messages.
3. Fixed crash that occurred when the selected database was empty.
4. Added a link on the TOC page which directs the user to the Tutorial web page.
5. The MessageBox shown when a database is loaded was simplified.
6. The Point Field on the bottom left of the form was changed so it is not editable.
7. The grid for random points was corrected so it now works properly.

Version 1.45 Dated October 23, 2008
1. Updated version to 1.45.
2. Added an error message whenever someone attempts to overwrite existing data in the database.
3. Added radio buttons to select either "Classify Mode" or "Training Mode".
4. Added a help menu item for the "Training Mode".

5. Added Training Mode for trainees to learn from 'experts'. See the help menu.
6. Changed the statistics menu item to save files as csv rather than text.
7. Added statistics for the trainee to see how well they performed.
8. Added fields to the Custom Button form to allow users to add a description of the meaning of the classification button.
9. Added a menu item to allow the descriptions to be read.

Version 1.46 Dated January 1, 2009
1. Updated to version 1.46.
2. Changed to store the following variables ROTATE, WIDTH and HEIGHT which are used to replicate the 'experts' environment during training.
3. Added the ability to establish the same environment as used by the 'expert' when doing training.
4. Fixed minor problem where the txtError textbox and "Save Results" button could be inadvertently left on the screen.
5. These repairs allow the 'expert' to select a grid size on his/her PC and create a training file which can then be effectively used on a PC with a different screen size.
6. NOTE: The 'expert' database MUST use version 1.46 or later to create the file to be used for training.
7. Added the ability to change the ACTIVECOLOR of the crosshair.

Version 1.47 Dated March 5, 2009
1. Updated to version 1.47.
2. Added the ability to check the website to read the latest version number and alert the user that a new version is available. This is done automatically when the form is opened.
3. Added a menu item to manually check the website for updates and open the browser to the download page, if a newer version is available. The default browser is used and in the case of an error in loading the default browser, the IExplorer is used.
4. The menu item to download the Acrobat reader was changed to use the default browser.
5. Option radio buttons were added to allow viewing either the Current Image name or the Database name.
6. A message was added to the completion of the Database Wizard to indicate that the database was successfully created and gives the file location of the database.
7. Fields were added to the Custom Button form to allow the user selection of

"Short Cut" keys, a single alphabetic character associated with each button.

8. The SDB database was modified to allow storage of the Short Cut keys.

9. The form for displaying the button descriptions was modified to include the Short Cut keys.

Version 1.48 Dated September 10, 2009

1. Updated to version 1.48.

2. The comment label was changed to a button which brings up a new form which is used to enter a comment. This was necessary since a "short Cut" key when entered into a comment field was also taken as a button click on a grid point.

3. The comment field was changed to read only as per above.

Version 1.49 Dated December 15, 2009

1. Updated to version 1.49

2. The use of Y, y, N, or N was disallowed as a "short Cut" key since it interfered with the keyboard keys to select Yes or No on dialog boxes. These characters are now also blocked when detected in existing database "short Cut" definitions.

3. The comment on the Database Wizard form was revised to state that if an error occurs when selecting files to create the database, then reduce the number of files to less than 200. Note that 200 is not necessarily a hard limit.

Version 1.50 Dated February 17, 2010

1. Updated to version 1.50, updated SPTracker to version 1.50.

2. A new faster algorithm was designed to significantly speedup the BlockZoom function. It was also split to run on four threads, so that it could be run concurrently on as many as four processors.

3. The new algorithm and multi-core code was installed in SPTracker.

Version 1.51 Dated December 14, 2010

1. Updated to version 1.51, updated SPTracker to version 1.51.

2. Windows 7 provides a rapid refresh of screen images which interferes with the multi-core BlockZoom function. A minor change was made to stop this interference both in SamplePoint and in SPTracker.

Version 1.52 Dated July 1, 2011

1. Recomplied to run as 32 bit only to be compatible with 32 bit database drivers. This now works on 32 bit and 64 bit operating systems.

Version 1.53 Dated October 11, 2011
1.   Modified so that null comments will not attempt to write into the database. This prevents database errors on some machines.
2.   Modified so it writes the original RGB values into the database, even after lightening or darkening.
3.   Fixed so correct RGB values are written when the point selection is random.
4.   Modified to invoke memory cleanup frequently when darkening or lightening so as not to run out of memory when using very large images (e.g. 48M).

Version 1.54 Dated February 1, 2012
1.   Changed Web address for updates to http://SamplePoint.org.
2.   Minor changes to the "about" box.
3.   SamplePointTracker was recompiled to run as 32 bit only. This works on both 32 bit and 64 bit operating systems.
4.   When loading the Help file contents, it now uses the user defined option (e.g. Adobe Reader) instead of Internet Explorer.

Version 1.55 Dated September 18, 2012
1.   Fix for Random grid selection.
2.   Additional grid sizes were added.

Troubleshooting of Common Problems:

As with any software, closing the program and reopening solves 99% of all problems.

1. Database cannot be created using the database wizard.

>> This can result from security measures imposed by your IT Administrator. If your user login does not have certain permissions, you will not be able to ask SamplePoint to create an Excel file.
>> Try creating a database under the My Documents folder, and not in the Program Files folder.

>> Be sure you have .NET 2.0 or later installed on your machine. If you engage in regular online Microsoft Windows updates, you should have the latest version installed.

>> You must have Microsoft Excel or OpenOffice.org Calc installed on your PC
.
>> Images must be located on a writable disk, not a CD or DVD.

2. Crosshairs are too small or too large.

>> Crosshairs in the SamplePoint window are always 41 pixels wide and tall, so the appearance of small or large is a product of the relative size to the

image being analyzed. A low resolution image (1 mega pixel) will show the crosshairs very large even at zoom 1, while a high resolution image (11 mega pixel) will show the crosshairs very small at zoom 1. If this is a big problem, and you cannot see the crosshairs well enough, try reducing the resolution of your image using Photoshop. There is no remedy if the crosshairs are too large…take higher resolution images next time.

3. Error message: Wrong image type.

>> Be sure your database is located in the same folder as the images. Images must be on a writable drive (not a CD or DVD).

4. Images do not show up in the folder when creating database.

>> If your images have four-letter extensions, like JPEG or TIFF, just select "Files of Type: All Files" in the file select box. These extensions will work fine in SamplePoint.

5. Error message: Data error in update

>>This is a rare error that is suspected to have one of two possible causes: Either the machine is lacking in RAM and cannot process the information to the database fast enough, or the auto-save function in Excel has kicked on while SamplePoint is attempting to write data to the database. Version 1.32 attempts to fix this issue by allowing SamplePoint to attempt up to 5 database writes should the first one fail. If you receive this error, please contact r.berryman@comast.net with details on the error as we are still attempting to safeguard against it.

6. Program slows considerably as more and more images are classified
.
>> Since SamplePoint opens the Excel database every time a point is classified in order to write the data, larger databases require more time to open, save and close. Thus, as the database continues to grow in file size, response time through SamplePoint will suffer. The degree to which this sluggishness occurs will vary and depend on the computer being used. Users with blazing-speed computers may not notice any response difference at all, but users with machines that have less than 1GB RAM will likely see this. Solution: Instead of creating a giant database with 200 images called IMAGES, try splitting the image set into 4 databases with 50 images each and call them IMAGES-A, IMAGES-B, IMAGES-C, IMAGES-D

>> Also note that the use of the Block Zoom option will take longer to load the image when zooming.

7.   Error message of the type:
"5 Trys: EXIT, RESTART, THEN REDO THIS DATA POINT!
 Data Error in UpDate = UPDATE DATA SET Comment = "" WHERE KEY = '42'"……

This can be caused by using an old Excel database format. If the "Comment" field is missing, insert it in the DataBase in Column D.

This can also be caused by having the Excel Database open while running SamplePoint, if so, close it.

It cab also be caused momentarily by having the Excel Autosave function enabled, turn it off.