# **True Life Anatomy**

**TLA Viewer User Manual** 

Version 1.3

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### Introduction

#### Welcome to TLA Viewer

Welcome to the TLA Viewer, the world class 3 Dimensional Medical imaging visualization software from True Life Anatomy. TLA Viewer brings 3D visualization of Scan data derived from CT and MRI scanners to your PC desktop system.

The TLA Viewer Software reads TLA Files generated from TLA Generator which contains both the 3D model as well as the CT slice data in a compressed form. This 3D image data can also be transmitted by network or broadband connection.

True Life Anatomy, has created a product that can help Radiologists, Doctors, Researchers, Medical Educators and Training Institutions to quickly and easily view 3D Models and 2D CT and MRI slice images. The aim has been to develop a system that is easy to use and offers more functionality and interactivity for education, training and diagnosis within the 3D medical imaging arena.

This User reference contains detailed information about all the features and capabilities of TLA Viewer. This manual should be used in conjunction with the PowerPoint™ and other demonstration as supplied with your installed version of TLA Viewer, plus on line examples at <a href="http://www.rubamas.com/case-studies.htm">http://www.rubamas.com/case-studies.htm</a> and forum discussions.

There are extensive and detailed discussions, demonstrations and other information at <a href="https://www.truelifeanatomy.com">https://www.truelifeanatomy.com</a>

Log corrections to this document at http://mantis.truelifeanatomy.com

Thank you for selecting True Life Anatomy software for your anatomical imaging solutions.

TLA GENERATOR DOES NOT HAVE FDA, CE OR TGA CERTIFICATION, AND SHOULD NOT BE USED FOR PATIENT CARE OR PRIMARY DIAGNOSIS.

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### **True Life Anatomy Documentation Overview**

In addition to this user guide, more up to date information is available on line at <a href="https://www.truelifeanatomy.com">https://www.truelifeanatomy.com</a> covering:

- TLA Viewer Installation Guide Contains complete installation.
- TLA Viewer User Reference Contains complete reference material describing the features
  - of TLA Viewer, as well as many step-by-step procedures. Also covers fundamental concepts and strategies for using the product. Access the reference online by choosing Help > Contents.
- TLA Viewer ReadMe file Contains general information, System Requirements and the product's known problems and limitations.

#### **DICOM Series**

When a CT Scan is performed, the data that is created is known as a DICOM Series. A DICOM Series represents a number of sequential slices or 2D images that are created as the scan up moves along a surface projecting rays of infrared lights through the area being scanned. A collection of 2D images or slices that relate to each other are grouped as a DICOM Series.

The DICOM files or 2D images are saved and consist of a range of greyscale information that when interpreted correctly and in sequence, can be used to construct a 3 Dimensional model of the scanned area. The TLA Generator uses DICOM series to create 3Dimensional models as well as extracting other information from the series such as Patient Details, Scannner manufacturer details and Session information.

#### **TLA file**

A TLA File can only be created when generated through the TLA Generator software. The file includes 2D CT image data that is compressed for reasons of maintaining a smaller file size as well as 3D Model data that represents the sequence of 2D CT images as a 3Dimensional model.

TLA files can only be viewed with the appropriate readers namely the TLA Viewer, TLA Generator and TLA Animator products. Whilst TLA files can be interacted with it is only the TLA Generator that allows you to manipulate and change the file but means of manipulating 3D models, adding reporting information or creating additional 3D models.

### **About True Life Anatomy Medical Imaging Tools**

True Life Anatomy, an IT development company in Adelaide, Australia, has been working on software programs that can create a 3D model of bones and other anatomical structures from plain CT scan slice data and saved in such a way that it can be exported and easily viewed on a standard computer.

While there are a number of other programs that are utilized by Radiologists to create 3D images for their diagnostic work, the information and images for the requesting Clinician are generally provided only as 2D representations of the 3D model. This is done as screen image captures in the form of a series of representative views or possibly as a movie, which gives the impression of 3D interaction but in reality is not. They are generally unable to save the data as a 3D model and provide it for the requesting Clinician to view and interact with in real time.

The unique feature of the True Life Anatomy software is that the scan data can be converted into a 3D model (using TLA Generator) and that model can be provided to the clinician as a true 3D model that can be viewed, manipulated and modified in a PC environment using a "cut down" version of the program (TLA Viewer).

True Life Anatomy currently has the following range of products to provide true 3D access of scan data for the Clinician:

**TLA Generator** – The TLA Generator Software imports CT or MRI scanned two Dimensional slice data and creates the 3D model which is saved as a .tla file which contains both the 3D model created by the TLA Generator software as well as the CT slice data in a compressed form. The 3D Model can also be sent to the Clinician for viewing on another TLA program – TLA Viewer that requires less computing power. This 3D image data can also be transmitted by network or broadband connection.

**TLA Viewer** – The TLA Viewer allows viewing of TLA files created by TLA Generator software. This program requires less hardware resources and is much less complicated than the TLA Generator. It is designed for the clinician to view and demonstrate the TLA 3D images in the clinical, teaching and research setting. The user interface is simple and does not demand significant computer skills.

**TLA Animator** – The TLA Animator software creates animation files by reading in .tla files and creating "movie" frames based on the transformation or manipulation of these files over time. The created animation files are saved as native .tlm files or standard .avi files which can be distributed and viewed by either TLA Animator software or media players such as Windows Media Player.

**TLA VPOPS** – Virtual Pre-Operative Procedure Simulation or TLA VPOPS software is used to do virtual surgery and diagnosis. TLA files are used in conjunction with certain toolsets to provide physical rules and other diagnostic tests for virtual surgery simulation and diagnosis.

**TLA Analyzer** – The TLA Analyzer software is used to determine the relationship between individual objects and the rules that govern these relationships.

### **Patient Image Creation**

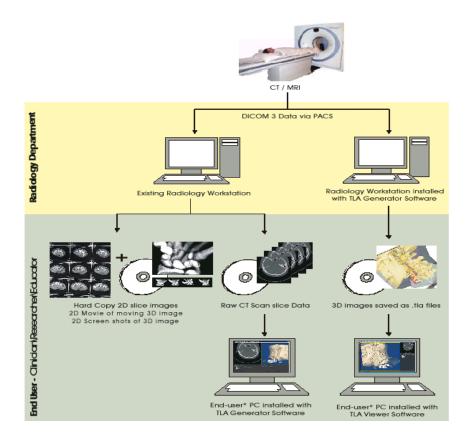
Current Radiological practice is generally that the images from a Patient's CT or MRI scan are provided for the ordering Clinician as 2D slices as well as snapshots of a possible 3D image reformation in digital or hard copy form.

Using the power of TLA Technology, as well as the usual hard copy films of the representative slices, this scan data can now be provided to the Clinician as a truly interactive 3D image. Using the TLA Generator Software on a networked CT or MRI workstation, the Radiology Service Provider creates the 3D image file from the imported Scan data and transmits them to the Clinician on CD or by network or broadband connection. The Radiologist could supply, or the Clinician may already have the TLA Viewer software on their computer to allow real time viewing and manipulation of the 3D model.

The viewing interaction in 3D allows the clinician to better understand the anatomical relationships of the affected area, plan the appropriate intervention and demonstrate to the patient in a dynamic and clear fashion the proposed intervention or pathology.

It is envisaged that the TLA Viewer software will become widely available as increasing numbers of Radiologists recognise that provision of a 3D model of the scanned area is of benefit to the clinician for diagnostic, therapeutic and patient educational purposes.

Further technological developments will allow Arthroplasty Templating in 3D as well as virtual pre-surgical simulation.



### **System Requirements and Recommendations**

S.No	Item	Minimum Requirements and Recommendations
1.	Supported Operating Systems	<ul> <li>Windows 2000 Professional Service Pack 1 or 2</li> <li>Windows NT 4.0 Workstation Service Pack 6a</li> <li>Windows 98 Second Edition</li> <li>Windows ME</li> <li>Windows XP Professional</li> <li>Windows 10+</li> </ul>
		The TLA products will run in a MAC (Apple Macintosh) environment by using programs such as <a href="Parallels@Desktop">Parallels@Desktop</a> <a href="Parallels@Desktop">17 for Mac</a> and separate Window OS. See help files on line sites or in product folder for details.
2.	Hardware Recommendations	<ul> <li>P4 2.2 GHz or higher</li> <li>1 GB RAM or higher, more memory generally improves responsiveness</li> <li>128 MB graphics card with open GL support</li> <li>3 GB or more free disk space on a single drive to accommodate the software and data.</li> </ul>
3.	Disk Space to Install (all software components)	TLA Generator – 50 MB Optional Software – 20 MB All TLA application plus storage of files > 500MB
4.	Web Browsers on Windows	<ul> <li>Internet Explorer 5.01 Service Pack 2, 5.5 (no Service Pack), 5.5 Service Pack 1, or 6.0.</li> <li>Mozilla Firefox 100+</li> <li>Chrome 100+</li> </ul>
5.	TLA Documentation	Adobe Acrobat Reader 4.x or higher to read the user manuals and online PDF files.
6.	Language Support	This release supports only English. All displays, menus, controls, wizards, reports, and user documentation are in US English.

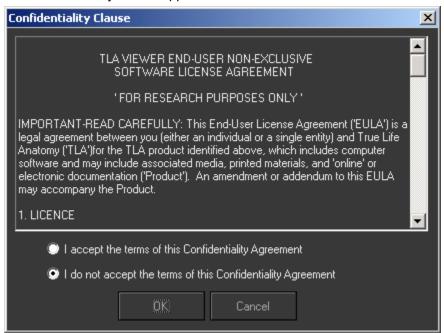
### Learning to use TLA Viewer

### Starting TLA Viewer

From the Start menu, select Programs → TLA → TLA Viewer → TLA Viewer -or-

Double-click the TLA Viewer icon on the desktop

2. The Confidentiality screen appears



Choose to accept or not accept the license agreement. If you do not accept the license agreement, exit the application by clicking Cancel.

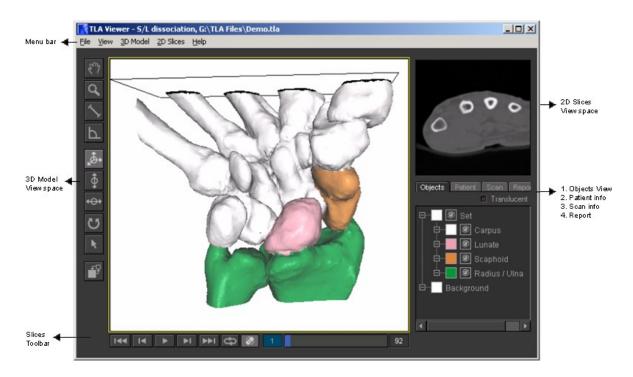
If you accept the license agreement, the application allows the user to continue to use the software.

Click the button OK to start using the application.

- 3. Click File → Open and choose a file, or
- 4. Click File → Open Recent to open a previous file.

#### The TLA Environment

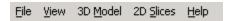
When you start TLA Viewer, the main window appears. It contains a Menu bar, Toolbars and different workspace like 3D View, 2D View, Preview function, Slices function, Model function, Objects view, Patient information, Scan information and Reports



On the top of the window are the menus. Different functions can be done using the menus or with the help of toolbars or context menus. Context menus are available by right mouse clicking anywhere within a workspace window such as the 2D slice view or 3D model view windows. The Menus, toolbars and context menus are organized by function.

#### The Main Menu

The main menu, near the top of the window, is called the "menu bar".



Each word or group of words on a menu provides access to another menu of related functions. When you click on a word on the menu bar, a drop-down list appears, showing the menu associated with that word. For example, when you click on File, the File menu is displayed:



When you click on an item listed in the menu, you either perform the task described by that item, or go to another screen to perform the task there.

### Menus Available from the Main Menu

The following menus are available from the main menu:

- File menu: contains functions related to opening, saving and closing TLA supported files, Exporting and printing, and application settings options. You also use this menu to exit TLA Viewer.
- View menu: contains functions related to pan, zoom, view and reset view.
- **3D Model menu:** contains functions related to tools that allow you to navigate and manipulate the 3 dimensional models.
- 2D Slices menus: contains functions related to tools that allow you to navigate and manipulate the 2 dimensional slices.
- Help menu: contains online help for TLA Viewer, including access to the tutorial and online website information. The "About" option on this menu is where your software version and contact details are displayed.

### The Toolbars

The toolbars gives quick access to various options and functions.

### 2D View toolbar

Button	Menu Access	Description	Shortcut
$\left[ \mathcal{E}_{\mathbf{u}} \lambda \right]$	View <del>→</del> Pan	Tool to move or drag the 2D image	Space bar
Q	View → Zoom In / Out	Tool to Magnify in or out the 2D image	Ctrl + + Ctrl + -
<b>\</b>	2D Slices → Measure Distance	Tool to measure the distance in millimeters between two points	D
P	2D Slices → Measure Angle	Tool to measure the angle in degrees	А
•	2D Slices → Contrast	Tool to manipulate the contrast of the 2D image	С
	2D Slices → Brightness	Tool to manipulate the brightness of the 2D image	В
	View → Swap 2D/3D	Tool to swap the 2D and 3D between the two view spaces	Ctrl + Tab

### 3D View toolbar

Button	Menu Access	Description	Shortcut
8m	View → Pan	Tool to move or drag the 3D model image	Space bar
Q	View → Zoom In / Out	Tool to magnify into or out of the 3D model image	Ctrl + + Ctrl + -
<b>\</b>	3D Model → Measure Distance	Tool to measure the distance in millimeters between two points that reside on the 3D surface or perpendicular to your 2D view. 2 values are given	D
Р	3D Model → Measure Angle	Tool to measure the angle in degrees on a 2D plane perpendicular to your view	А
<b>♣</b>	3D Model → Rotate Free	Tool to freely rotate the 3D Model	F
•	3D Model → Rotate X	Tool to rotate the 3D Model about the X-axis	X
↔	3D Model → Rotate Y	Tool to rotate the 3D Model about the Y-axis	Y

S	3D Model → Rotate Z	Tool to rotate the 3D Model about the Z-axis	Z
K	3D Model → Pick	Tool to pick an object in the 3D Model view workspace and make active to manipulate the same.	Р
	View → Swap 2D/3D	Tool to swap the 2D and 3D between the two view spaces	Ctrl + Tab

### Slices toolbar

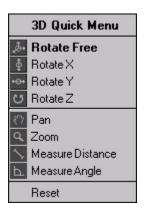
Button	Menu Access	Description	Shortcut
<b>I</b> ◀◀	2D Slices → Go to First Slice	Tool to go to the first slice image in the sequence.	Home
I <b>∢</b>	2D Slices → Previous slice	Tool to go to the previous slice image in the sequence.	Page Up
<b>&gt;</b> / <b>=</b>	2D Slices → Play / Stop	Tool to play the entire sequence of slice images sequentially. The button toggles from play to stop operations.	Enter
▶I	2D Slices → Next slice	Tool to go to the Next slice image in the sequence.	Page Down
▶▶1	2D Slices → Go to Last Slice	Tool to go to the last slice image in the sequence.	End
Ф, →	2D Slices → Loop	Tool to loop or play once the entire slice image sequence. The button toggles from play once to loop operations.	\
	2D Slices → Show / Hide 2D Plane	Tool to Display or Hide the 2D plane in the 3D Model view workspace corresponding to the 2D Slice image location within the sequence and on the 3d model.	Alt + P
89	2D Slices → Go to Slice Number	This is an editable field used to go to a 2d Slice image within the loaded sequence. Enter a valid sequence number and press enter to jump straight tho this 2d Slice image. If the 2d plane is active, the location will also update within the 3d model	1

view wo	rkspace to reflect the	
correspo	onding 2d slice	
location	on the 3d model.	

### **The Context Menus**

### 3D Quick Menu

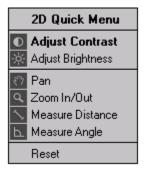
On right clicking the mouse on a 3D Model image, the user has the facility to call up the following tools and functions quickly.



Rotate Free	_	Tool to freely rotate the 3D Model
Rotate X	_	Tool to rotate the 3D Model about the X-axis
Rotate Y	_	Tool to rotate the 3D Model about the Y-axis
Rotate Z	_	Tool to rotate the 3D Model about the Z-axis
Pan	_	Tool to move or drag a 3D Model
Zoom	_	Tool to magnify in or out the 3D Model
Measure Distance	_	Tool to measure the distance between two points on the 3D Model
Measure Angle	_	Tool to measure the angle in degrees
Reset		Tool to reset the 3D model view workspace

### 2D Quick Menu

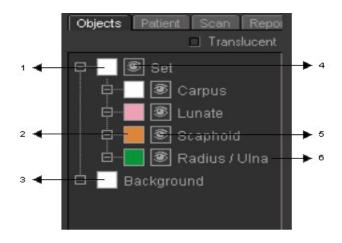
On right clicking the mouse on a 2D Slice image, the user has the facility to call up the following tools and functions quickly.



Adjust Contrast	_	Tool to manipulate the contrast of the 2D image
Measure Brightness	_	Tool to manipulate the brightness of the 2D image
Pan	_	Tool to move or drag a 2D image
Zoom	_	Tool to magnify in or out of the 2D image
Measure Distance	_	Tool to measure the distance between two points on the 2D image
Measure Angle	_	Tool to measure the angle in degrees
Reset	_	Tool to reset the 2D image workspace

### **TLA Object information**

### **Objects View**



### 1. Colour of total set of objects

Click this to apply the common colour to all the objects that make up the Set.

### 2. Colour of each object

Click this to apply the colour on the object in this row.

### 3. Background Colour

Click this to apply the colour to the background in the 3D model view workspace.

### 4. View all objects

Click this to enable / disable the view of all the objects.

### 5. View each object

Click this to enable / disable the view of the selected objects.

### 6. Object name

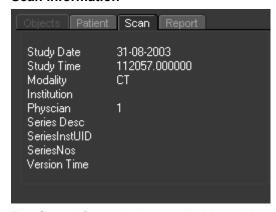
Click this to rename the object.

### **Patient information**



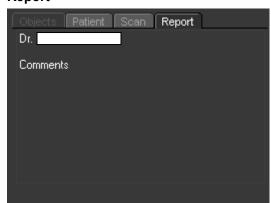
The patient information – Name, Id, Sex and the Date of Birth are un-editable and they are automatically derived from scan information created at the time the patient was scanned.

#### Scan Information



The Scan information is un-editable and is automatically derived from scan information created at the time the patient was scanned.

### Report



The Report information is un-editable in TLA Viewer and is created in TLA Generator at the time the model was created usually by the physician / radiology team who scanned the patient and reported on the images.

### **Exiting TLA Viewer**

- 1. To close the opened file, click File → Close.
- 2. To exit from the application, click File → Exit. If you made changes to the opened file and haven't saved them, you are prompted to save these changes.
- 3. Confirm whether you want to save these changes.

### Viewing and Navigating the 3D Model

The following tools enable the user to navigate through the 3D preview model.

Name	Toolbar	Menu Access	Description	Shortcut
Pan	8m7	View → Pan	Tool to move or drag the 3D model image	Space bar
Zoom	Q	View → Zoom In / Out	Tool to magnify into or out of the 3D model image	Ctrl + + Ctrl + -
Measure Distance	<b>\</b>	3D Model → Measure Distance	Tool to measure the distance in millimeters between two points that reside on the 3d surface or perpendicular to your 2d view. 2 values are given	D
Measure Angle	P	3D Model → Measure Angle	Tool to measure the angle in degrees on a 2d plane perpendicular to your view	A
Rotate free	<b>*</b>	3D Model → Rotate Free	Tool to freely rotate the 3D Model	F
X-Axis rotation	$\Phi$	3D Model → Rotate X	Tool to rotate the 3D Model about the X-axis	X
Y-Axis rotation	$\Rightarrow$	3D Model → Rotate Y	Tool to rotate the 3D Model about the Y-axis	Y
Z-Axis rotation	C	3D Model → Rotate Z	Tool to rotate the 3D Model about the Z-axis	Z
Pick	k	3D Model → Pick	Tool to pick an object in the 3D Model view workspace and make active to manipulate the same.	Р
Swap 2D/3D		View → Swap 2D/3D	Tool to swap the 2D and 3D between the two view spaces	Ctrl + Tab

### Manipulating the 2D Slice data

The following tools enable the user to navigate through the 2D Slices.

Name	Toolbar	Menu Access	Description	Shortcut
Pan	$\mathcal{E}_{\omega}$	View → Pan	Tool to move or drag the 2D image	Space bar
Zoom	Q	View → Zoom In / Out	Tool to Magnify in or out the 2D image	Ctrl + +
Measure Distance	<b>\</b>	2D Slices → Measure Distance	Tool to measure the distance in millimeters between two points	D
Measure Angle	Р	2D Slices → Measure Angle	Tool to measure the angle in degrees	А
Adjust Contrast		2D Slices → Contrast	Tool to manipulate the contrast of the 2D image	С
Adjust Brightness	- <u>`</u> ¢;-	2D Slices → Brightness	Tool to manipulate the brightness of the 2D image	В

### **Working with Frames**

Button	Menu Access	Description	Shortcut
144	2D Slices → Go to First Slice	Tool to go to the first slice image in the sequence.	Home
I◀	2D Slices → Previous slice	Tool to go to the previous slice image in the sequence.	Page Up
<b>&gt;</b> / <b>=</b>	2D Slices → Play / Stop	Tool to play the entire sequence of slice images sequentially. The button toggles from play to stop operations.	Enter
▶I	2D Slices → Next slice	Tool to go to the Next slice image in the sequence.	Page Down
▶▶1	2D Slices → Go to Last Slice	Tool to go to the last slice image in the sequence.	End
<b>†</b>	2D Slices → Loop	Tool to loop or play once the entire slice image sequence. The button toggles from play once to loop operations.	\
	2D Slices → Show / Hide 2D Plane	Tool to Display or Hide the 2D plane in the 3D Model view workspace corresponding to the 2D Slice image location within the sequence and on the 3D model.	Alt + P
89	2D Slices → Go to Slice Number	This is an editable field used to go to a 2D Slice image within the loaded sequence. Enter a valid sequence number and press enter to jump straight to this 2D Slice image. If the 2D plane is active, the location will also update within the 3D model view workspace to reflect the corresponding 2D slice location on the 3D model.	/

### **Exporting the TLA / DICOM file**

- 1. When the user is happy with the view of the 3D Model, set the 3D model as the active window and click File → Export as JPG.
- 2. Save the file in a specific directory / folders.
- 3. The 3D model as displayed in the window is saved as a jpeg format.
- 4. When the user is happy with the 2D slice image, set the 2D Slice image as the active window and click File → Export as JPG.
- 5. Save the file in a specific directory / folders.
- 6. The 2D slice image as displayed in the window is saved as a jpeg format.

Tip: 3D models and 2D images can be saved out as a snapshot window in JPG file format. This raster file or 2D image snapshot can then be used for input into your own report documents or other applications that support the JPG file format.

### Printing the TLA / DICOM file

- When the user is happy with the 3D Model, set the 3D model as the active window and click File → Print.
- 2. Ensure the printer is attached on the machine.
- 3. Click OK and the 3D model is printed as displayed in the window
- 4. When the user is happy with the 2D Slice image, set the 2D Slice image as the active window and click File → Print.
- 5. Ensure the printer is attached on the machine.
- 6. Click OK and the 2D Slice image is printed as displayed in the window

Tip: When printing either a 2D image workspace window or 3D model workspace window the relevant Patient Info, Scan Info, and Report info is also printed.

### **Service and Support**

**Contacting TLA Technical Support** 

http://www.truelifeanatomy.com

support@truelifeanatomy.com

### **Clinical issues**

Clinical@truelifeanatomy.com