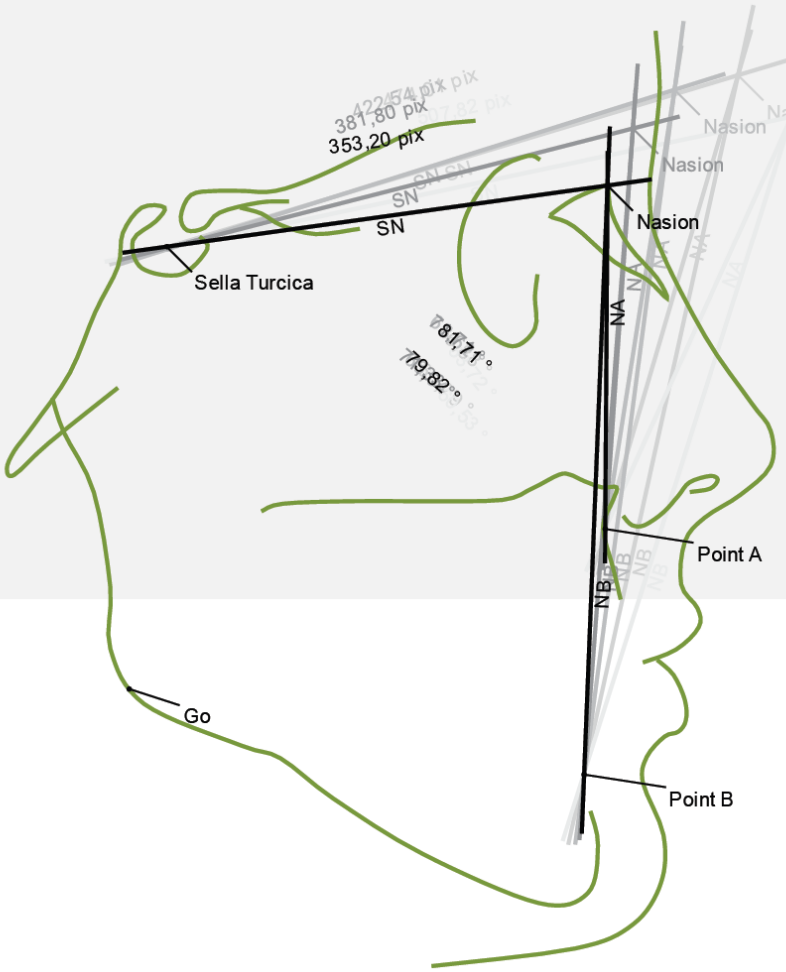


AUDAXCEPH®
CEPHALOMETRIC X-RAY ANALASYS SOFTWARE

Ver. 4 DEMO GUIDE

Table of Contents

UI OVERVIEW 5
ENTERING A NEW PATIENT 7
ENTERING DOCUMENTS 9
ANALYSIS 11
CALIBRATION 18
PRINTING 19
TECHNOLOGY 20
DOCUMENT FAMILY 23
SUPERIMPOSITION 25
ANALYSIS TYPE CREATION 33
DIGITAL FILTERS 48
NEW PATIENT FROM EXISTING ANALYSIS, MBOXES 51
ADDITIONAL TIPS – WIGGLE CHART 52
ADDITIONAL TIPS – STORING THE CALIBRATION 54
ADDITIONAL TIPS - CONVERGENCE POINT 56
ADDITIONAL TIPS - PARAMETERS 57
ADDITIONAL TIPS - EXCEL EXPORT 59
ADDITIONAL TIPS - ANALYSIS TYPE CREATION FROM PREDEFINED ELEMENTS 60
ORTHODONTIC IMAGES 61
ADDITIONAL TIPS – STRUCTURAL SUPERIMPOSITION 71
ADDITIONAL TIPS – VTO 75

Note: All red chapters in the table of contents are added in this version of the document compared to previous version. There are some minor changes in black ones as well.

Description

This demonstration is designed to help show the capabilities in AudaxCeph Cephalometric Analysis Software. We will cover the following sections:

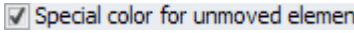
- Patient management
- Orthodontic images management
- Analysis execution
- Technology behind AudaxCeph
- Superimposition of analyses
- Superimposition of images
- Analysis type creation
- Digital filtering
- Tips and candies
- Snippet demos
  - Structural superimposition method
  - MBoxes
  - Wiggle chart
  - Automatic calibration
  - Software layout
  - Convergence point
  - Parameters
  - Excel export

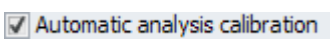
Setup Instructions

- Have AudaxCeph installed in `C:\AudaxCeph` folder. It could be another folder which will be referred as `home_folder`.
- Request demo files from Audax and put them into `home_folder\Analysis`.
    - Demo files are:

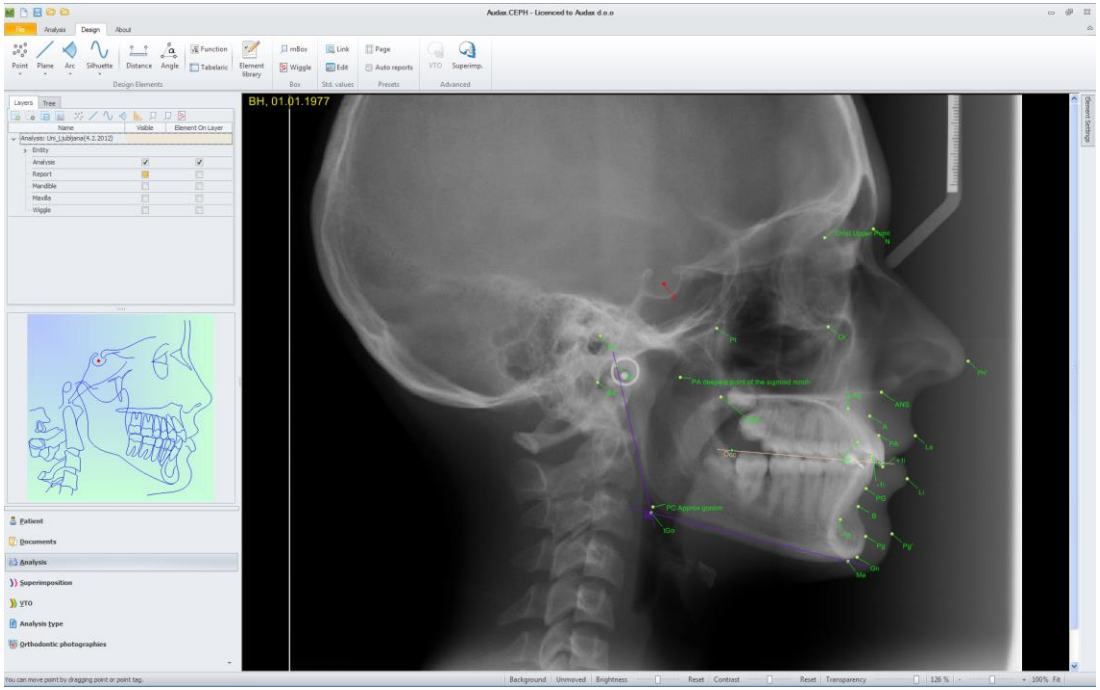
1.jpg	ExcelExportTemplate.xlt	SellaNasion.png
1st-stage.jpg	latXray.jpg	SellaTurcica.png
2.jpg	logo.png	SNA.png
2nd-stage.jpg	MK-latPhoto.jpg	SNB.png
ANB.png	MK_1.acx	standardValues-demo.xls
Barb_House_29_12_2015_	MK_2.acx	techAxCEPH.flv
A_1.acx	NA.png	Wits.png
demoAudaxCeph_1.acxT	NB.png	
demoDICOM.dcm	occlusalPlane.png	

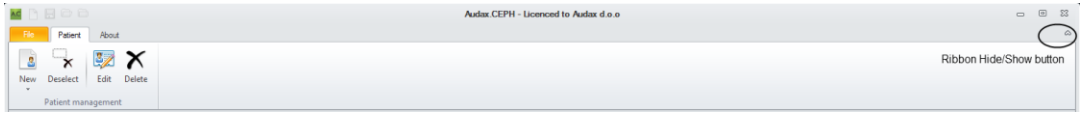
AudaxCeph

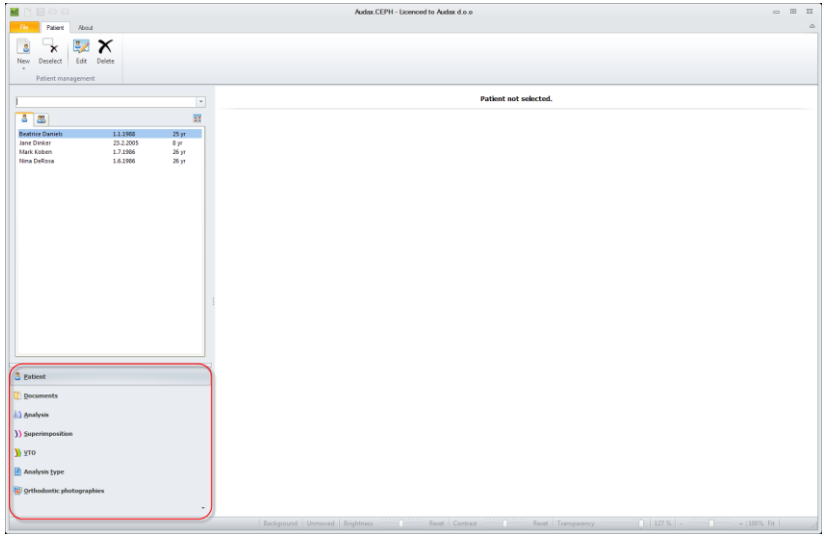
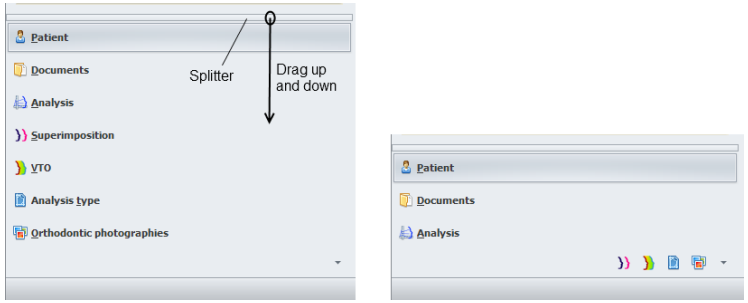
- Copy file demoAudaxCeph.acxT in `home_folder\AnalysisTypes`.
- Open AudaxCeph.
- Select **About tab → Language** and choose appropriate language for your demonstration. Press **OK**.
- In **Settings → Settings** check the Special color for unmoved elements (

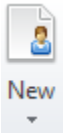
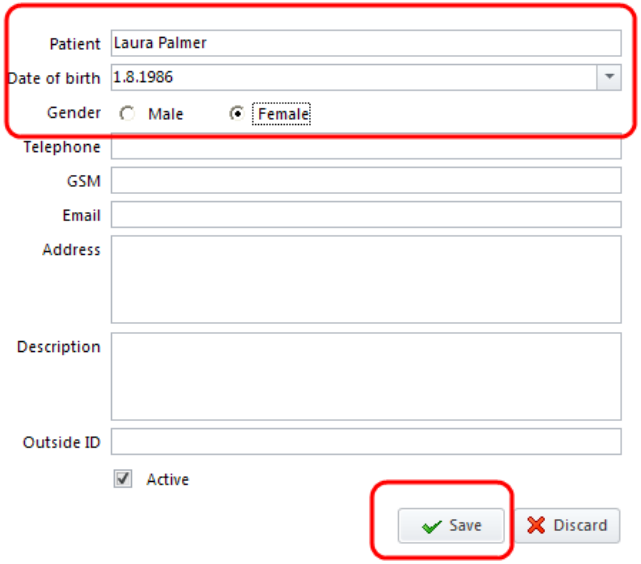
)
- In **Settings → Settings** check the Automatic analysis calibration (

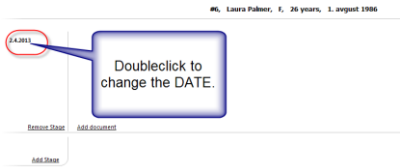
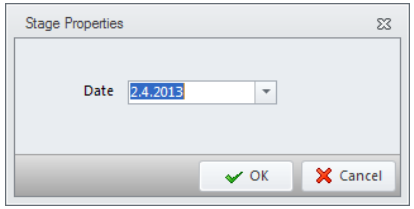
)
- In order to show Excel export/import functionalities, have MS Excel installed
- open MS Word with a blank document
- In analysis mode have Element settings dialog hidden (see image below)


Audax CEPH - Licenced to Audax d.o.o
Analysis
Design
About
Point
Plane
Arc
Silhouette
Distance
Angle
Function
Tabelaric
Element library
Design Elements
mBox
Wiggle
Box
Link
Edit
Std. values
Page
Auto reports
Presets
VTO
Superimp.
Advanced
Layers
Tree
Name
Visible
Element On Layer
Entity
Analysis
Report
Mandible
Maxilla
Wiggle
BH, 01.01.1977
Patient
Documents
Analysis
Superimposition
VTO
Analysis type
Orthodontic photographies
You can move point by dragging point or point tag.
Background
Unmoved
Brightness
Reset
Contrast
Reset
Transparency
126 %
100 % Fit

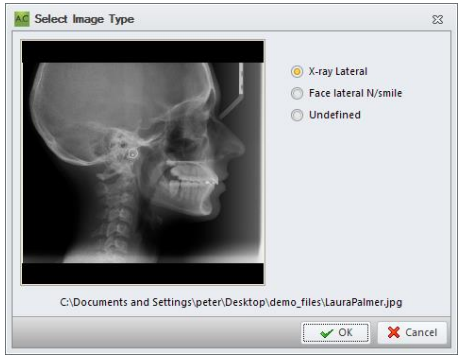
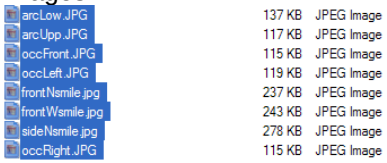
UI Overview			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Click on tabs to show how application have different commands	Hello and welcome to the Audax Ceph demonstration. We're going to start our demo with a user interface. On the top of the application is a ribbon. It acts like ribbons in other software. By choosing a tab, you may switch between different action groups.	
	Double-click on a ribbon tab so that ribbon hides. Double-click on a ribbon tab so that ribbon appears again. Repeat this using Ribbon Hide/Show button.	A double-click on a ribbon tab hides the ribbon with icons and another double-click brings it back again. We can use the Ribbon Hide/Show button for this purpose as well. This is an effective way to add additional vertical space to the application's canvas (working area) on a lower resolution monitors. 	
	Click on ribbon tabs **About**		
	Click **Language** and show the options. Click **OK**.	AudaxCeph speaks different languages. The demonstration you are about to see uses English version of language. But one can easily use other options and choose the desired language. The user interface language will change at the next restart of the application.	
	Click **Skin box** and chose some skins.	If you prefer another UI color scheme you may choose one from predefined skins. If you like blue, then choose blue. I find the grey skin very rich and nice. If you like fruits like an apple, you may choose McSkin.	

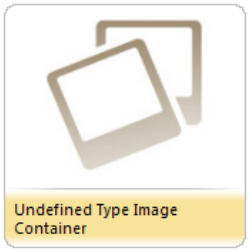
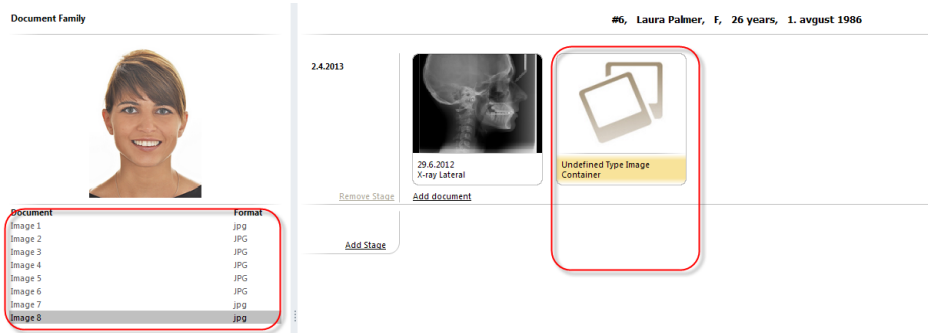
UI Overview			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Click different options from the Navigation bar	Now we will start with what every orthodontist does every day. Different applications can be chosen from the **Navigation bar** on left bottom where we can choose between managing Patients, Documents, creating Analyses, Analysis types,… 	
	Click between options on the Navigation bar.	Switching between options shown appropriate environment for a desired task. Navigation bar can be made smaller by dragging the upper splitter.	
	Drag the navigation bar splitter up and down		
	Leave it opened entirely up.	We will leave all option applications opened.	

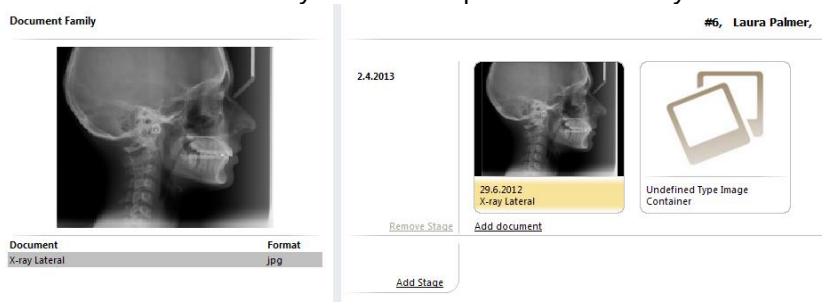
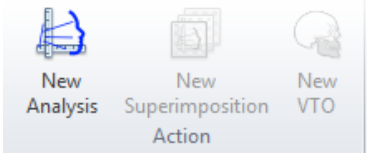
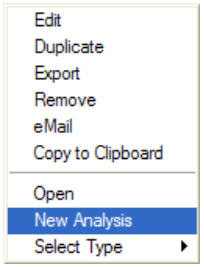
Entering a new patient			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Choose **Patient** from the **Navigation bar**. Click **New**  Enter Laura Palmer for patient, 1.8.1986 for Date of birth, Female gender. Active should have a Tick, which is there by default, when creating a new patient record . Press **Save** button.	A new patient record can be created by entering some personal data or from a Dicom file using the data inside it. Let us enter some data: Laura Palmer 1.8.1986 Female  And confirm the creation of the record. You may notice that computer calculates the age of the patient automatically. This can be useful when standard values are based on patient age and/or gender.	

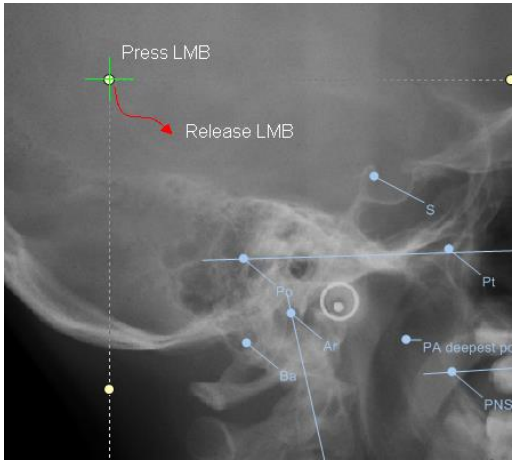
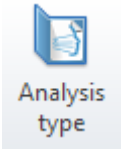
Entering a new patient			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
		We can notice that a new patient (Laura) together with her holder for documents of the first stage is created. 	
	Double click on the date of the stage. 	A double click on the date of the first stage pops a dialog for changing the date of the stage. 	
	Press Cancel in Stage properties dialog box.	We will leave it unchanged.	

Entering Documents

#	Picks	Technical Specialist Talk Track	Notes
	Open your demo files folder and and drag latXray.jpg on the first stage.	We are ready to enter some x-ray images and photography. We can use Add documents option on the stage or even drag and drop option. Whenever only one image is imported software suggests the type of the image. 	
	Press OK button.	At this stage it can be either x-ray lateral, lateral photography or other. The most frequent is chosen by default. When the conformation is done the image is put on the document holder and the image is recognized as X-ray lateral. Image is a copy and no change to the original has been done. Document navigation bar is selected and ribbon changes accordingly.	
	Open demo files folder and change it to ..\images. Select all images.  Drag-drop them to the document holder	We will add a bunch of images for Laura now. This are various photography stored on a file folder. When dropping them to the document holder a copy of each is made and stored in the system.	

Entering Documents			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select the **Undefined Type Image Container**.  Click rows of **Document Family** and show what is inside the container. Double click one of the rows to show image in external viewer.	An icon appears on the document holder, which informs user that there are images without properties added to the system. We can always check what is inside by selecting it and choosing one of the rows from the **Document Family** on the left.  By double clicking, the original image appears in default viewer. We will focus on orthodontic images later.	

Analysis			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select x-ray lateral image. Click on the image with third mouse button. Context menu appears. Select **New Analysis**.	Now let us create an analysis for the imported lateral x-ray. We need to select the image.  And take some action by either clicking **New Analysis** from the ribbon  or using **New analysis** from the context menu of the image (right mouse button).  A new environment will appear where an analysis is to be executed. Please note that the action in the Navigation bar is changed to Analysis.	For further use: LMB – left mouse button RMB – right mouse button MMB – scroll mouse button

Analysis			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	If group reposition is not active choose **Group reposition** Choose upper left corner of the wrapper, press left mouse button (LMB) and move around. When in desired position, relese LMB. Choose upper left corner of the wrapper, press left mouse button (LMB) and move around. When in desired position, relese LMB.	The last used analysis type landmarks are put to the canvas. Let us start with tracing the landmarks. We see all the elements that are to be traced in gray color on the canvas. Group reposition is a tool which wraps them. There are two ways of tracing, either by Group reposition or Sequential. Let me show you group reposition. By choosing a corner of the wrapper we move all elements together. Let us move it so that point S (Sella turcica) is placed near its location.  We will also move the right lower corner of the wrapper so that all the points and planes are approximately where they should be.	**If no elements appear, it means that the analysis type has not been chosen yet. This happens at the very first analysis after the new installation of the software.** **Use**  **icon to choose desired analysis type. If not selected use "demoAudaxCeph" as an analysis type for this demo.**

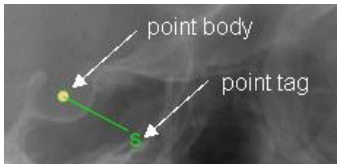
<table>
<tr><th colspan="4">Analysis</th></tr>
<tr><th>#</th><th>Picks</th><th>Technical Specialist Talk Track</th><th>Notes</th></tr>
<tr><td></td><td>Click outside of the wrapper to switch the wrapper off

Focus pointer on a S (Sella Turcica) point body or point tag, press LMB and move it around. Release it in the geometric centre of Sella turcica (as on the image)

Grab point by point and move them to their position. Ask doctor for help.

Occlusion plane is moved by picking green end points or by selecting a plane body (See Users guide on moving so called Single line element on page 22)</td><td>You may note that all the elements are of the same color.

When I am close to a point it changes color to cyan. Now I know that my mouse pointer is snapped to the cyan colored element. I can grab a point at its body or its tag (which is in most cases more convenient). I usually grab the tag.

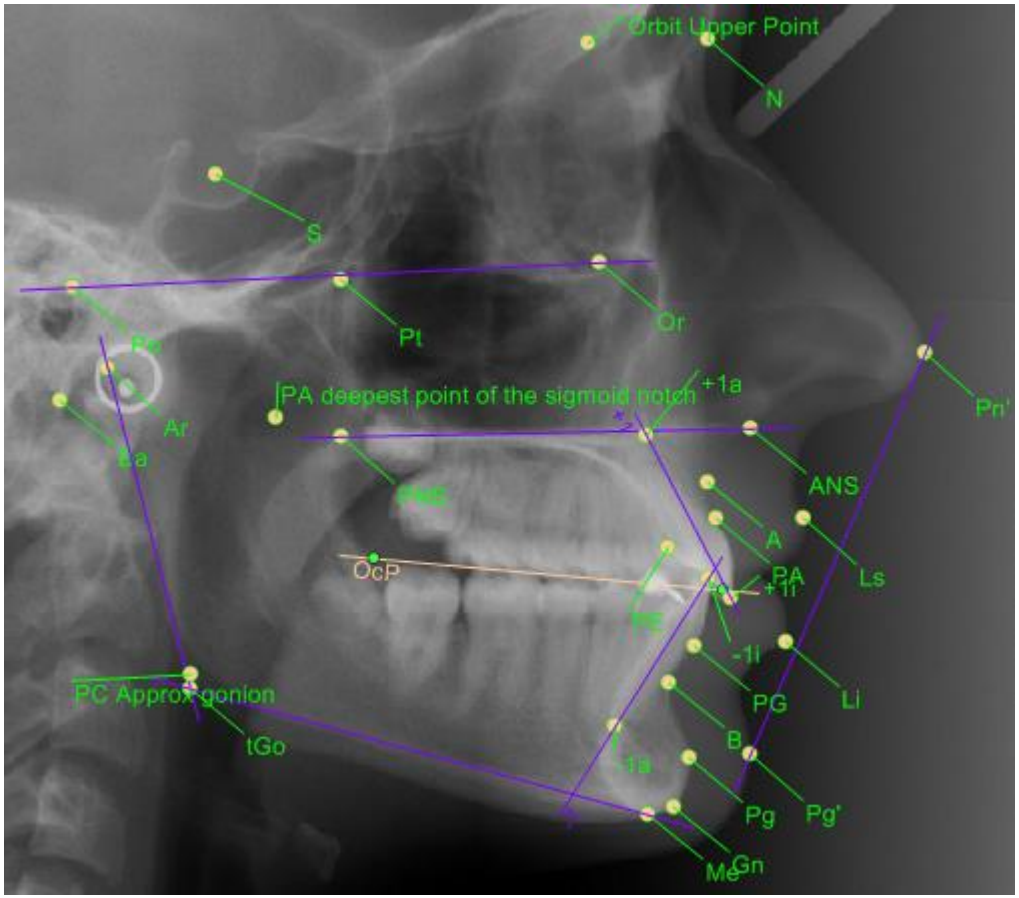
I release it. The color has changed. It is a signal to me that this point or element has already been moved. Now I position other points and planes to their position. You may see that an image in Element image dialog changes with each point, helping me recognize the tissue structures.

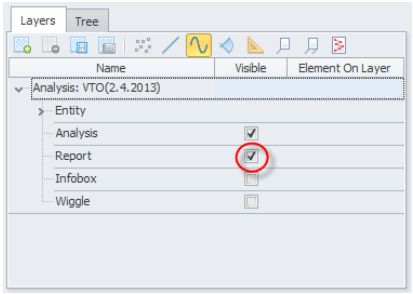
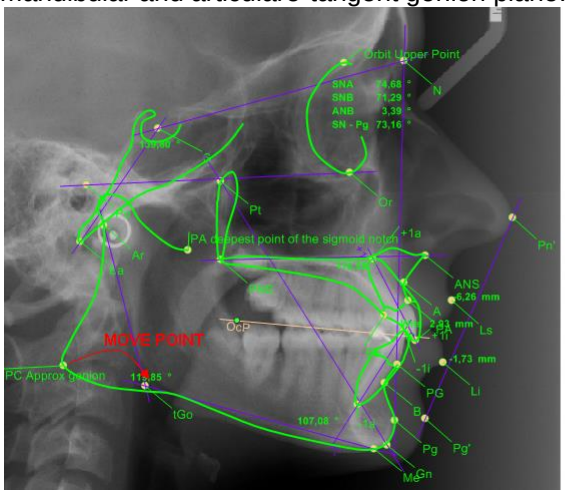
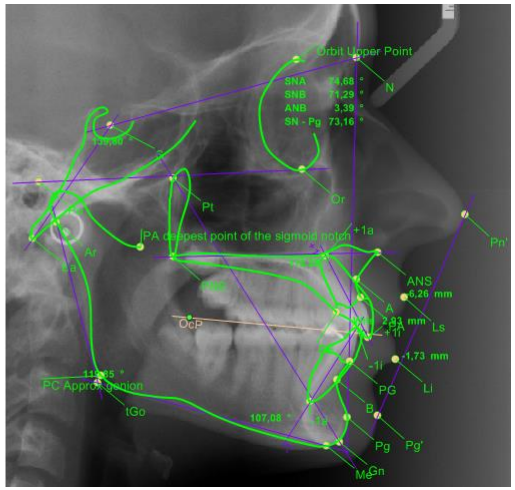
<table>
<tr><td>S</td><td>Sella Turcica</td><td>N</td><td>Nasion</td><td>Po</td><td>Porion</td></tr>
<tr><td>Or</td><td>Orbitale</td><td>Ar</td><td>Articulare</td><td>Pt</td><td>PterygoMaxillary Fissure</td></tr>
<tr><td>A</td><td>A-point</td><td>Ba</td><td>Basion</td><td>ANS</td><td>Anterior Nasal Spine</td></tr>
<tr><td>B</td><td>B-point</td><td>Me</td><td>Menton</td><td>PNS</td><td>Posterior Nasal Spine</td></tr>
<tr><td>Pn’</td><td>Pronasale</td><td>Pg’</td><td>Soft pogonion</td><td>Gn</td><td>Gnathion</td></tr>
<tr><td>Ls</td><td>Laberale superior</td><td>Li</td><td>Laberale inferior</td><td>Pg</td><td>Pogonion</td></tr>
<tr><td>-1a</td><td>Apex of lower incisor</td><td>+1a</td><td>Apex of upper incisor</td><td>OcP</td><td>Occlusion plane</td></tr>
<tr><td>-1i</td><td>Incision edge of lower incisor</td><td>+1i</td><td>Incison edge of upper incisor</td><td>tGo</td><td>Tangent gonion</td></tr>
<tr><td>PA deep.</td><td>Deepest point on sigmoid notch</td><td>PA</td><td>Point on upper incisor on crown edge outside</td><td>PE</td><td>Point on upper incisor on crown edge inside</td></tr>
<tr><td>PC</td><td>Approx gonion point</td><td>PG</td><td>Point on lower incisor on crown edge outside</td><td></td><td></td></tr>
</table>

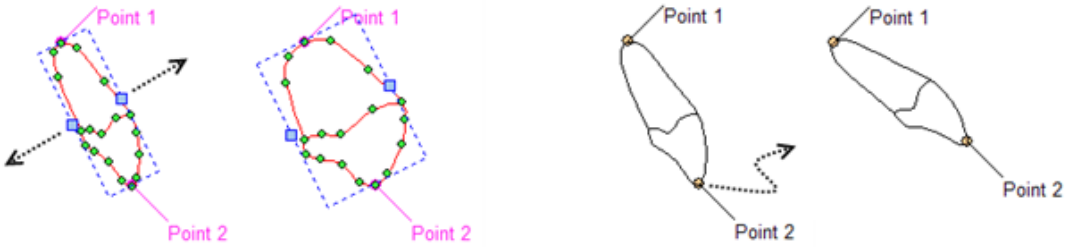
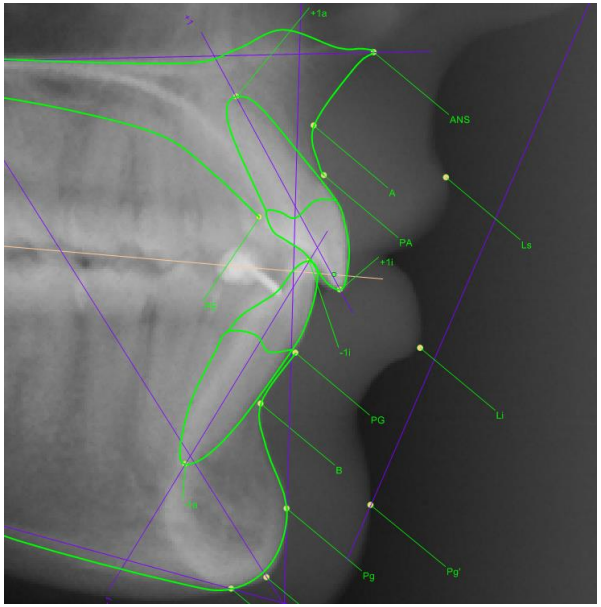
I am not an expert so I may make a mistake. I would appreciate your help at this point.

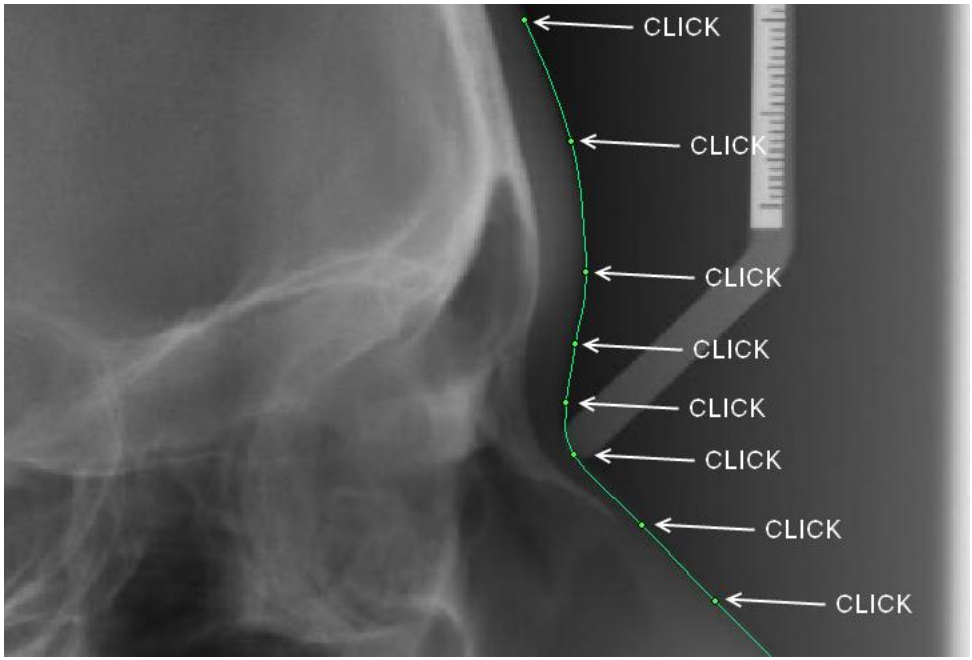
If I press <F2> a zoom window appears with the mouse being always in the centre of it.

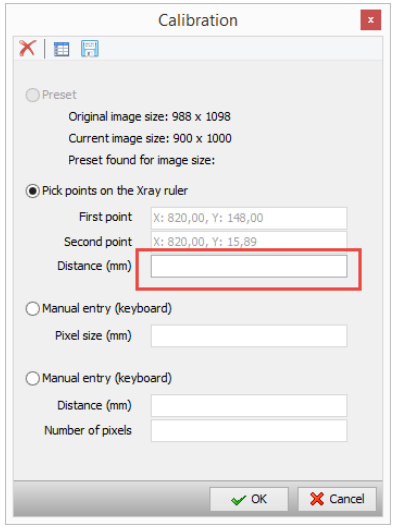
If I press <F3> a window with help pops up. There is an image of selected element on the phantom and a short description of the element.</td><td>Light grey color is one of the settings for unmoved elements.</td></tr>
</table>

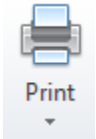
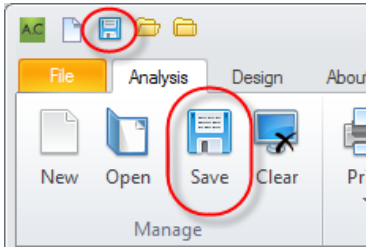
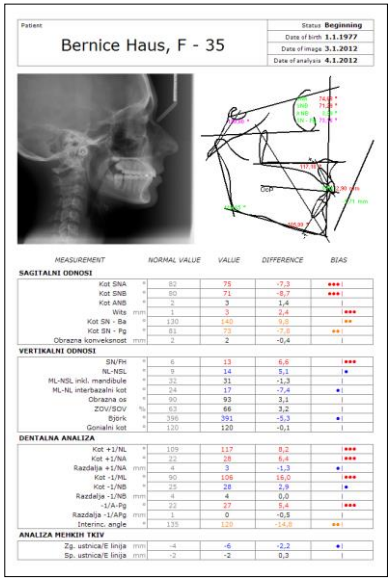
Analysis			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Scroll the wheel on the mouse to zoom in and out Use zoom in/out bar. Grab an image when no elements are snapped and move it around.	 We can scroll the image with a mouse button or use the zoom bar on bottom right. Now all the points are in the right position. We will check if the hard tissue silhouettes are correctly positioned.	

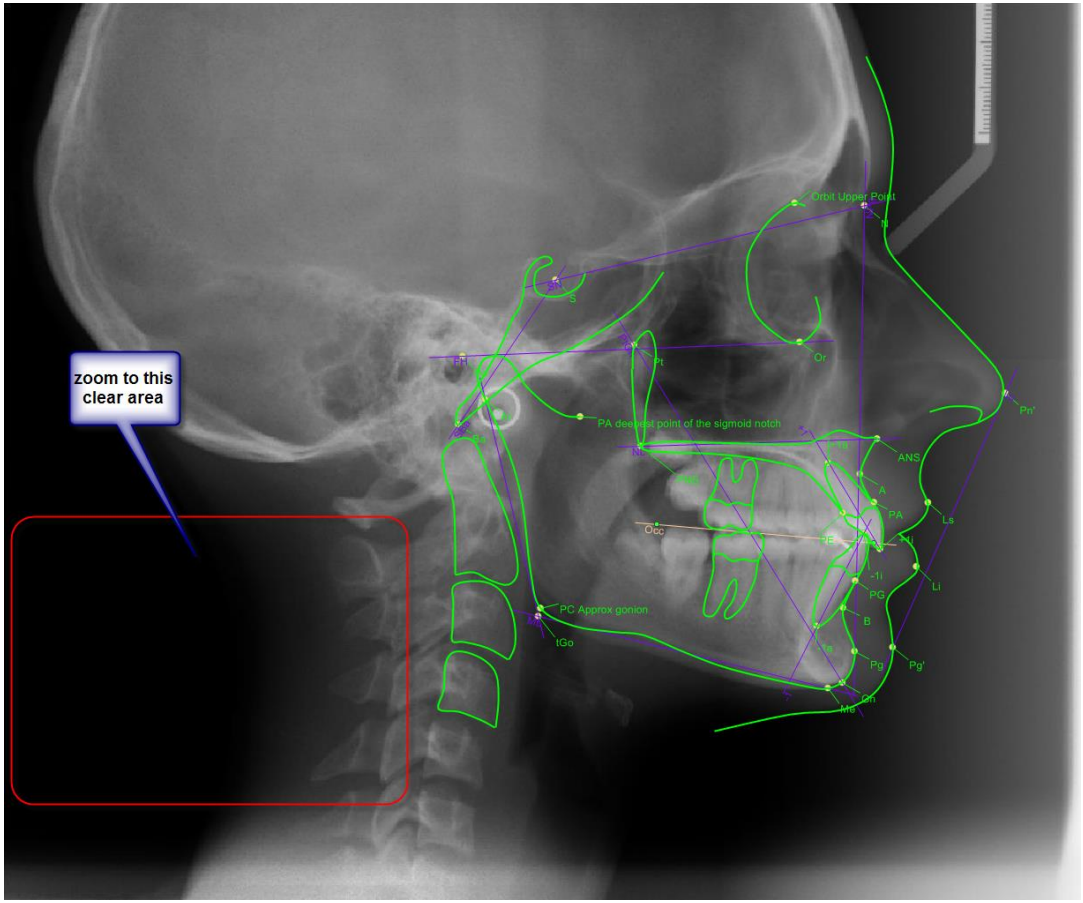
Analysis			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
			
	Check on the Report layer in Layers dialog	I will now show also elements that are to be printed on a report. You may note that hard tissue appeared and some planes as well.	
	Pick PC Approx. gonion point and move close to tangent gonion.	To correct mandible shape, I will move the PC Approx. gonion point so that mandible fits mandibular and articulare-tangent gonion plane.  	

Analysis			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Scroll with a mouse wheel to incisor area. Approach upper incisor silhouette so that it becomes cyan and select it with a LMB. It becomes red and gets a wrapper around it. Drag wrapper and adjust the width. Grab and move point +1i. Do the same for lower incisor.	Now I need to adjust incisor teeth width. I will zoom into the incisors area and select upper incisor. You may note the wrapper with two adjustment squares. I will drag one and the width of the teeth changes.  If I move points which define the axis of the incisor (+1i and +1a) the silhouette will follow. I will change the width of the lower incisor as well. 	

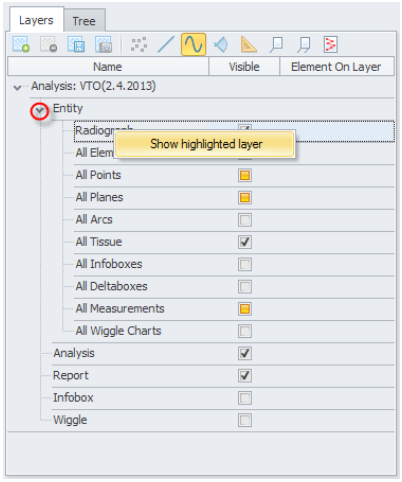
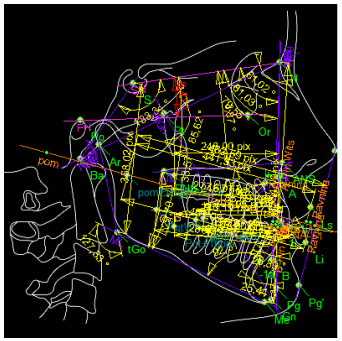
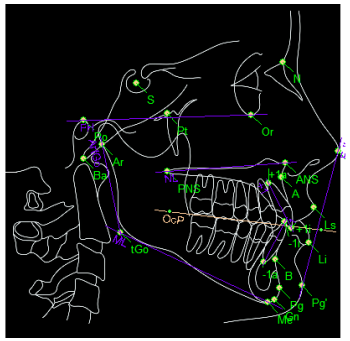
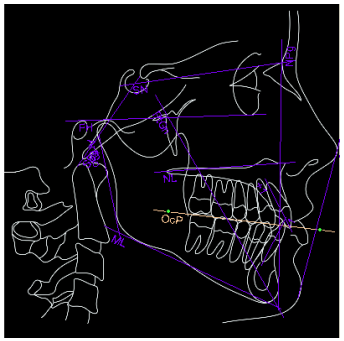
Analysis			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Choose **Silhouette** tool from cognitive features. Click the points. Delete them from a curve by <Ctrl> click on the point Add them to a curve by <Ctrl>-click on the curve Move them by picking and moving around.	I would just like to finish my silhouettes by defining the face profile. I will do this by choosing Silhouette tool and picking outer face profile.  I can always move points and fine tune the silhouette to the profile.	

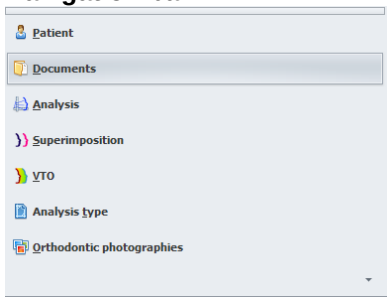
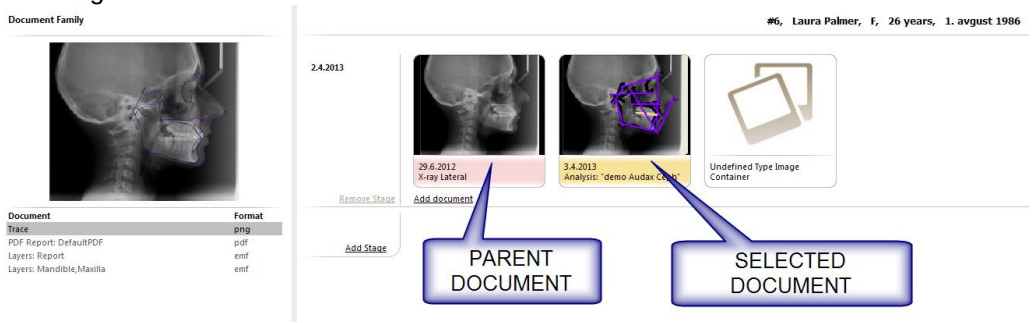
Calibration			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Click the Calibration Icon. Click the first point on the ruler at the Xray image. Click the second point on the ruler at the Xray image. Enter the distance (25mm in our case). Click **Done**.	If there are some distance measurements in the analysis type, I only need to do the calibration before the printing. If the calibration icon is green the image has already been automatically calibrated, based on the image size and previously stored calibration of the same size image. If it is red I need to do the calibration on the fly. I will select the calibration icon and Calibration dialog pops up.  The analysis is finished and without me talking it would last for less than two minutes.	**If there is only 20 mm between picked points, please enter 20 into Distance[mm] field.**

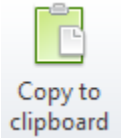
Printing			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select print icon  You can show different styles of predefined reports. Press the **Save** button  	I will select the Print Icon and a report is created.  Bernice Haus, F - 35 It can be printed to any installed printer. There are several report styles predefined. A user has tools which enable her/him to design her/his own report. Saving analysis also saves different types, even custom defined reports and different layers into documents which can be later used for preparing a consultation or an offer to the patient. All the documents are in vector format which means that they can be resized to any extent and will not lose quality. Saving our document will result in creating three documents associated to our analysis: (a) a report, (b) a report network in vector format and (c) a mandible and maxilla layer in vector format.	

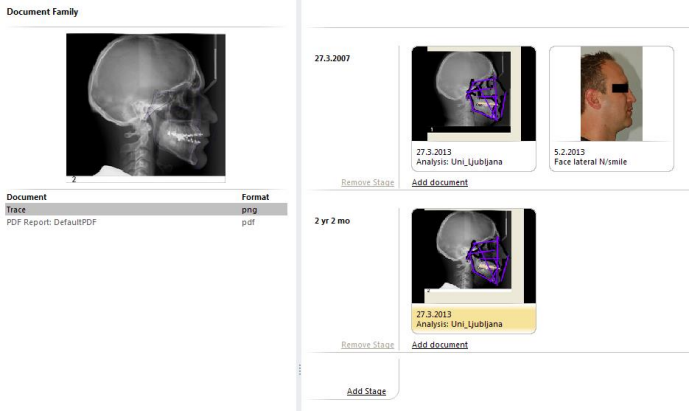
Technology			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Close the print dialog. Zoom in to the area on the image.	At this stage I would like to show how AudaxCeph works. In its mathematical core it uses so called cognitive features, which means that they are aware of their parents and properties. This means that if a plane goes through a point and the point so moved, the plane (which is a child) will move as well together with the point (which is a parent). Let us research this a little bit more.  	**An example of geometry creation is in the video techAxCEPH.flv which is a part of demo files. You can use VLC player to see the video.**

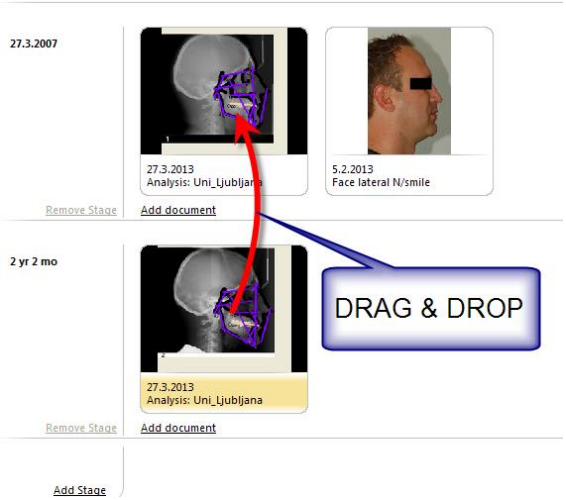
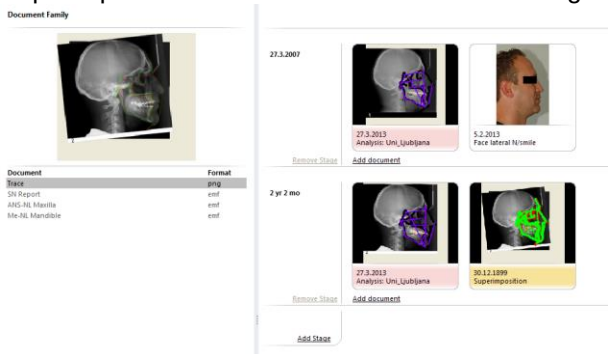
Technology			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Please take a look at the movie techAxCEPH.flv. Wave the story about what are your picks. Follow picks in the movie. 1. Create three points 2. Connect two points with a plane 3. Make a new plane parallel to the first one through third point and with a free end (move second point) 4. Make another point and a plane through it with other free end 5. Make a crossection point 6. Watch mechanism movement 7. Add linear and angular dimensions 8. Watch the changes appear in realtime when moving points	I would just like to show the technology which works for us and is waiting for you to explore it. We will create a simple “mechanism” consisting from geometry and design intent. So first here are three points and a plane connecting first two points. I will add a plane which will always be parallel to the first one even if I change the orientation of the first one by moving one of parent points. I will intersect previously created planes with the third one and create a point on a cross section. When I move some point, the mechanism moves accordingly. By adding measurements and we complete our mechanism. You may note that measurements change in real time when the geometry changes. This philosophy is used in AudaxCeph. Whenever a point/landmark or plane is moved all the measurements are updated. By positioning them correctly, all the measurements have the right value.	**You need a movie techAxCEPH.flv from demo files. Use VLC player.** **Elements are found on the Design tab of the ribbon.**

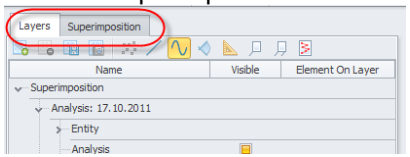
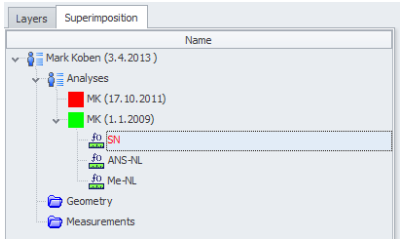
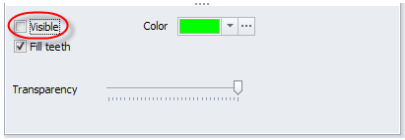
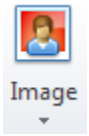
Technology			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	 Open tree in front of **Entity**. RMB on **All elements** pops-up **Show highlighted layer**. Use it. Move point Nasion, to show that it works in real time. Do the same separately for **Analysis** and **Report** layer.	An analysis type is really very crowded mechanism. I switch on the visibility for all elements you may note the importance of good layer organization. Elements which are needed for performing an analysis are stored on the Analysis layer, the ones which are to be printed are stored on the Report layer etc.  All elements  Analysis  Report Moving point around will influence changes in measurements. It is nicely seen all the changes associated with for example Nasion movements.	

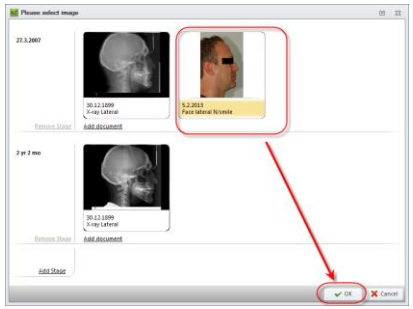
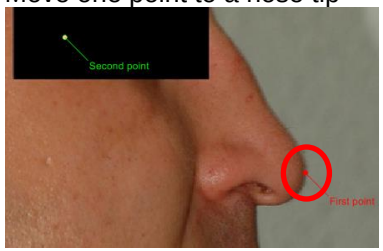
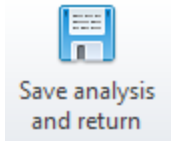
Document Family			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Click Save 	Whenever an analysis is saved, some documents are saved as well. This depends on the predefinition of reports inside the analysis type which is currently in use.	
	Click on **Documents** in the **Navigation bar**.  	We will go now back to Documents.  We can notice a new document “analysis” created from “demo Audax Ceph” analysis type. When selected its footer is yellow and its parent document (in this case x-ray lateral image) is in red color.	
	Click on each row in the Document Family to show a preview of a document	Analysis has an image of tracing itself and other three documents attached. We can have a quick look at them in the preview window.	
	Double click on a document (row) in a document family. Show deliverables	We can also view high quality document by double clicking on it. It appears in main window. It can be printed, sent to clipboard, sent by email,…	**Software switched the Documents ribbon to Viewer ribbon.**
	At the end, double click on row **Layers: Mandible, Maxilla**	We can see a vector image of mandible and maxilla together with a scale and patient data.	

Document Family			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Zoom in and out with a MMB wheel on the mouse. Click on **Copy to Clipboard icon**.  Alt-Tab to MS Word. Paste document to a blank page. Go back to AudaxCeph and switch to Documents ribbon tab.	We can zoom the document, send it, put to the clipboard and paste to for example Word document. Always a vector format is pasted and it can be resized to any size. This is a nice way for adding media material to a presentation for patient, treatment plan or perhaps an offer.	

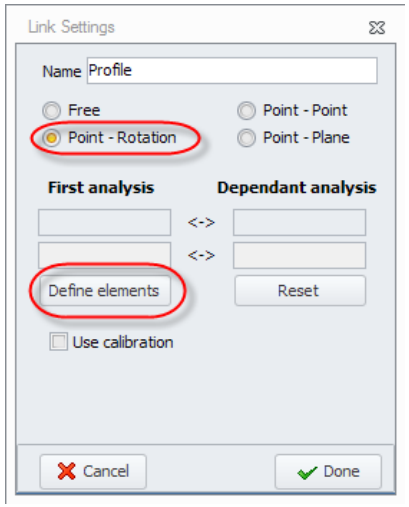
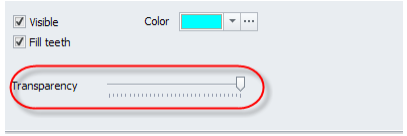
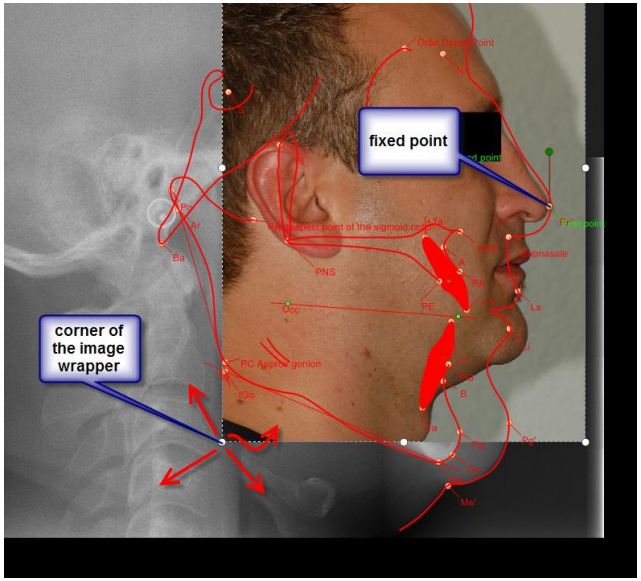
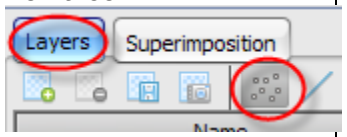
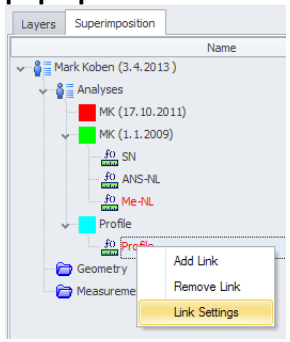
Superimposition			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **Patient** option on the **Navigation bar**. Create a new patient **Mark Koben** **1.july 1986** **Male** Press **Save** button. Double click on the date and roll it back for two years from today's date. Drag analysis **MK_1.acx** and drop it in the documents holder. Drag **MK-latPhoto.jpg** and drop it in the documents holder. Click on **Add stage** label and press **OK** button from Stage properties dialog. Drag analysis **MK_2.acx** and drop it in the documents holder.	To show superimposition I will create a new patient, add two analysis from different stages of the treatment, add a lateral photography to documents. We can drag and drop images and other types of documents as well. After creating a new patient I grab analysis which was made a few years ago and drop it into the first stage. We have an image of the patient from that time and I want it on the initial stage as well. To simulate time span we create another document holder. It shows the time span from the initial stage. The later analysis is to be put on the later stage. 	

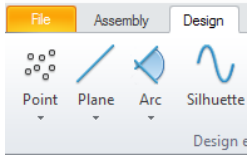
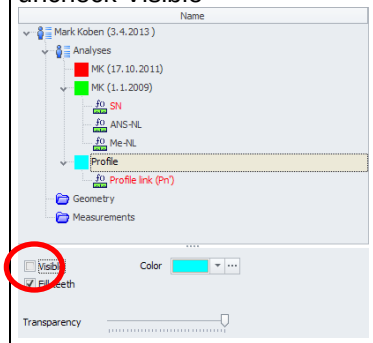
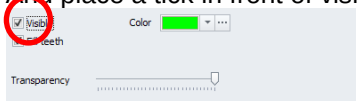
Superimposition			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Drag second analysis on the first and wait for the reports to be created.	When both analyses are in place, we drag the later to the first one. Based on definitions inside the analysis type which was used to create an analysis, all the links and reports are created without any work.  Superimposition is created in a second or two together with attached documents.
	Click through Document family as before with an analysis.	 It is put to the last stage document holder and when selected (highlighted in yellow), both parent analyses are highlighted in red. At the same time documents appear in Document Family panel.	

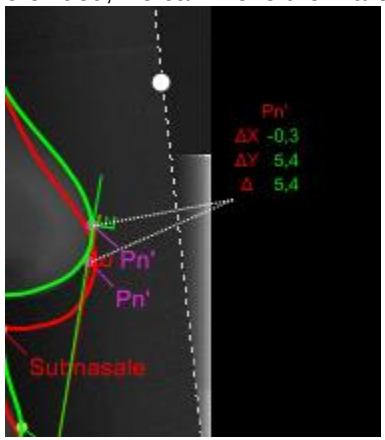
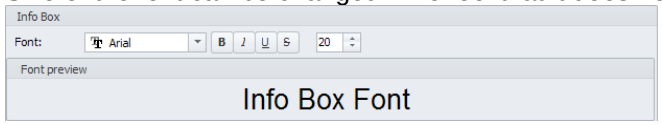
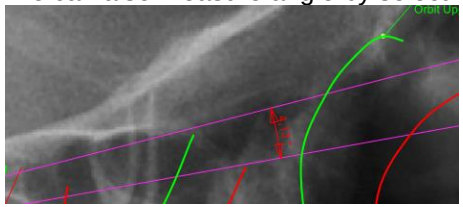
Superimposition			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Double click on the superimposition on document holder. Click on Superimposition tab  Click between different links  Uncheck Visible  Press **Image** button in ribbon.  Select lateral photo and confirm Selection.	To see all the links I open a superimposition with a double click on it. The environment changes to the one appropriate for overlaying analyses and images on top of each other. We can always control what we want to see on the superimposition with layers either shown or hidden, we can always switch between different strategies/links of superimposing in the Superimposition tab. Analyses are in different color which is seen in the assembly tree. By selecting different links the assembly changes as well. For best navigation the active link is highlighted. I would like now to add photography of the patient to the superimposition. To make the assembly more clear I will temporarily hide the second analysis. We have already stored lateral image of the patient to our system. We just need to select it and place it over the analysis.	

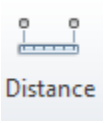
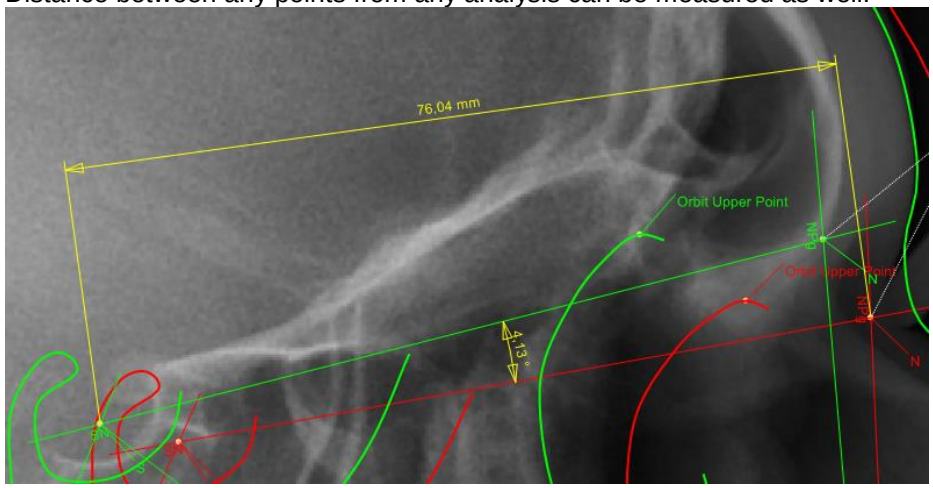
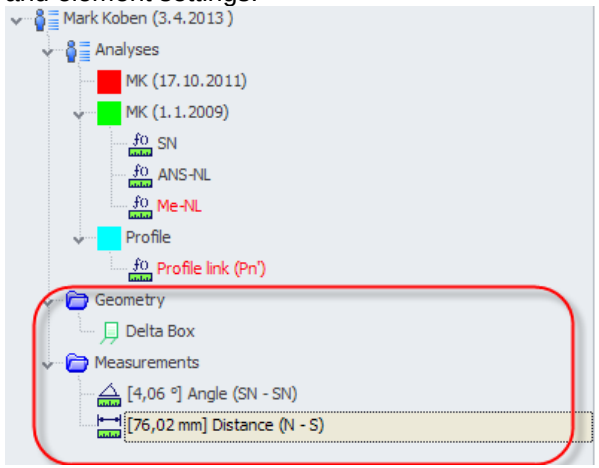
Superimposition			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
		When an image is selected we are brought into environment which will help us to handle the placement better.	
	Move one point to a nose tip 	Two points appear on the image and I will place one as an anchor for my point-rotation way of overlaying photography over analysis. The most prominent point on the nose is very suitable for this action. So I will move one point to the tip of the nose.	
	Press **Save analysis and return** 	Let us go back and place the image.	

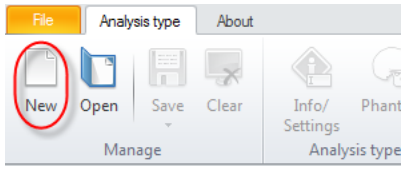
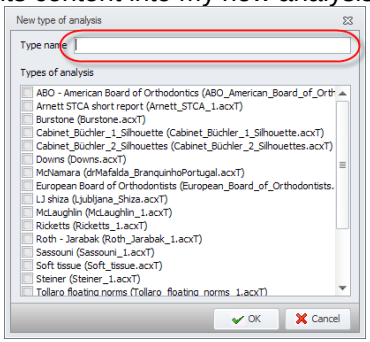
Superimposition

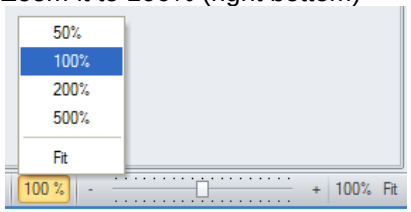
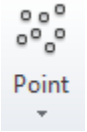
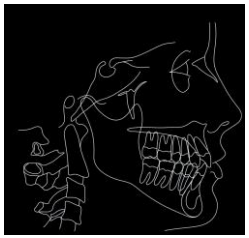
#	Picks	Technical Specialist Talk Track	Notes
	 Select **Point-Rotation** option and press **Define elements** button. Select Pn' (on analysis) and First point (on the image) as a point references which are to be aligned. Grab the corner of the image wrapper and travel with it on the canvas. Note the resizing and rotation of the image. 	Point – Rotation is an option where we fix a point and then by grabbing a corner of the image we rotate and resize it about the rotation center, which in this case is the selected point at Pronasale. Aspect ratio remains the same and image is quickly and accurately placed to the right position.  The same way of superimposing is possible with an analysis. So we can for example superimpose using a point on the posterior border of symphysis of the mandible and mandibular nerve. When we are done, we can change transparency of the image a little bit, by using a slider. .	**If the tip of the nose is not visible show points by clicking Layers and Point icon.**  **When points appear, click Superimposition tab to show the assembly tree.** **If Link Settings dialog is not present use RMB to pop up context menu**  **Use Link settings.** **NOTE!!!!!!** **Use Calibration MUST be unchecked.**

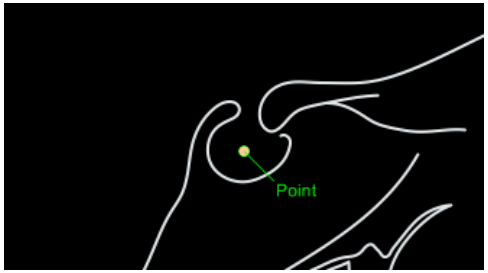
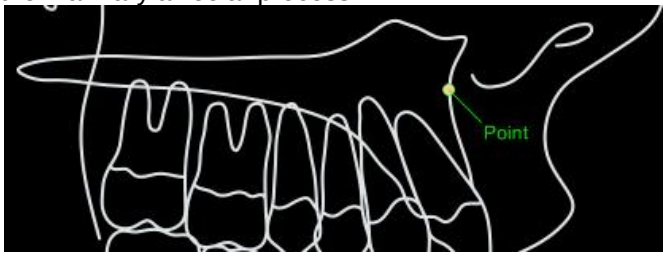
Superimposition			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Press **Save** button 	When saving the assembly, predefined reports will be created and attached to the superimposition.	
	Switch to **Documents** in the **Navigation bar** and show the Document Family	We can perform the same actions with them as with analysis, so copy, send by e-mail,…	
	Switch to **Design** tab. 	Assembly not only allows for superimposing and creating nice images, it also offers tools so that we can create assembly geometry, MEASUREMENTS between points, copy elements. These tools are especially useful when we study growth or treatment progress. Tools are available under Design tab in the ribbon and act exactly the same as within the analysis or analysis type creation environment.	
	Select Profile from tree and uncheck Visible 	To show a measurement I will first hide patient's image and made both the analyses visible.	
	Select second analysis (green) And place a tick in front of visible. 		

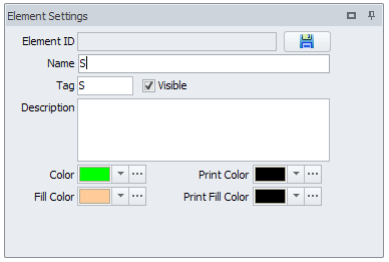
Superimposition			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Choose Me-NL link. Switch to Design tab and choose **Deltabox**. Select Pn'. Use <Ctrl>+LBM to move the deltabox to another position.	There are several tools which help doing different measurements: Delta box, Distance and Angle. Delta box measures x, y and distance between the same point in both analyses. If too crowded, we can move them around. Delta box points to both points from the pair.  Size of the font can be changed if we feel that it does not fit our needs.  We can also measure angle by selecting two planes. 	**Change size of the font using the same settings as for mBox** **File>Configure**
	Choose **Angle** tool from the ribbon. Pick SN planes in both analyses. 		

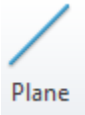
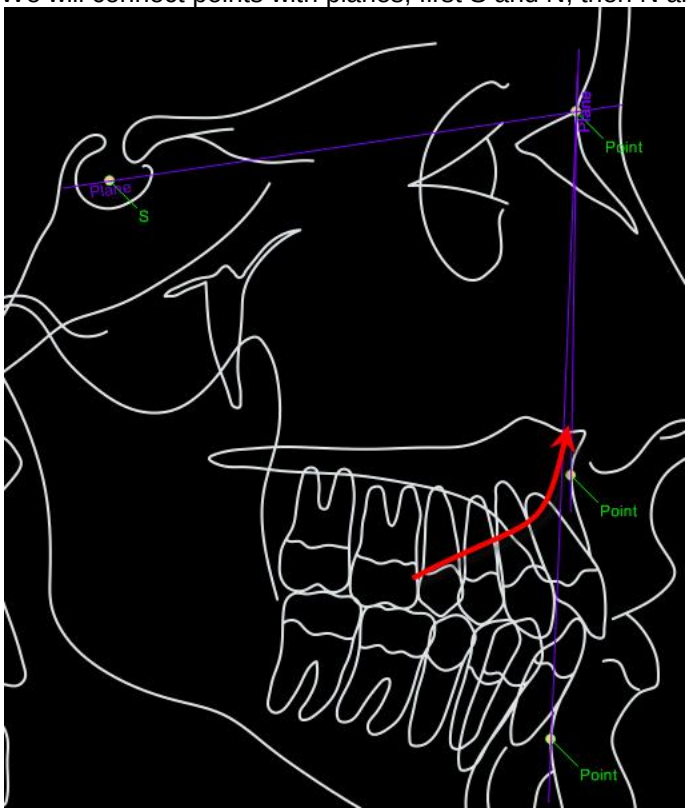
Superimposition			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Choose **Distance** tool from the ribbon.  	Distance between any points from any analysis can be measured as well.  I can show the use of additional tools. It is best illustrated if we want to do the superimposition based on fixed structures. All assembly elements can be managed with a help of model tree, context menu on RMB and element settings.  	**-----Superimposition based on fixed structures is covered in a separate chapter.-----**

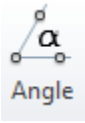
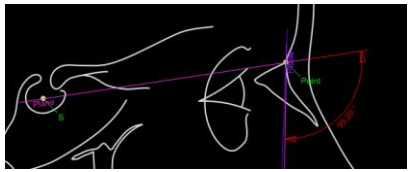
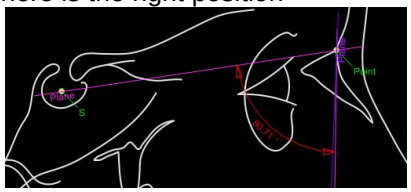
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **Analysis type** tab from the Navigation bar.	Almost every dental school has its own way of doing and representing cephalometric analyses. Some of them are named by their author the others by their origin: Ricketts, Ricketts 12, Steiner, Steiner Bonn, Steiner, Berlin, McNamarra, Downs, Swartz, Bergen, Oslo, Zurich, Jarabak, Sasouni, Bishara,.... and 400+ others It is virtually impossible to gather all the options in one software in advance. Also doctors have their own wishes and want to enrich or reduce number of measurements, which are available in a given analysis type. Audax Ceph is a tool which has a modeler of analysis types. We define points/landmarks, planes, circles, arcs, add measurements, define standard values and attach them to measurements, create and design reports and exports to spreadsheets. There are three ways way we can start 1. from scratch (where we start from nothing) 2. from previously saved analysis (where we enrich or reduce an existing analysis type) 3. from predefined elements (where measurements are selected from predefined elements bank	
	Select **New** tool on the **Analysis type** ribbon. 	I will go through the process of creating a simple analysis type including some angles SNA, SNB, ANB and WITS distance measurement. When New type of analysis dialog appears I can select one of existing analyses and copy its content into my new analysis type. 	

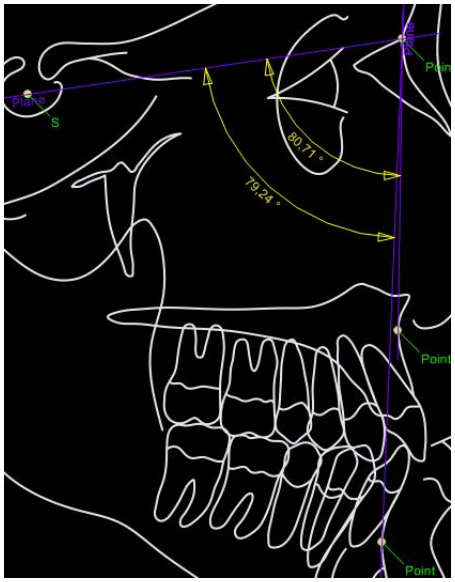
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Type any name in the line editor and press **OK** button. Zoom it to 100% (right bottom)  Select **Phantom** tool on the **Analysis type** ribbon and click on it to show phantoms. Stop when lateral phantom appears again. Select **Point** tool on the **Analysis type** ribbon  	But I will do it from scratch, so I will not select anything. I enter a new analysis type name and continue to phantom picture selection. Phantom picture appears and helps us to organize our tracing points and planes It can be zoomed in or out. Phantoms can be also PA or clay model, which means that we can do also these kind of analysis types.  lateral phantom To measure SNA, SNB and ANB I need S, N, A, and B landmarks B – Point B	

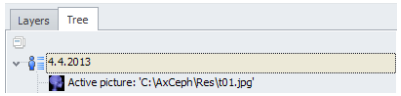
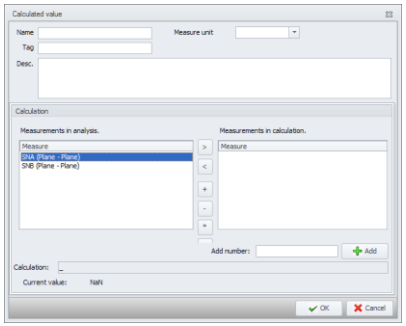
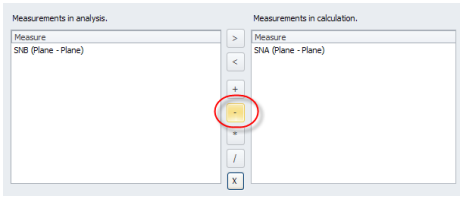
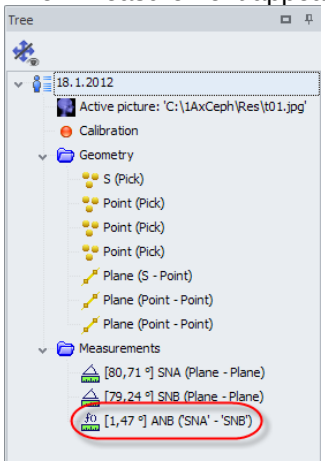
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Place the point in the place of Sella Turcica (geometric centre)	S – Sella Turcica (Turkish saddle in the geometric center) 	
	Press **<F4>** key to repeat the last point element selection (you do not need to select the **Point tool** again; **<F4>** repeats this command). Place the point in the place of N.	N – Nasion located on the most anterior aspect of the frontonasal suture. 	
	Press **<F4>** key to repeat the command (you do not need to select the **Point tool** again; **<F4>** repeats this command). Place the point in the place of A.	A – Point A is the most posterior point in the concavity between anterior nasal spine and the maxillary alveolar process 	

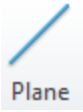
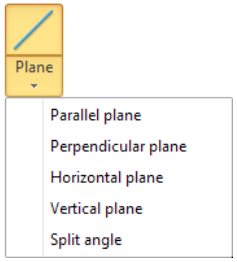
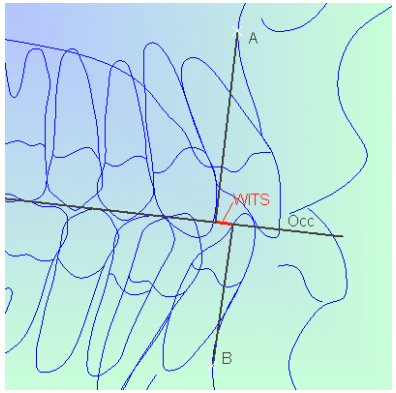
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Press **<F4>** key to repeat the command (you do not need to select the **Point tool** again; **<F4>** repeats this command) Place the point in the place of B. Pick the first point placed in sella turcica. Pick Name field in Element settings dialog Name it **S.** !!!! If you want you may change add an thumbnail image to each element or at least one. Select an element and click **plus** button in Upper panel of **Element Settings** panel.	B – Point B is the most posterior point in the concavity between the chin and mandibular alveolar process. Points as well as other elements have their properties such as name, tag, visibility, color, color for report, description. I will change the name of the first point that was placed on the phantom. You can notice that the name of the point on the canvas has changed. I can also put in the description, perhaps add an element image.  We can do this for each element, but I do not want to waste your time with it right now.	

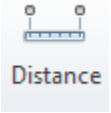
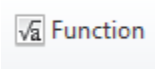
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **Plane** tool on the **Analysis type** ribbon.  Pick Sella and Nasion Press **<F4>** button Pick Nasion and A Press **<F4>** button Pick Nasion and B	We will connect points with planes, first S and N, then N and A, finally N and B.  	
	Grab point A and move it from right to left and back to its position	One of measurements is angle ANB which could be negative or positive, which is of great meaning to an orthodontist. It is positive if point A lies on the right side of plane NB and negative if it lies on the left side of NB.	

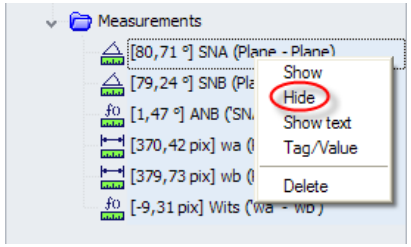
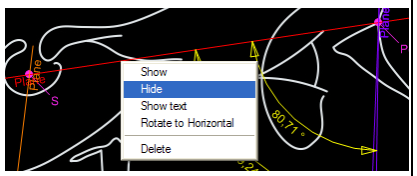
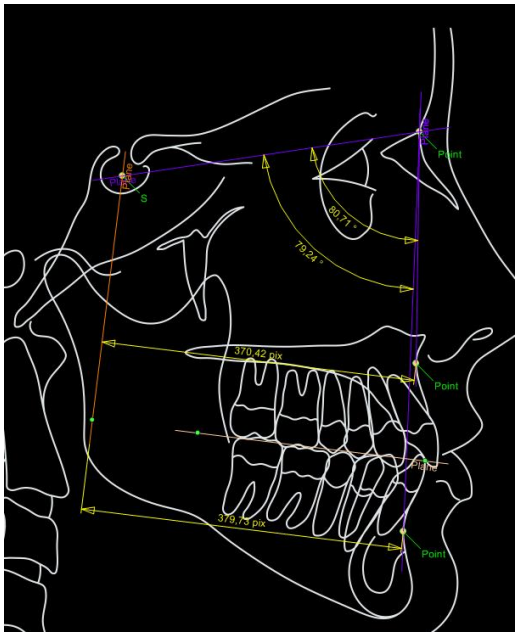
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **Angle** tool on the **Analysis type** ribbon.  Pick plane SN and NA. !!!! NOTE if an angle appears on the right side of NA press **<CTRL>** and pick right under the SN  here is the right position  Press **<F4>** button Pick plane SN and NA.	I will first create SNA angle measurement. I can do this by picking either two planes: SN and NA or three points S,N and A. !!!! NOTE if an angle appears on the right side of NA I can always change the position of the angle I will do the same for SNB.	

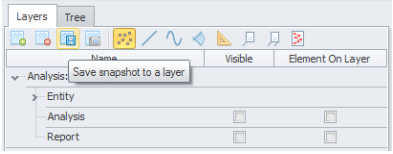
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Pick the first angle and enter the name SNA in **Name field** in **Element Settings dialog** Pick the second angle and enter the name SNb in **Name field** in **Element Settings dialog.** Select **Function** tool on the **Analysis type** ribbon. √a Function	 Now I will give name to both angles this one is SNA the second is SNB ANB is a value equal to SNA subtracted by SNB.	

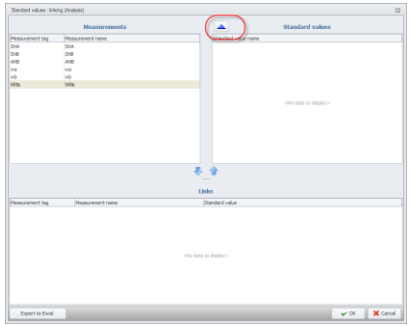
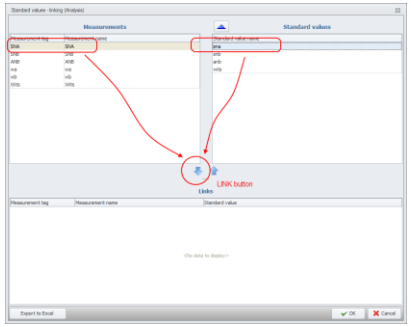
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Doubleclick SNA Click **minus** button Doubleclick SNB. Click in **Name** field and enter ANB. Select degrees in **Measurement unit** drop down. Switch to **Tree** view.  Move point A and show the change on the tree from positive to negative Place point A back.	I will create ANB measurement by using Calculated value dialog.   We need to give a name to a new measurement and unit. A new measurement appears in the model tree.  The value changes if I move points.	

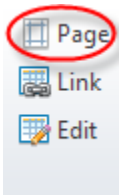
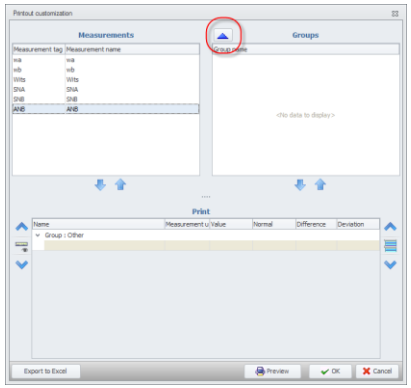
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **Plane** tool on the **Analysis type** ribbon.  Place a plane as on picture right. Select **Perpendicular plane** tool on the **Analysis type** ribbon.  Pick occlusion plane and then pick point S.	I would like to add additional measurement called WITS. It is a distance from A to B projected on the occlusion plane.  . I will first create the occlusion plane and then a plane which is perpendicular to occlusion plane and goes through point S.	

Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **Perpendicular plane** tool on the **Analysis type** ribbon.  Pick point A and perpendicular plane Give a name wa to this dimension. Pick point B and perpendicular plane Give a name wb to this dimension. Select **Function** tool on the **Analysis type** ribbon.  Subtract wb from wa (wa-wb) Click in **Name** field and enter **Wits**. Select **mm** in **Measurement unit** drop down.	I will now create two linear dimensions: one from A to perpendicular plane and the other from B to the perpendicular plane. The difference is WITS. I will use the same steps as before to create calculated value dimension.	

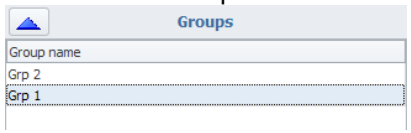
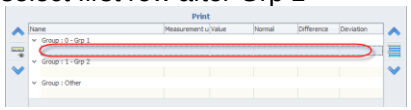
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	<Shift> select all measurements from the model tree. Press third button on the mouse and select **Hide**.  Select planes one by one and press third button and select Hide from the context menu. 	I have already created 4 cephalometric measurements and my image is quite crowded. I will select all measurements nad hide them.  I will also hide all planes except occlusion plane.	

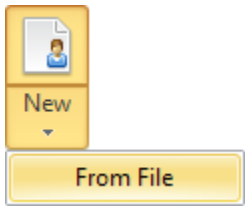
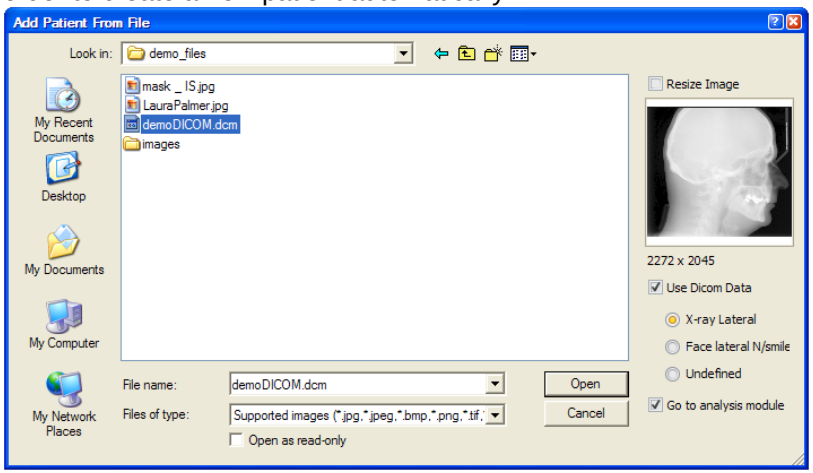
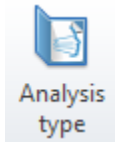
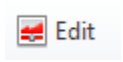
Analysis type creation			
#	Picks	Technical Specialist Talk Track	Notes
	Highlight the Analysis layer in Layers dialog.  Press **Save snapshot to a layer** button. Remove tick from checkbox Add tick to checkbox. Select **Link** tool on the **Analysis type** ribbon. 	What is left are four points an an occlusion plane. This is exactly what I need to do my tracing and obtain SNA, SNB, ANB and Wits. I will put them to the Analysis layer. If I switch the layer off all elements disappear and I bring them back by puting a tick to checkbox of Analysis layer. At this point measurements are not aware of their standard values. They may differ from one race to another, be dependent on sex and age, dentition, ... Standard values can be taken from scientific articles or books for local population.	

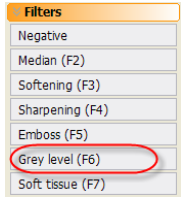
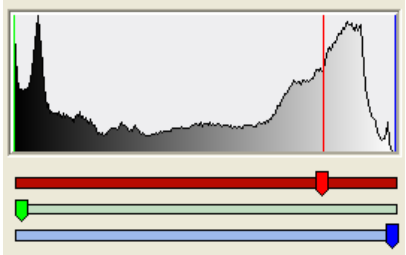
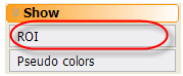
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Click button. 	I want to enter standard values for my measurements. They can be either entered manually or imported from other analyses, excel file.	**Show Excel import/export only if Excel is installed on your system.**
	Select **Import** button from **Standard values dialog** and select Demo.xls. Press **Open** button from file select dialog Pres **OK** in **Standard values dialog**. 	I will import some standard values from an excel file. We will now link measurements from both sides (Measurements and Standard Values). For example we first pick SNA from Measurements on left and sna from Standard Values on right.	

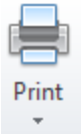
Analysis type creation			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Highlight **SNA** in left. Highlight **sna** or right. Press Link button. Do the same for SNB, ANB and Wits. Press **OK** in Standard values – linking (Analysis) dialog.	I will link all four measurements.	
	Select **Perpare report** tool on the **Analysis type** ribbon.  Press **Add group** button. 	The only thing that we need to do is to create a report. We will put measurements into two groups.	

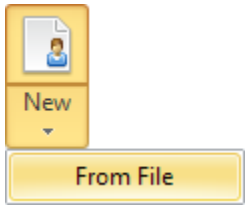
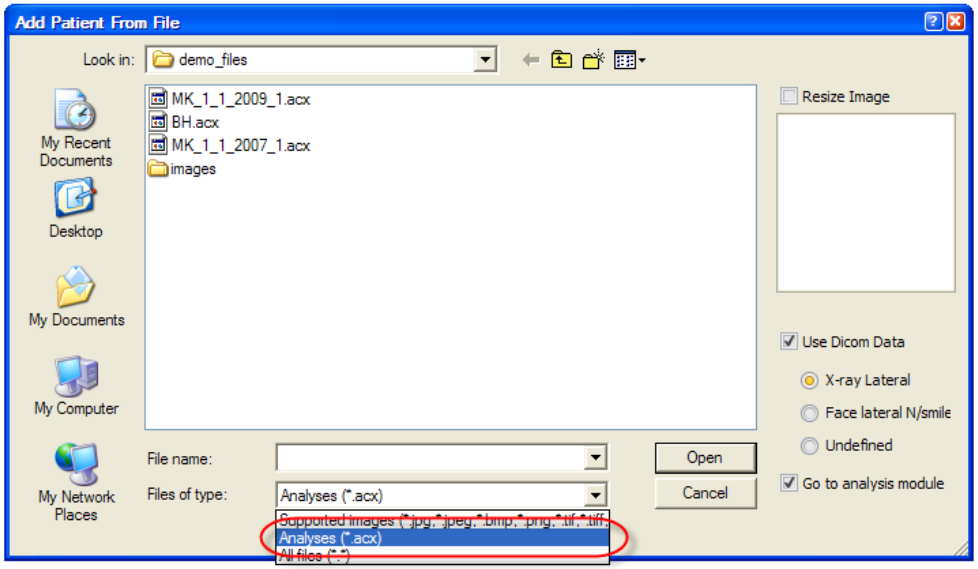
Analysis type creation

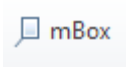
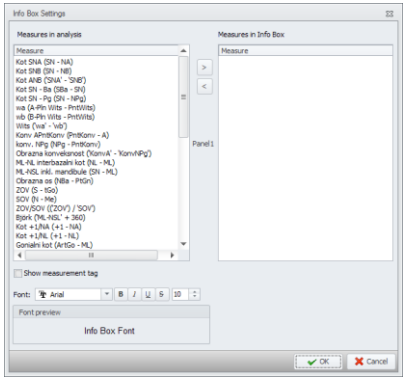
#	Picks	Technical Specialist Talk Track	Notes
	Press **+ button** and enter Grp 1. Press **+ button** and enter Grp 2. Press **OK button**. Double-click on Grp 1 Double-click on Grp 2  select first row after Grp 1  Double-click SNA. Double-click SNB. Double-click ANB. Select first row after Grp 2. Double-click ANB. Press **Preview** button. Close preview. Press **OK** button in **Printout customization** dialog Select **Save** tool on the **Analysis type** ribbon. .	One is Grp1 the second is Grp 2. I will put groups in report by doubleclicking on each of them. I will place SNA, SNB and ANB in group Grp 1 And I will place Wits in Grp 2. Name / Measurement u / Value / Normal / Difference / Deviation Group : 0 - Grp 1 SNA [°] 80,71 SNB [°] 79,24 ANB [°] 1,47 Group : 1 - Grp 2 Wits [pix] -9,31 Group : Other I can look at the preview to verify the report. I will now save my newly created analysis type. **(REMEMBER THE NAME for later use)** **At this stage we can also define (a) the documents to be created when an analysis is saved for example report or tracing network and (b) the superimposition links for automatic dragg & drop superimposition and (c) MS Excel export template.**	

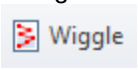
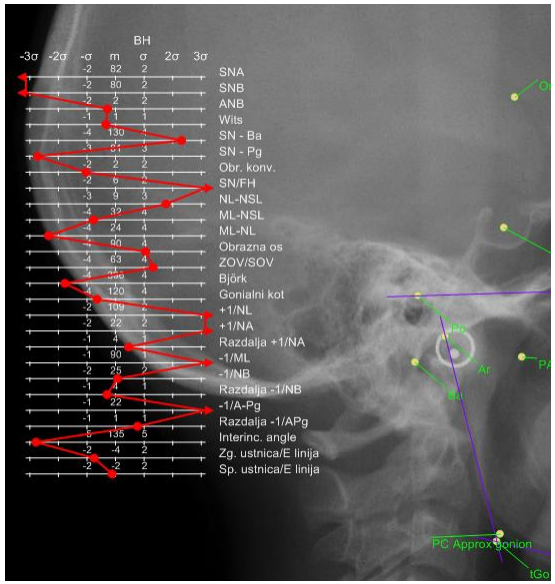
Digital filters			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Click **Patient** in **Navigation bar.**  Use From File option and find **demoDICOM.dcm.** Press **Open** button**.**	We will use our already created analysis type on another radiograph. This is a dicom file which includes patient data (name, date of birth, etc.) in its metadata. We can use this in order to create a new patient automatically 	
	Press **Analysis type** button from the ribbon. 	Using Dicom data for patient creation, recognizing image as lateral x-ray and an option ticked to go directly to Analysis module we are brought to analysis creation environment. We will now select another analysis type which has already been saved. Points and planes are replaced with a new ones.	
	Select newly created analysis type **Confirm** a new analysis type selection.	The image is too bright for tracing. We will use some digital filters to make it more appropriate.	
	Select **Edit** tool on the **Analysis** ribbon. 	A new window appears where we can do the filtering.	

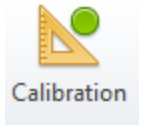
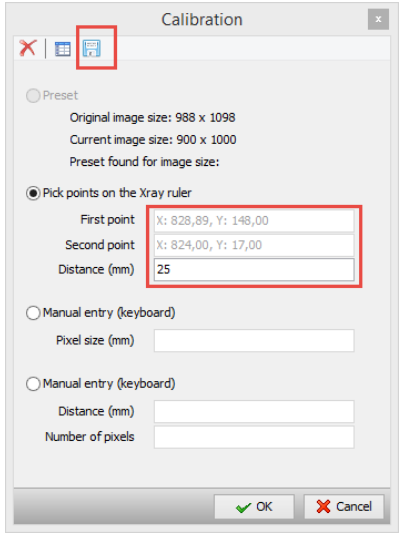
Digital filters			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Press **Grey level**  In grey level dialog set RED bar to about the position in the image.  Press **OK** button. Select **ROI** from **Show** section.  place it as on image Select **Soft tissue** filter. (!!!!!! repat again if necessary) Press **Save lossless** button.	I will first make the radiograph darker. Making whole image darker, hides the profile of the face, which is needed in cephalometric analysis. The image is 12 bit grey level radiograph, which means that more than 4000 grey levels are available. I just need to emphasize the right ones. I will select the region of interest and apply appropriate filter. It is so-called Soft tissue filter.	

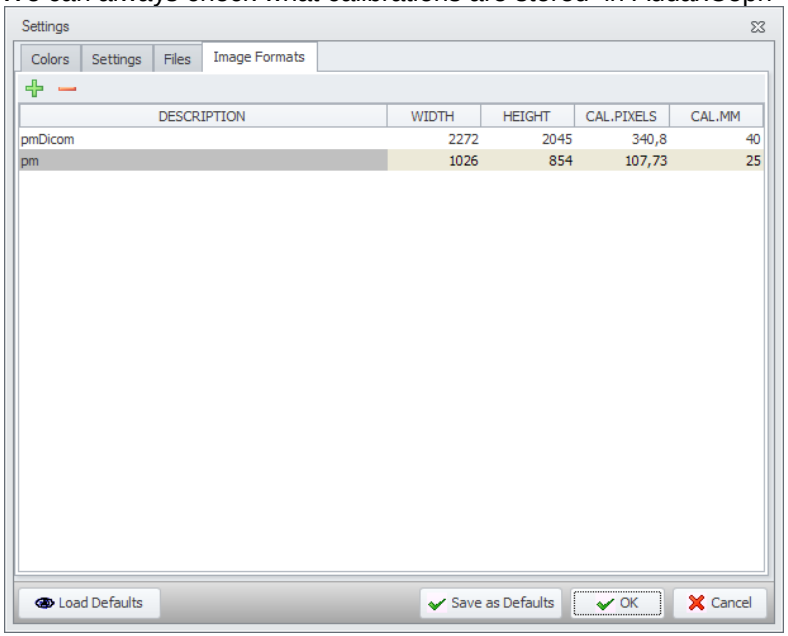
Digital filters			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Place points and occlusion plane. Calibrate the analysis. Select **Print** tool from Analysis tab on the ribbon  	Now I am back, I just need to place points on the right position, define occlusion plane and calibrate the analysis. We can check the report and you can see both groups and measurements which are put into them.	

New Patient From Existing Analysis, mBoxes			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Click **Patient** in **Navigation bar.**  Use From File option and find **BH.acx.** Press **Open** button**.** .	A new patient can be created also from an existing analysis stored on disk. If we are sent analysis from our colleague, we use New Patient> From File and select an analysis which has been sent to us. This will create a new patient and her/his document placeholder with one stage.  A new patient is created and we are brought directly to analysis environment.	

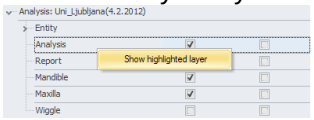
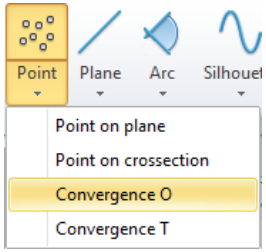
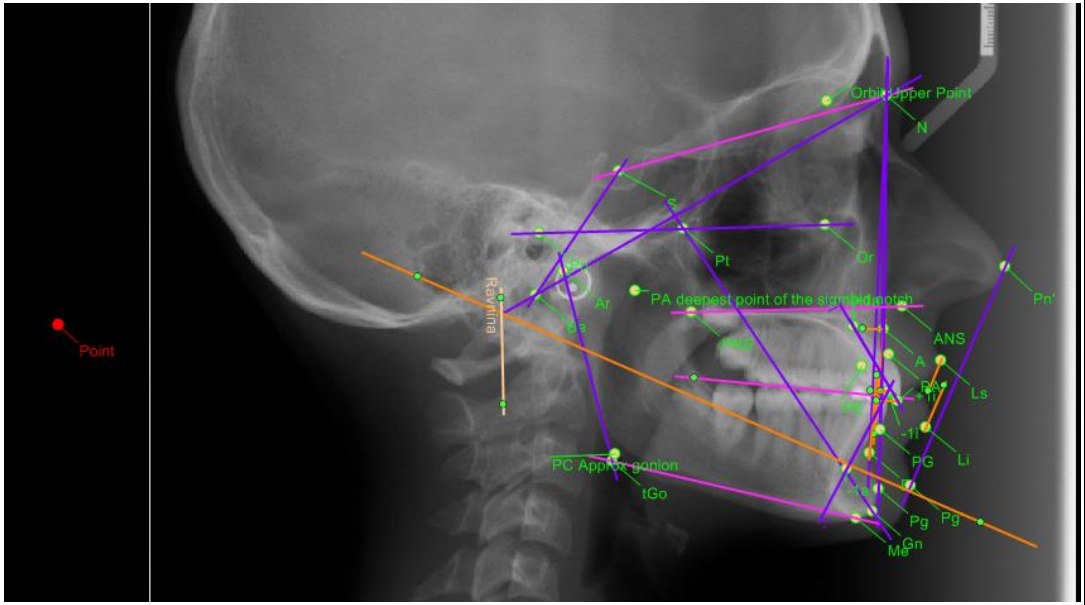
New Patient From Existing Analysis, mBoxes			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **mBox** tool from Design tab on the ribbon.  Pick near N (Nasion) point and doubleclick on the mBox. Doubleclickt SNA, SNB and ANB from **mBox Settings** dialogbox. Change font size to 14. Press **OK** button. Double-click on mBox again. Add tick at **Show measurement tag** . Press **OK** button. Right click on the MBox. Select **Align mBox** from the context menu. Select N (Nasion) point and press **OK** in **Linking mBox dialog**. Pick mBox. Move it to the desired location. Grab point N and move it around. MBox moves with a point.	If I want to show some measurement directly on the screen Ian always add an mBox with measurements of interest. Measurements are colored according to the deviation from mean standard value. Colors can be set according to users wishes, both for on screen mBoxes or printed ones. In mBoxes we can change font properties, such as size, font type.  We can also add measurements tag and display measurement name. mBox can be attached to the point, so that measurements are always close to where they should be. You can note how colors of measurements change, when the point is moved.	
Additional tips – Wiggle chart			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**

New Patient From Existing Analysis, mBoxes			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **Wiggle chart** tool from Design tab on the ribbon.  Pick somewhere on the left side of the canvas. (!!!! NOTE If measurements do not appear, you probably did not select Patient type in Patient/Type dialog box.) Grab point N and move it. Chart changes in real time. Right click on wiggle chart and select **Export Wiggle chart**. Open Power point and drag file to the slide. Select **mBox** and Infobox Wiggle chart option .	Wiggle chart is additional graphical representation of all measurements.  Measurements are displayed in real time and they change with movement of a certain point. They can be exported in vector format and put into PowerPoint, Word etc. Export color can be defined as well. This is very convenient presentation feature. Wiggle charts can be added to mBox as well. 	**Show this at the end of the demo as a candy.**

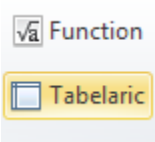
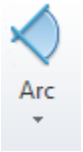
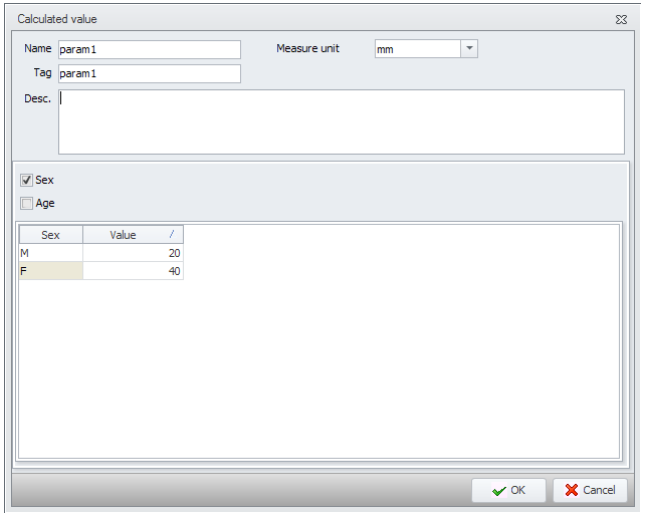
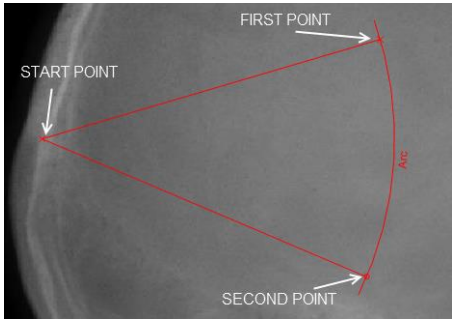
Additional tips – Storing the calibration			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	In **File → Configure** check the Automatic analysis calibration (☑ Automatic analysis calibration) Select **Calibration** tool from Analysis tab on the ribbon. Pick two points on ruler and enter distance between them. Press **OK** button. Icon for Calibration turns green.  Click it again and press **Save** button. Enter Name to the Add new calibration preset. Press OK button.	Every digital X-RAY machine type has different magnification and outputs different size of radiograph (in pixels). We can identify the machine based on pixel image size. And the same machine always has the same magnification. If we perform calibration of the image once, it will be the same forever. System checks the size of the imported radiograph and calibrates the analysis according to stored calibration parameters.  This will save calibration settings for machine with 988x1098 pixels.	**Show this at the end of the demo as a candy.**

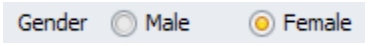
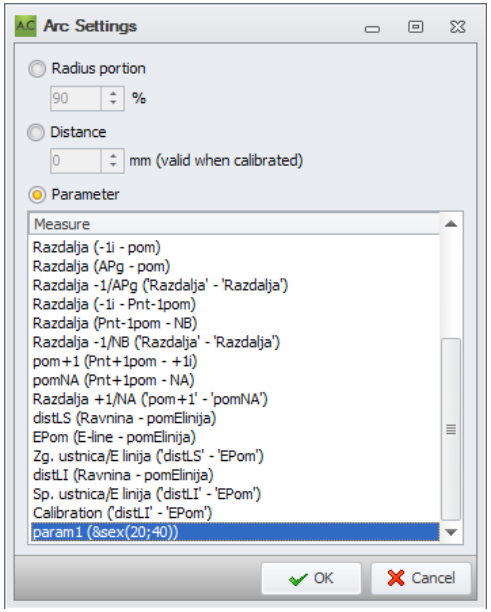
Additional tips – Storing the calibration			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Go to **File** tab in ribbon and select **Configure tool**. Select Image formats.	We can always check what calibrations are stored in AudaxCeph  In our case there are two formats stored. Whenever I import either of sizes that are in the calibration database, the radiographs are calibrated automatically. Of course I can always delete automatic calibration and do this step manually.	**Show this at the end of the demo as a candy.**

Additional tips - Convergence point

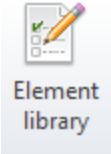
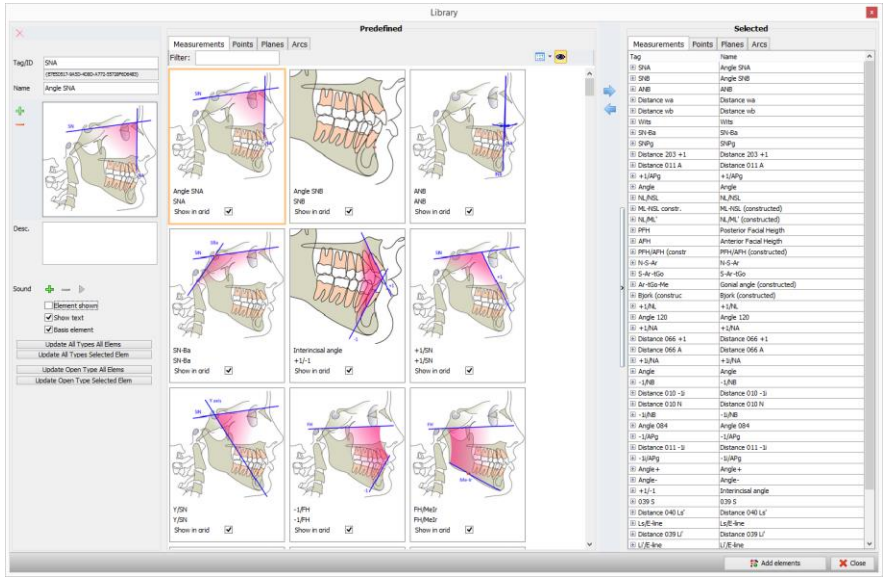
#	Picks	Technical Specialist Talk Track	Notes
	Use any of existing analyses (perhaps the last one opened (**BH.acx)** Show only Analysis layer. RMB on Analysis layer  Show all planes. Press show plane on Layers panel. Select **Convergence point** tool from a Point drop down.  Hold **<CTRL>** button and select planes SN, NL, Occlusion plane, ML.	In some analyses like Sassouni there is so called convergence point of planes needed. Planes do not intersect in the same point and convergence point needs to be calculated. There are two options: Convergence point according to Sassouni (O-point) and convergence point according jo Yosh Jefferson (T-point). They are slightly different but not much.  A convergence point is created on a place where minimum distance from all planes is calculated (Sassouni) or minimum vertical distance from all planes is calculated (Jefferson). We can provide an exact algorithm if requested.	**Show this at the end of the demo if they use Sassouni or Jefferson analysis types.**

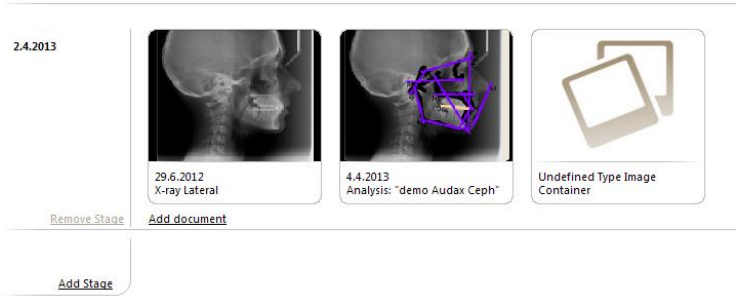
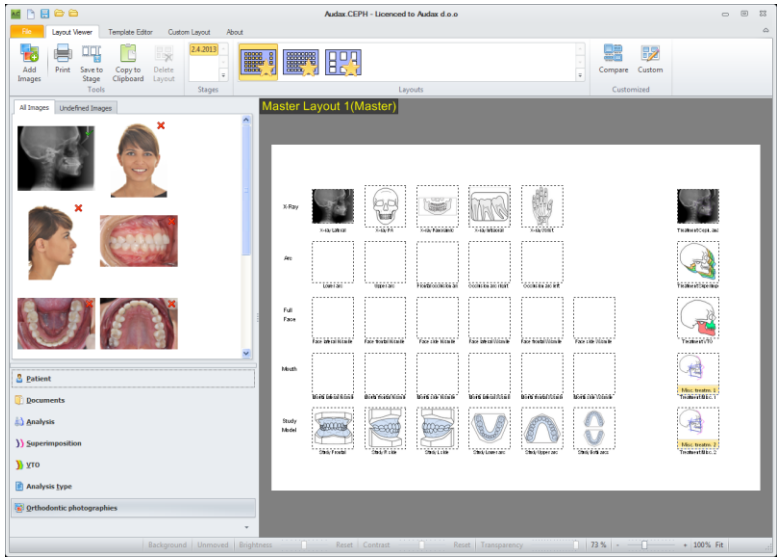
Additional tips - Parameters

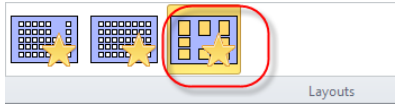
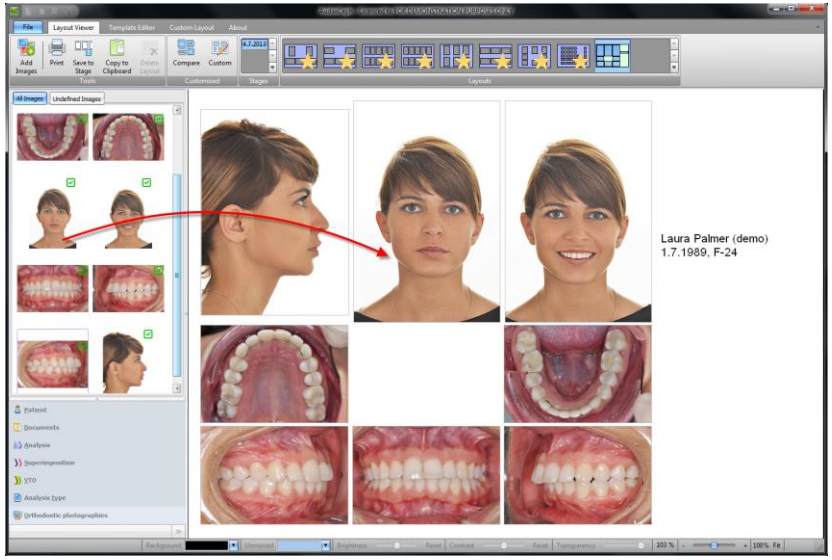
#	Picks	Technical Specialist Talk Track	Notes
	Select **Parameter** tool from Design tab..  Sex is already selected. Enter 20 for male (M). Enter 40 for female (F). Enter **param1** as a name. Press OK. Select **Arc** tool from the ribbon.  Pick a center point somewhere on canvas, Pick first point of the arc Pick second point of the arc.	In some cases we would like to drive certain dimensions with a parameter which depends on sex, age or both. We can define a parameter in form of a table. Let us just select sex as a independent parameter and enter 20 for male and 40 for female.  I would like to drive a dimension with the parameter which depends on patient sex. I will create two arcs and drive the difference in radius between them. 	**Show this at the end of the demo as a candy.**

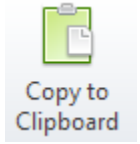
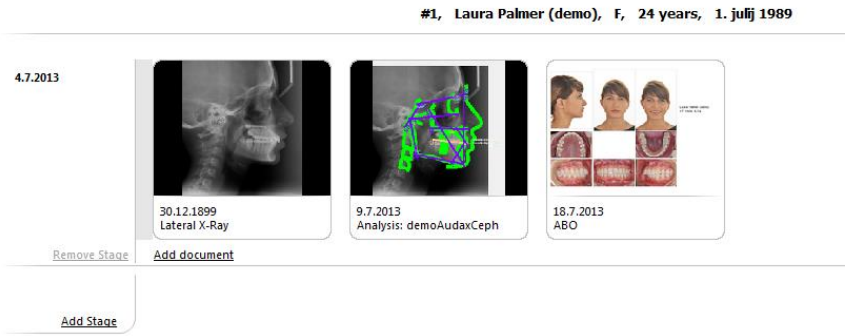
Additional tips - Parameters			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **Concentric arc** tool from Arc tool drop down menu. Pick already created arc. Double-click on a new arc. Select **param1** from the bottom of the list. Press **OK** button. Switch Gender from M to F or back (in Patient/Type panel)  in order to show the difference.	I can specify the difference in radius by double-clicking on the second arc. A dialog offers several options one being a parameter. When selecting the param1 from the list it will define the radius difference.  We can see that a concentric arc radius changes depending on the gender of a patient.	

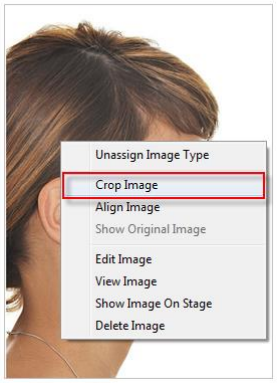
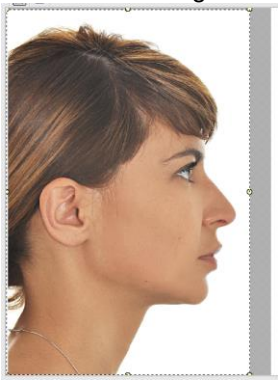
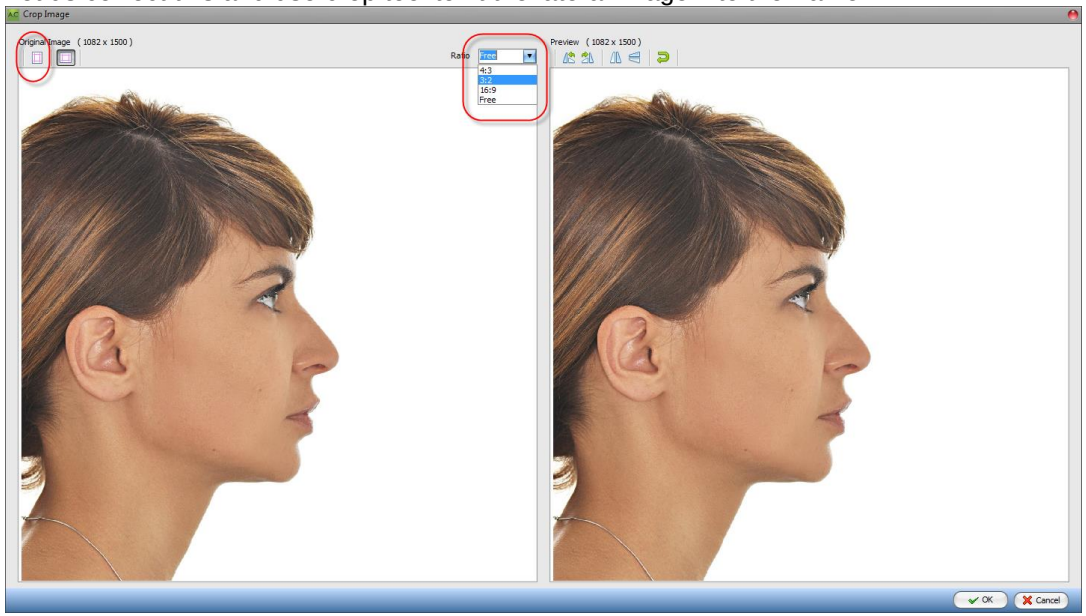
Additional tips - Excel export			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **Excel** tool from Arc tool drop down menu. 	We can create reports directly from AudaxCeph software, but it is also possible to export results and images to Excel spread sheet. A template can be incorporated into analysis type and used so that the report can be really fancy. I am just going to show you an example of results export of the analysis on the screen. The template in our case was embedded into analysis type, which was used to create the analysis. There are three default sheets: .) P for patient .) I for Images .) M for measurements Out of these sheets the fourth sheet is created. Virtually any kind of report can be created even the ones with floating norms.	**Show this at the end of the demo as a candy.** **You may use Tollaro analysis and show the floating norms export.**

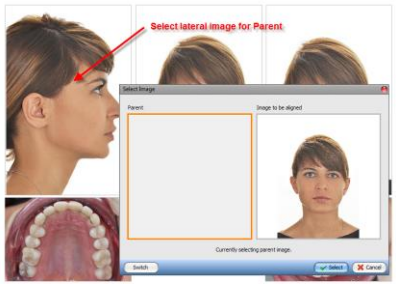
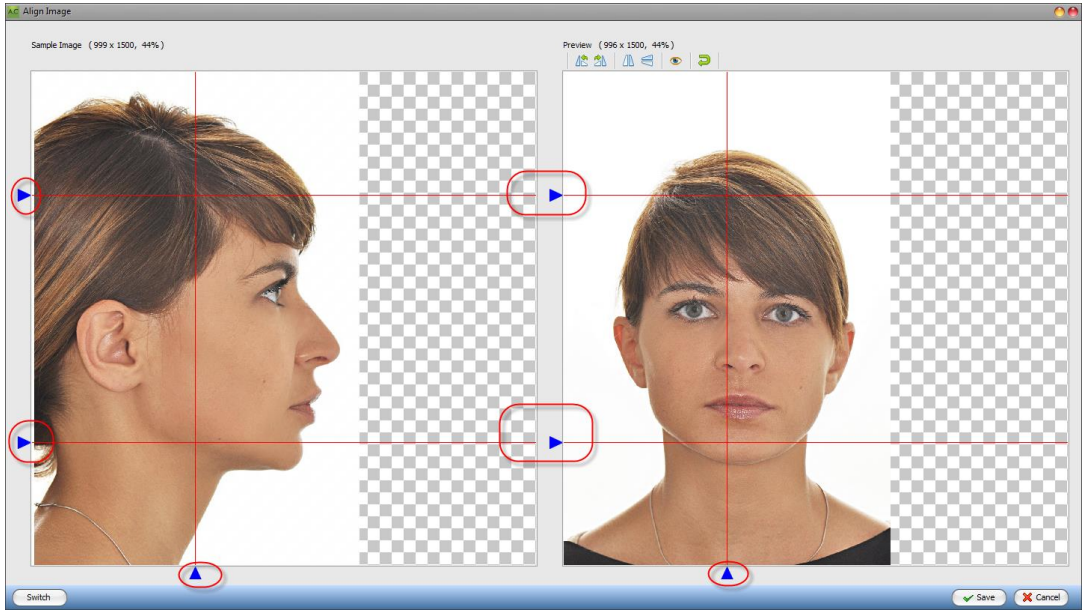
Additional tips - Analysis type creation from predefined elements			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **Analysis type** on Navigation bar . Select **New** tool on the **Analysis type** ribbon. Enter any name for the analysis type for example a name connected to the town of demo. Select **Element library** tool on the **Design** ribbon.  Double-click on ANB so that SNA, SNB and ANB are put into Selected area. Click on Points and Planes to show tnat parents were transferred as well. Double-click on Wits to add wits measurement. Click **Add elements** button.	It is a lot of work if we start creating an analysis type from scratch. We have to name elements, add properties, description, and thumbnail. It is nice to have a functionality where we would only choose measurements and add them to the analysis type. There is a database of measurements together with points and planes. We will add elements from the database, which already have their parent geometry and properties. When we chose angle ANB then also SNA and SNB are chosen and all the points and planes as well.  We will add one more measurement: WITS and finish our geometry and measurement definition. This is much faster and easier way for starting a new analysis type than doing it from scratch.	**Show this at the end of the demo as a candy.**

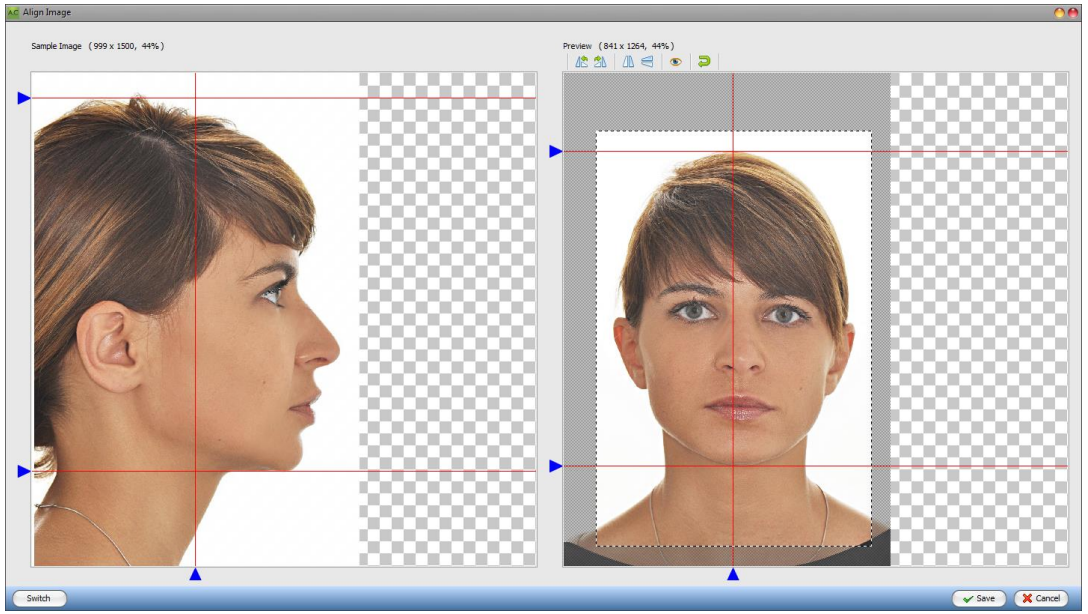
Orthodontic images			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Choose **Patient** from the **Navigation bar**. Select Laura Palmer who was entered at the beginning of this demo Double click on Undefined Type Image container.	At the beginning of the demo we entered a patient Laura and added some orthodontic images to the document holder of her initial stage. AudaxCeph has an intelligent way of using image properties to arrange images in layouts, compare images from different stages of the treatment and even create customized images layouts.  When we enter the orthodontic images environment we can see that some of the layouts are already defined. 	

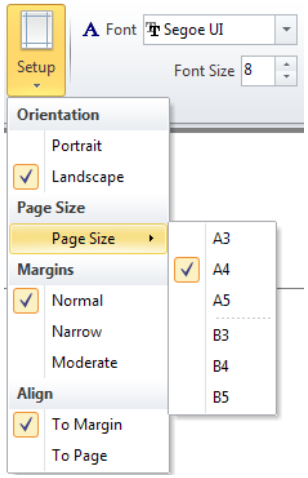
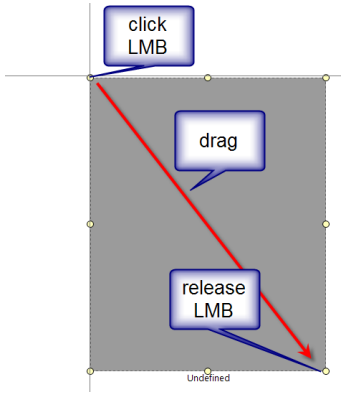
Orthodontic images			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Choose ABO layout  For better navigation we can choose between two containers with different filters: all images and undefined type images. Drag & drop images from the left side image container to the paper canvas, so that you get the canvas as on the picture. Switch between layouts. Finish at ABO.	The intention at this point is that all the images are given a property called “image type”, i.e. lateral x-ray, PA x-ray, different types of orthodontic photography (emma, smile, no smile…). Once the image is assigned a “type” it will appear on all layouts, where defined/placed, automatically. We can see that two images have already been put in place: (a) X-ray lateral and (b) analysis network. I will choose ABO layout from the container and drag images to the paper.  When an image is put in place its type is assigned to it and image in the container gets a tick, so that we know exactly which images have already been used. If I switch to any of other two layouts, images are put in place too. We can do different things now.	

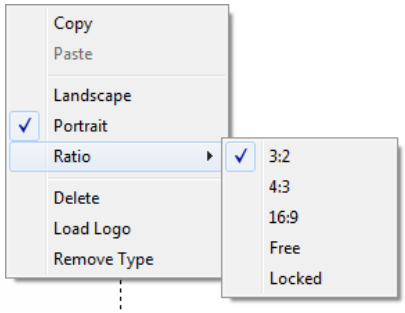
Orthodontic images			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Press **Copy to Clipboard** button  Alt-TAB to MS WORD and paste layout to a new document.	It may be useful to paste the images layout to another document. I may create a high resolution copy to the clipboard and paste it to a presentation for a colleague.	
	Press **Save to Stage** button. Switch to **Documents** in the Navigation bar.	I can put this sheet on the document holder so that it is a part of the collection of documents.  	
	Double click the layout ABO.	Because all the images are assigned a type, the undefined images container is no longer present on the stage. Opening a layout from the document container brings us back to layout environment again.	

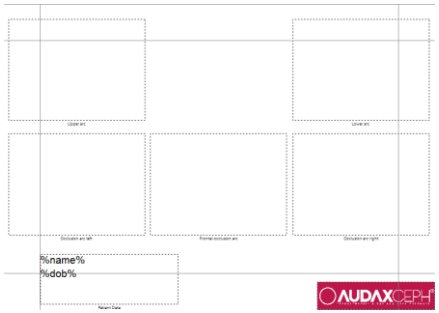
Orthodontic images			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Right click on the lateral image. Use **Crop Image** option  Pick upper left corner and drag frame to lower right corner  If needed grab corners or move frame to adjust the image	We can quickly notice, that lateral no-smile image is bigger than the frontal ones. Because the layout frames are drawn in 3:2 ratio and the lateral image is not exactly this ratio, its frame appears smaller. Let us correct this and use crop tool to fit the lateral image into the frame.  Use 3:2 ratio and portrait orientation. Draw a frame by selecting upper left and lower right corner of the left image. The 3:2 ratio is maintained. Adjust the frame by moving and resizing it. When finished accept the result by confirming it on OK button. You can see that image now fits exactly into 3:2 frame.	

Orthodontic images			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Rightclick on frontal image and select **Align Image** option.  	We need to align frontal images so that they are in line with the lateral one. I will align frontal image to the lateral one. The action is to be done on the image which is to be aligned to another image. I use context menu and get a dialogwhere Parent image is missing. So I select the lateral one and confirm what I've chosen. An alignment dialog opens and simply drag lines so that they match certain significant landmarks on both images.  	

Orthodontic images			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Drag lower horizontal line by selecting lower blue triangle to the chin on both images respectively. Drag upper horizontal line by selecting upper blue triangle to the top of the head on both images respectively. Press **Save** button.	I will lower the bottom horizontal to chin on both images and upper horizontal to the top of the head.  We can notice that only a portion of the right image is to be displayed and that of course it has an aspect ratio the same as the parent (left) one. When confirmed images are aligned. We can do this again with frontal smiling image. 	

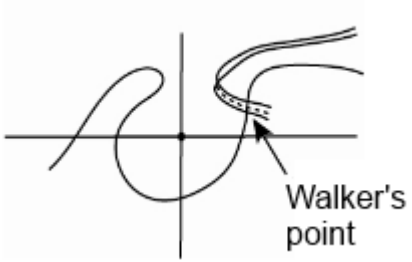
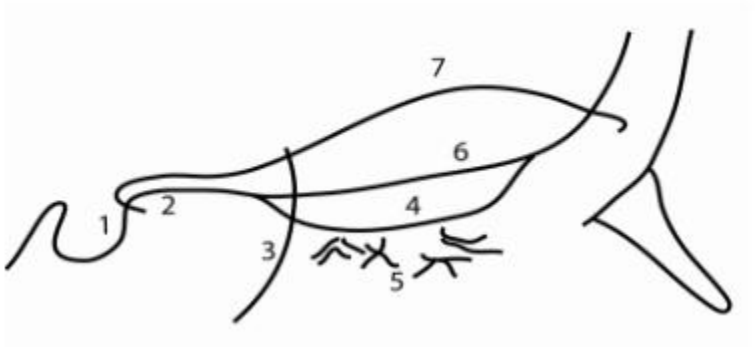
Orthodontic images			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Switch to **Template Editor** Tab. Show page setup options.  Click to Add image icon and draw a frame from upper and left margin.  Select frame (becomes gray) Copy to clipboard Paste from clipboard 4 times.	Layouts can be predefined (industry set), global (the same for all patients), custom (made only for one patient) and comparative (made for one patient and comparing the same type of images from different stages of treatment). Just for the illustration we will quickly create a layout for intraoral arc images. We can specify several properties like size, orientation font for annotations,… Template icon is in green color and has no frames. When adding a frame it automatically appears on the icon as well. We can use Copy Paste functionality to create additional four frames	

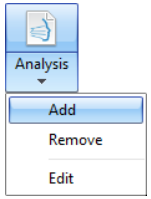
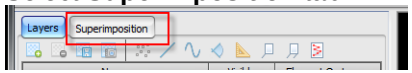
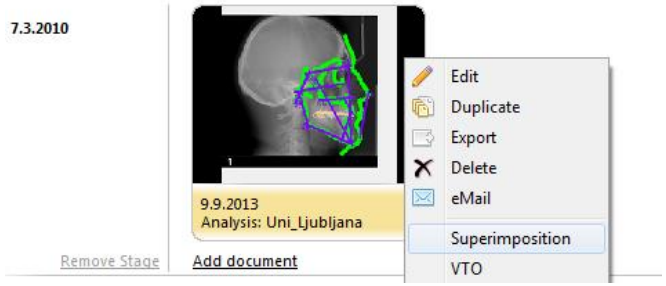
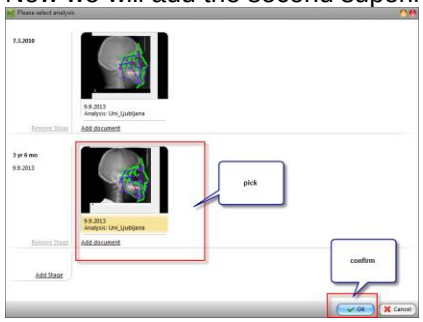
Orthodontic images			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Rightclick on the frame and select 3:2 ratio 	To specify the exact frame ratio an option Ratio from context menu can be used. This sets exact ratio. When resizing the frame with a ratio set, it will keep the aspect. The aspect ratio of a logo is always automatically maintained.	

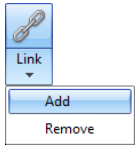
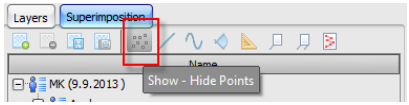
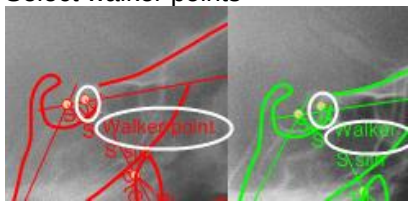
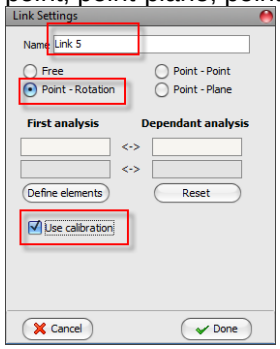
Orthodontic images			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Use tools to align frames like on the image. Deselect all frames by clicking on canvas outside frames. Pick upper left and click on upper arc upper right -> lower arc lower left -> occlusion left lower middle -> frontal occlusion lower right -> occlusion right Save layout Switch to Layout viewer tab and select DEMO layout	Using alignment tools we can align one image to another Icon is created automatically. We will assign a type of the image to be placed in a certain frame. When all frames are assigned a type we can save the layout or upgrade it with additional information like Patient name, clinic logo, we can add some text.  I will choose name **DEMO**. And return to viewer and check the layout. With each patient this layout will be the same. We only need to create it once and then reuse it several times.	**Logo file (logo.png) is a part of a demo toolkit.** **Patient font size is 21.**

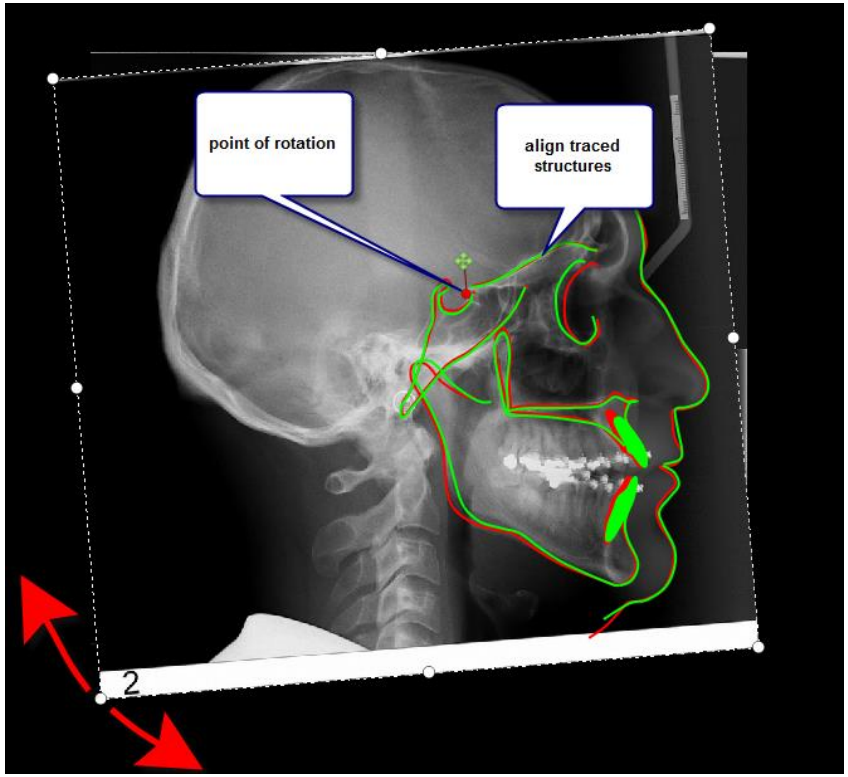
Orthodontic images			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Press **Save to Stage** button. Switch to **Documents** in the Navigation bar to show documents.	 I want this image on document holder. In this way I can automate the report generation. I am able to create quick presentations to the patient or colleagues and at the same time all the patient data is sorted and organized.	

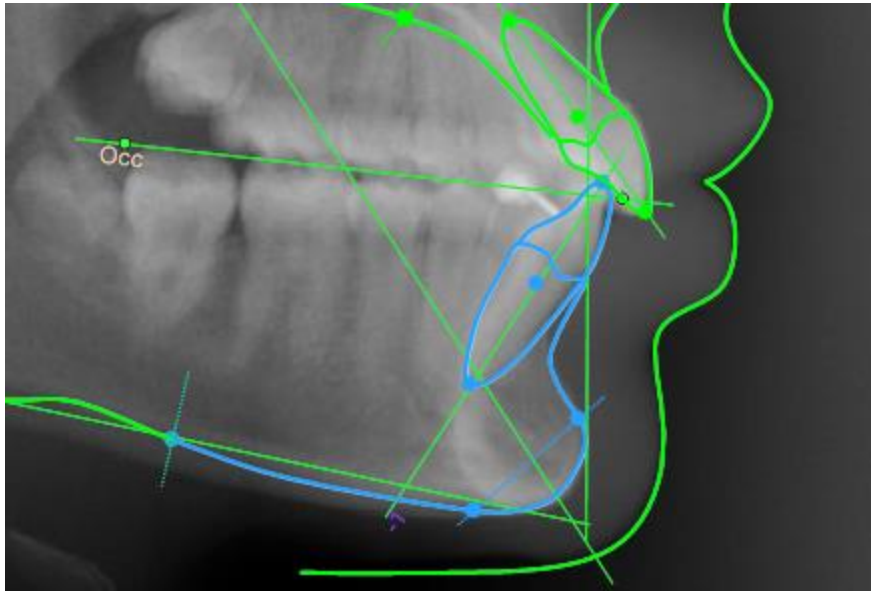
Additional tips – Structural superimposition			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**

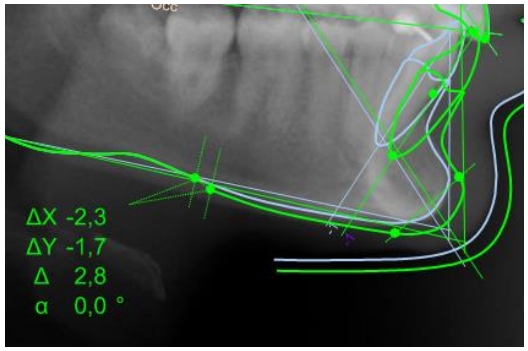
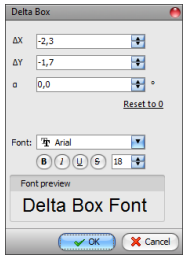
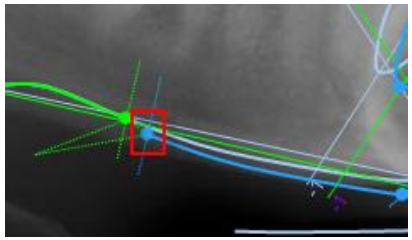
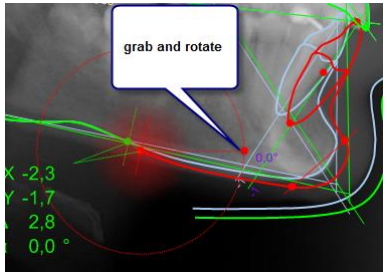
		To create a structural superimposition, some things should be done in advance:
		• stable tissue structures must be traced before for example
		  • Walker point and the cranial base
		  • …
		• both analyses <u>must</u> be calibrated in advance
		 
		
		Then we will add some silhouettes to trace hard tissue contours.
		 
		
			1) The inner contour of the anterior wall of sella turcica.
			2) The mean intersection point of the lower contours of the anterior clinoid processes and the contour of the anterior wall of sella, Walkers´s point.
			3) The anterior contours of the middle cranial fossae.
			4) The contour of the cribriform plate
			5) Details in the trabecular system in the anterior cranial base.
			6) The contours of the bilateral fronto-ethmoidal crests.
			7) The cerebral surfaces of the orbital roofs

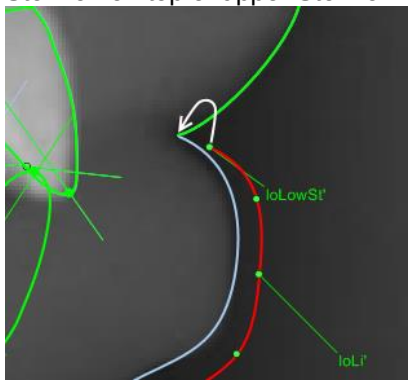
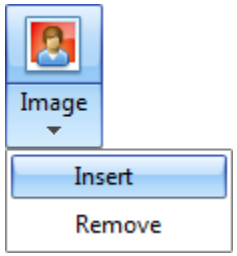
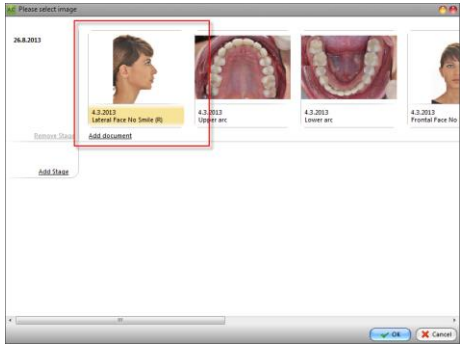
Additional tips – Structural superimposition			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	RMB click on the analysis on the first stage and select **Superimposition**. Select **Add** tool from **Analysis tool** in the Ribbon.  Select **second analysis** and push **OK** button. Select **Superimposition** tab.  Click on S-N in link tree. Click on ANS-NL @ANS in link tree.	Let us create a new patient named Mark Kedoe (or whatever) and create two stages: the firs of 7.3.2010 and the second of TODAY. I have two analyses already prepared and will drop them into the stage. They are in demo toolkit (MK_1_1_2007_1.acx and MK_1_1_2009_1.acx) We open the analysis on the first stage in Superimposition mode.  Now we will add the second superimposition.  Some links are created automatically due to predefined superimposition definition, which is really nice. You can see them in the assembly tree: for example Sella Nasion or ANS NL @ANS.	**Both analyses have the Walker point and cerebral surfaces of the orbital roofs already traced.**

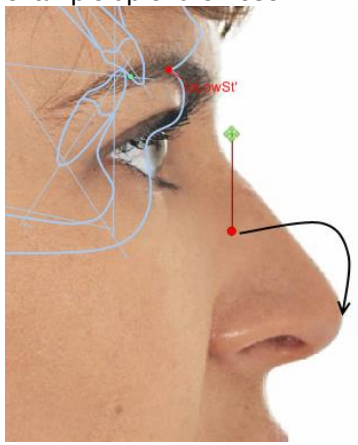
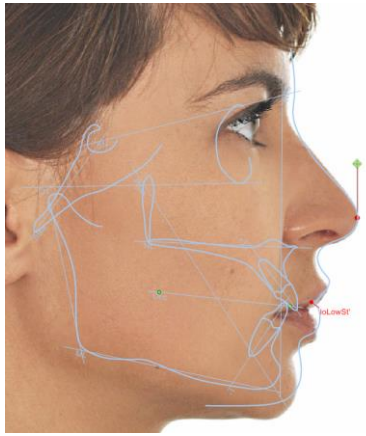
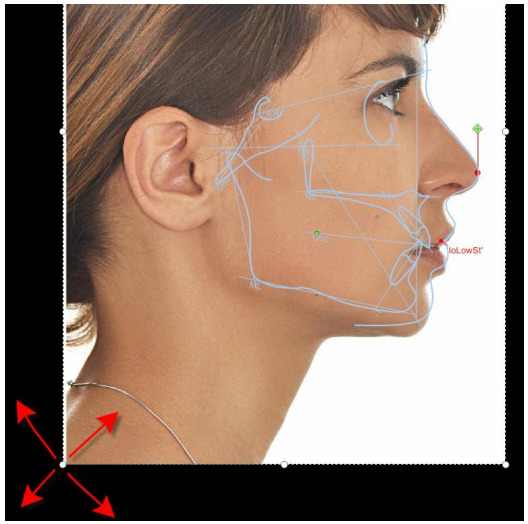
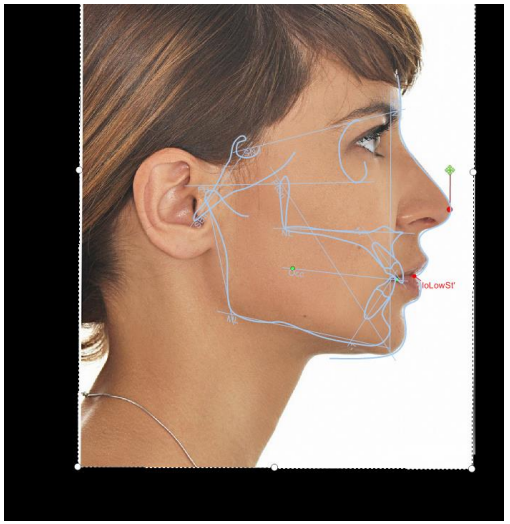
Additional tips – Structural superimposition			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select **Add** from **Link tool** in the Ribbon.  Enter name **Structural Sup**. Select **Point-Rotation** option. Place a tick in front of **Use calibration**. If Walker points are not visible push Point toggle view button (twice), so that all the points are visible.  Push Define elements button. Select walker points  Press **Assemble** button in the dialogue.	We will now add additional link between the two analyses. Several options appear which enable user to do any kind of superimposition, either point to point, point-plane, point-rotation.  I choose a name for example Structural Sup. We are actually going to align both Walker points and align the traced structures by rotating the second analysis about Walker point. To prevent analysis from resizing we need to Use calibration to match probably different sizes of images in both analyses. After the ticked Use Calibration option, the rotation will be the only possible movement We will now select elements (Walker points on each analysis respectively). We confirm the alignment and put one analysis on the top of the other.	

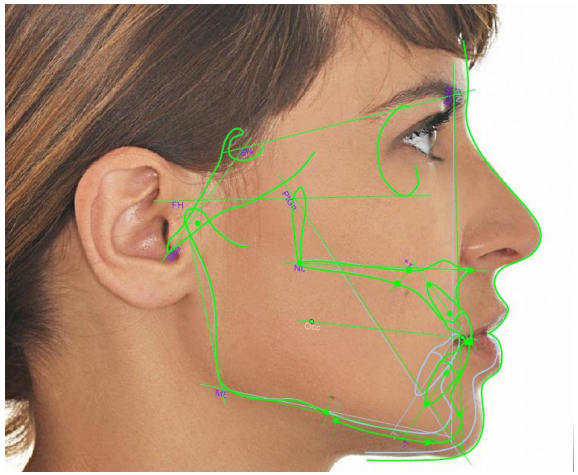
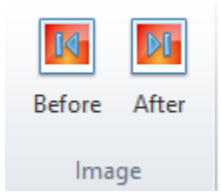
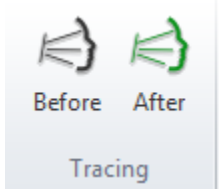
Additional tips – Structural superimposition			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Grab the corner of the second analysis and rotate it about aligned points. Press **Done** in the dialogue box.	What we need to do is just to grab a corner of the second analysis and visually align cerebral surfaces of the orbital roofs. After we are done, we can check all the links just by clicking on each one.  	

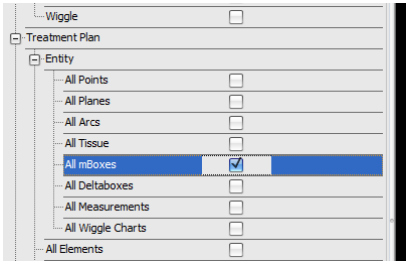
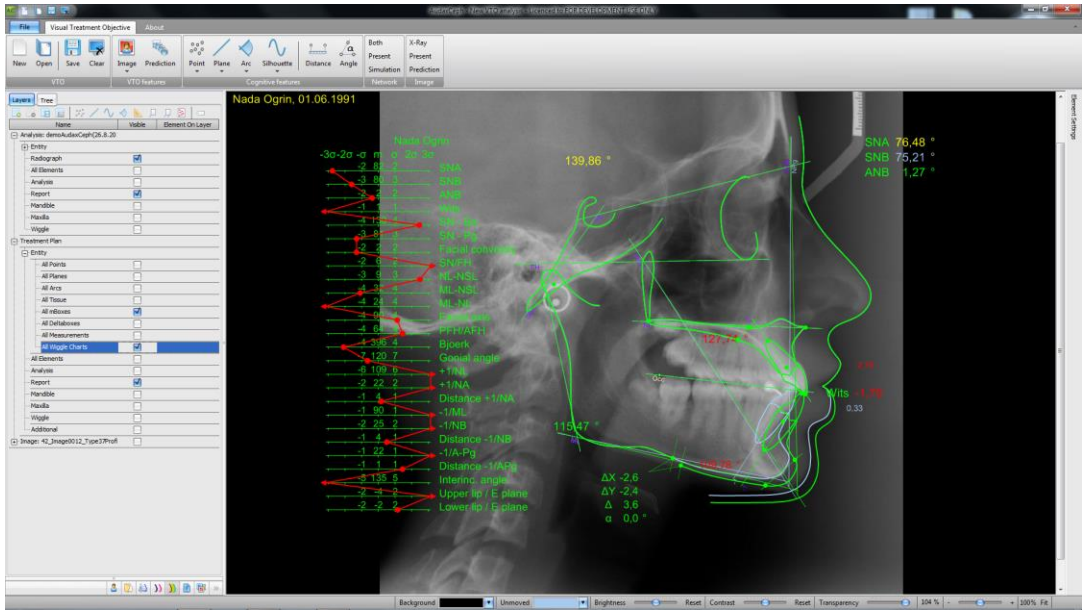
Additional tips – VTO			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	RMB click on the analysis on the stage and select **VTO**.	To create an orthodontic and/or surgical si,ulation and treatment prediction we start from an analysis. We will use Laura Palmer (or other name of the patient we started with), because her analysis has already been created.	
	Move mouse over mandible, chin, Lower incisor.	We are put into VTO environment. The canvas looks pretty much the same as in the analysis environment. By default we see some tissue and planes. If me move a mouse across the tissue it highlights in cyan, but not just element by element. Entire group consisting from several elements highlights. 	
	Select the highlighted part with a mouse click and move around a little	If we move the tissue, two analyses are visible: the initial one which is in gray and can not be moved and the green which is an exact copy of the initial one before any movement is done. Whe we move the tissue a deltabox automatically appears. It measures the relative distance of moved tissue versus the static tissue.	

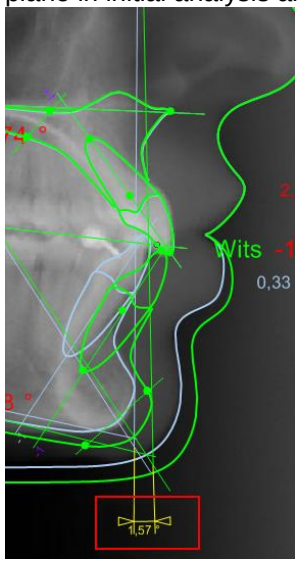
Additional tips – VTO			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Pick a deltabox and move it toanother location.	We can grab a deltabox and move it to a better position if necessary. 	
	Doubleclick to deltabox  Play with X,Y and alpha values. Confirm by pressing **OK** button.	To finetune the movement we can doubleclick to deltabox. A dialogue oprens and offers manual change to X and Y distance + rotation. There is also a reset (Reset to 0) option which brings the tissut to its origo. We can also change some settings for each deltabox including size, font. I will do some minor changes up to +- 2 mm and rotation +- few degrees.	
	Pick (RMB) a point at the left end of the Mandible body and select Rotate. 	Rotation can be done manually. By selecting Rotate from the RMB context menu a rotation mannequin appears. We can rotate the tissue by steering the wheel.  Also incisors or chin can be moved and movements can be done on maxilla as well.	

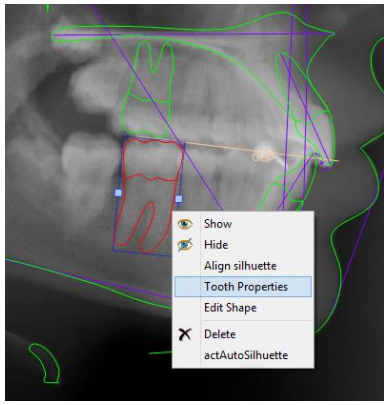
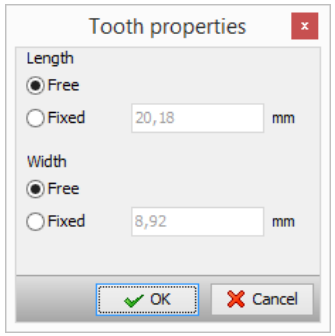
Additional tips – VTO			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Zoom to lip area. Notice the gap between the two lips. Click on the lower lip and points defining its shape appear. Move low Stomion on top of upper Stomion  	We can notice that there has been a change in soft tissue profile as well. Depending on the surgery technique, tissue rigidity, scale of the surgery and other, it is hard to predict exact changes. But the system will offer the prediction according to the treatment. It is great to be able to manipulate the expected change interactively. We can freely move other points as well as intermediate points (the ones with no name tag), delete or add them until we feel that our result is on the screen.	
	Select **Insert** from **Image tool** in the Ribbon.  	If a profile image of the patient is available it can be assembled any time, but there is no need to do it if you do not want to obtain a prediction of the image profile after the treatment. We have the profile image so we will overlay it in a matter of seconds. Images are put to its stage and we choose a lateral profile image. 	***of the record:*** **Assembly of an image slightly differs from the one in superimposition. We will in the future change it to the one in VTO.**

Additional tips – VTO			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Select an image and press **OK** button. Select a lolipop and move iz to the tip of the nose Grab the image anywhere and align both tip of the nose one on top of the other. Now grab the corner of the image and adjust image and tracing. (use mouse wheel to resize canvas) Press **Image** button on canvas again to finish the process of insertion.	Image is put on canvas. But it is does not fit. It is too big and it is not rotated properly. A red dot in a lolipop is a center of rotation. We will put it on a prominent easy to trace point for example tip of the nose.    	

Additional tips – VTO			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Press Prediction tool in the ribbon. 	When we are satisfied we can do the calculation of the predicted profile. 	
	Push **Present**  Push Prediction Push Simulation 	Some predefined view states are available. There are four state toggle buttons in the ribbon for analysis networks and images. If I push **Before (Image)** button, unmodified image will appear and the view state of network will not change. If I push **After (Image)** button, predicted image will appear. If I want to have after treatment tracing I push **After (Network)** button. By playing with view states I can generate several predefined ways of displaying the treatment plan.	

Additional tips – VTO			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Press **Both** and **Xray** Go to Layers tree Open Treatment plan Open Entity Check All mBoxes  	We can always add some additonal measurements to our plan, switch on measurement boxes, show wiggle chart. There is the same structure of layers in analysis and its copy which is actually a treatment plan. It means that if I switch on a certain layer from the treatment plan, elements will appear. If I want to have all mBoxes visible, I switch on mBox layer in Treatment plan tree. mBoxes appear. If I move tissue, the numbers will change in real time reflecting after treatment situation. If I switch on All Wiggle Charts layer, it will appear and reflect changes in geometry.  The same is true for additional measurements, which enable me to do a detailed treatment plan.	

Additional tips – VTO			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Press **Angle** tool in the ribbon. Select gray NB and green NB	Measurements can be done between any compatible entities for example between NB plane in initial analysis and NB in Treatment plan or inside a treatment plan itself.  If we move tissue, the measurement of the angle will change. We can also make a distance from point to point or to plane measurement, add some geometry elements and play with other options. Any number of predictions can be generated from an existing analysis.	

Additional tips – Teeth properties			
#	**Picks**	**Technical Specialist Talk Track**	**Notes**
	Rightclick on the tooth silhouette. Select **Tooth Properties**. Select fixed options and enter both values for length (25 mm) and width (10 mm). Press OK button	Teeth can be given some size properties: Length and Width. The property dialogue is shown by pressing LMB on tooth silhouette and selecting Properties option.   If values are enter for example 25 and 10 mm, the size of a tooth changes.	**!!!! PLEASE NOTE** **Analysis MUST be calibrated in order to be able to define tooth size.**