



Vlaanderen
is landbouw & visserij

USER MANUAL

smartdots

User interface

ILVO

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and Fisheries Research

www.ilvo.vlaanderen.be

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Inhoudstafel

- 1. Introduction..... 4
- 2. Screen 1: Authentication 5
- 3. Screen 2: Activities 6
- 4. Screen 3: Age reading 7
 - 4.1. Main window 8
 - 4.2. Files panel..... 9
 - 4.3. Adjustments panel 9
 - 4.4. Annotations panel 10
 - 4.5. Sample panel.....11
 - 4.6. Graphs panel12
 - 4.7. Editor13
 - 4.8. Application bar14

1. Introduction

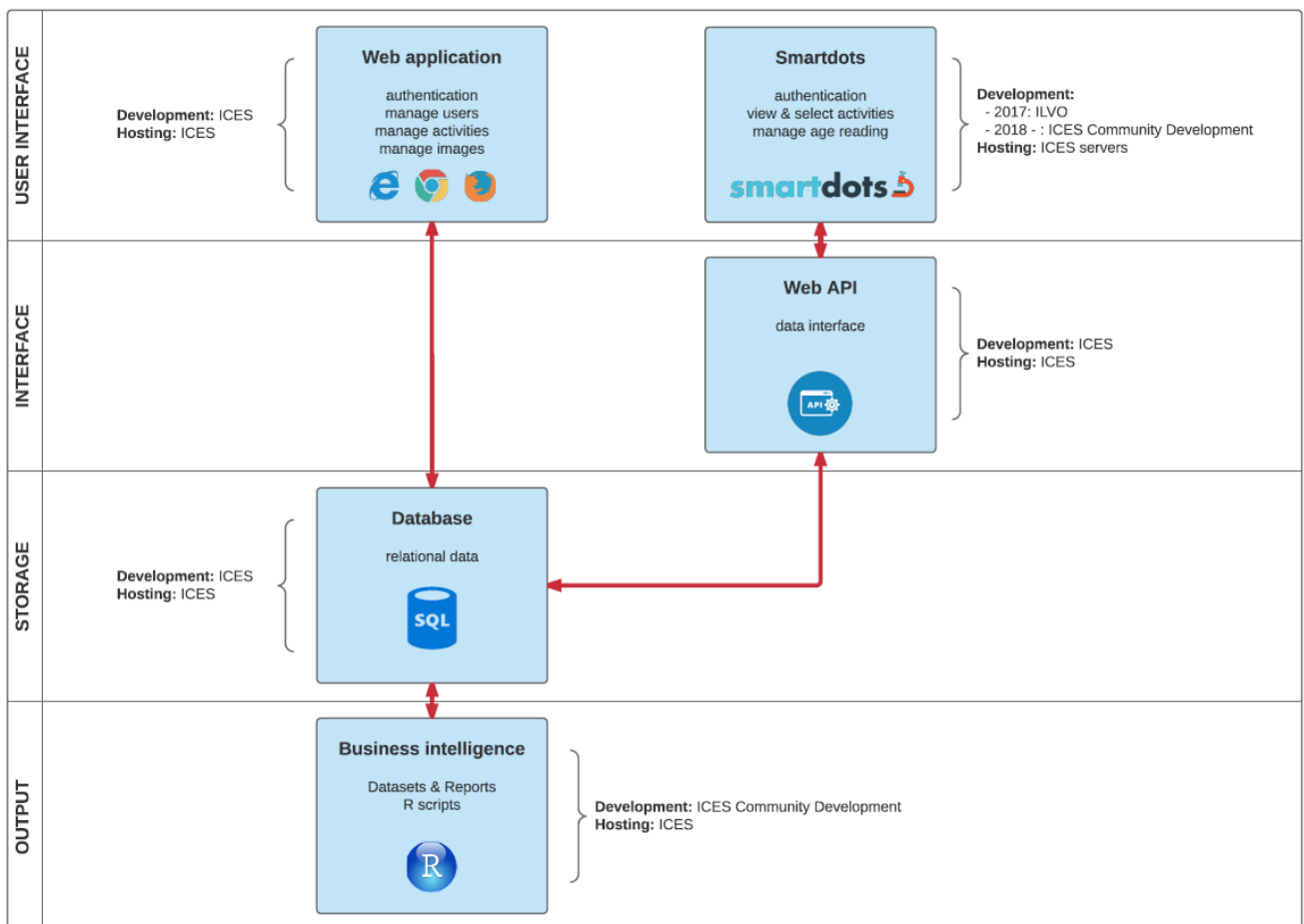
Smartdots is a software application for performing age determination analysis of fish.

To determine the age of the fish end-users make annotations on otolith images. Each annotation contains a line and one or multiple dots. The number of dots is equal to the age. In addition an annotation can contain a parameter, a quality indication and some comment.

The Smartdots user interface exists out of 3 main screens:

- Screen 1: Authentication
- Screen 2: Analyses
- Screen 3: Age reading

Smartdots is developed as a client-server application. Smartdots (the client) is a Windows-based application (Windows Presentation Foundation). Smartdots exchange messages with a Web API (the server) in a request-response messaging pattern. The Web API accesses the database.

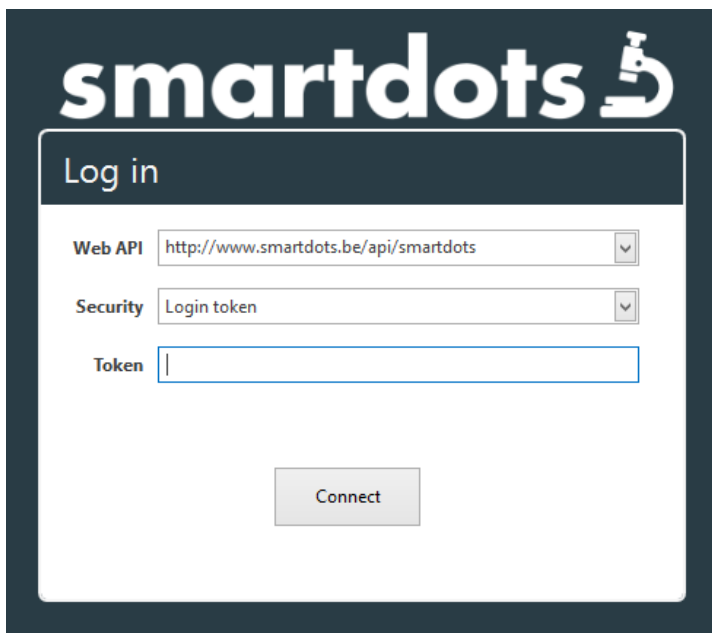


2. Screen 1: Authentication

In the Authentication window the user enters credentials to login in Smartdots. A successful login will bring the user to the next screen. There are currently 3 ways of authentication.

- **Windows Authentication:** login with the logged in windows user account
- **Login token:** Enter a token you received from the administrator
- **Basic Authentication:** Enter a username and password to login

The available authentication methods depends on the Web API.

The image shows a 'Log in' window for 'smartdots'. The window has a dark blue header with the 'smartdots' logo. Below the header, there are three dropdown menus: 'Web API' with the value 'http://www.smartdots.be/api/smartdots', 'Security' with the value 'Login token', and 'Token' which is currently empty. At the bottom of the window is a 'Connect' button.

smartdots

Log in

Web API

Security





Token

Connect

3. Screen 2: Activities

This window displays a list of activities (or events) available to the user. [The activity properties and rows shown in this window depend on the Web API.](#)

The user can doubleclick the Activity or select it and press Age reading to go to the next screen. The only condition is that a folder or path is linked to the Activity.

<div>  <div>Activities overview</div> <div>    </div> </div>											
Number	Service	Project	Project Type	Sample Set	Method	Sample State	Date Due	Labtechnician	Folder	Status	Count Sample
20170287	LF 235/249/304/...	IRIS	IRIS2	LF 304-305_2015	WHL	PHO	20/10/2017 14:2...	mmoerman		TODO	0 / 57
20170289	LF 235/249/304/...	IRIS	IRIS2	LF 316-317_2015	WHL	PHO	20/10/2017 14:2...	mmoerman		TODO	0 / 62
20170290	LF 235/249/304/...	IRIS	IRIS2	LF 340_2015	WHL	PHO	20/10/2017 14:2...	mmoerman		TODO	0 / 23
20170291	LF 235/249/304/...	IRIS	IRIS2	LF 376_2015	WHL	PHO	20/10/2017 14:2...	mmoerman		TODO	0 / 32
20170292	LF 235/249/304/...	IRIS	IRIS2	LF 378-379_2015	WHL	PHO	20/10/2017 14:2...	mmoerman		TODO	0 / 70
20170293	LF 235/249/304/...	IRIS	IRIS2	LF 383_2015	WHL	PHO	20/10/2017 14:2...	mmoerman		TODO	0 / 35
20170294	LF 235/249/304/...	IRIS	IRIS2	LF 384-385_2015	WHL	PHO	20/10/2017 14:2...	mmoerman		TODO	0 / 59
20170295	LF 235/249/304/...	IRIS	IRIS2	LF 391_2015	WHL	PHO	20/10/2017 14:2...	mmoerman		TODO	0 / 72
20170296	LF 235/249/304/...	IRIS	IRIS2	LF 464_2015	WHL	PHO	20/10/2017 14:2...	mmoerman		TODO	0 / 28
20170343	NDGP17_S_PTC...	NDGP	S	BLL_7D_D_S	S&S	PHO	8/01/2018 20:45...	mmoerman		WIP	0 / 10
20170345	NDGP17_S_PTC...	NDGP	S	COD_7D_L_M	S	PHO	8/01/2018 21:16...	mmoerman		WIP	0 / 3
20170347	NDGP17_S_PTC...	NDGP	S	DAB_7D_L_M	S&S	PHO	8/01/2018 21:18...	mmoerman		WIP	0 / 28
20170349	NDGP17_S_PTC...	NDGP	S	LEM_7D_D_S	WHL	PHO	8/01/2018 21:19...	mmoerman	\\clo.be\dfs\Da...	WIP	0 / 32
20170352	NDGP17_S_PTC...	NDGP	S	SOL_7D_R_S	S&S	PHO	8/01/2018 21:20...	mmoerman		WIP	0 / 31

1

2

3

4

Back

Age Reading

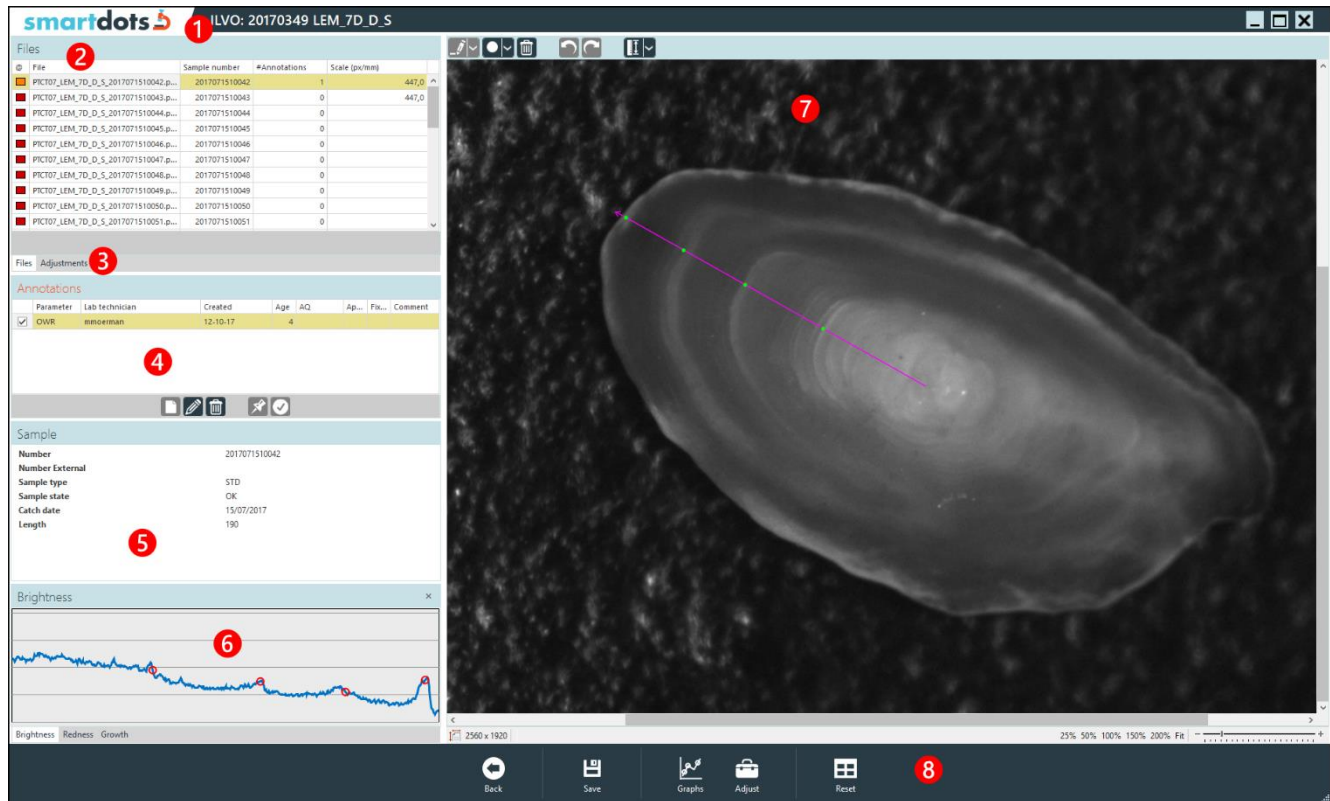
Edit Folder

Reload

- 1) Back button: Go back to the Login screen
- 2) Age Reading: Go to the next screen to start dotting (only possible if there's an active folder)
- 3) Edit Folder:
 - Allows the user to change the folder of the activity. Can only be changed to file system folders.
 - [This button is an optional setting controlled by Web API.](#)
- 4) Reload the Activities overview

4. Screen 3: Age reading

This screen is where the dotting happens. It provides several tools to help the age reader in the age reading process. All relevant information is saved through the Web API into a database.

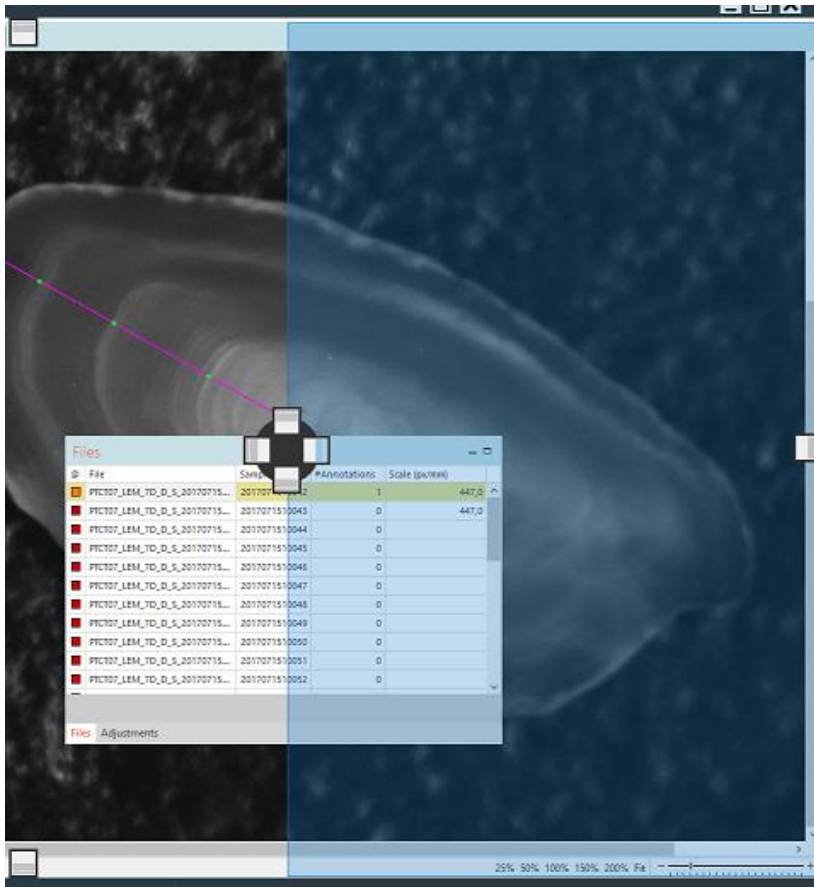


- 1) Main window
- 2) Files panel
- 3) Adjustments panel
- 4) Annotations panel
- 5) Sample panel
- 6) Graphs panel
- 7) Editor
- 8) Application bar

4.1. Main window

The Main window has a title bar which shows information of the activity the user is currently working on.

Except for the editor and the application bar, every other panel is **floatable and dockable** wherever the user wants it. Simply drag and drop panels to the desired location. Panels can be dragged outside of the mainwindow and even be put on another screen.



4.2. Files panel

This panel shows all the files for the selected activity and more info about them.

1	2	3	4	5	
@	File	Sample number	#Annotations	Scale (px/mm)	
	PTCT07_LEM_7D_D_S_20170715...	2017071510042	1	447,0	^
	PTCT07_LEM_7D_D_S_20170715...	2017071510043	0	447,0	
	PTCT07_LEM_7D_D_S_20170715...	2017071510044	0		
	PTCT07_LEM_7D_D_S_20170715...	2017071510045	0		
	PTCT07_LEM_7D_D_S_20170715...	2017071510046	0		
	PTCT07_LEM_7D_D_S_20170715...	2017071510047	0		
	PTCT07_LEM_7D_D_S_20170715...	2017071510048	0		
	PTCT07_LEM_7D_D_S_20170715...	2017071510049	0		
	PTCT07_LEM_7D_D_S_20170715...	2017071510050	0		
	PTCT07_LEM_7D_D_S_20170715...	2017071510051	0		
	PTCT07_LEM_7D_D_S_20170715...	2017071510052	0		
	PTCT07_LEM_7D_D_S_20170715...	2017071510053	0		

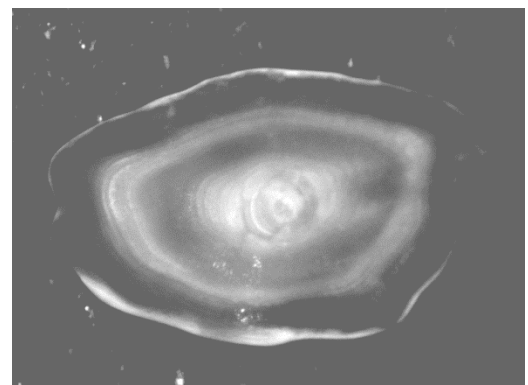
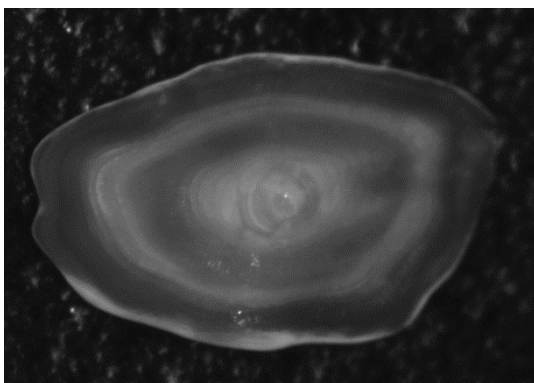
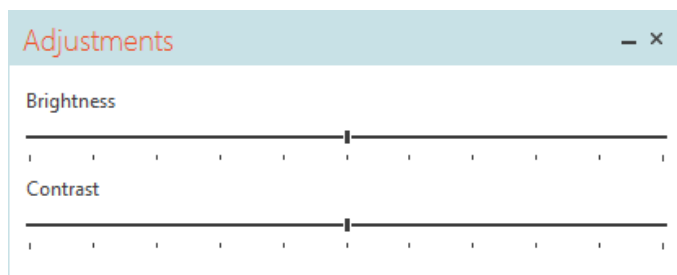
6

- 1) Shows the **status** of the sample. This column is an optional setting controlled by Web API.
- 2) The **Filename**
- 3) The **number of the Sample** that is linked to the file.
- 4) The **number of annotations** made on the file
- 5) The **scale** of the file in pixels per millimeter
- 6) Button to **attach or detach** samples from a file. This button is an optional setting controlled by Web API.

9

4.3. Adjustments panel

This panel lets the user temporarily change the Brightness and contrast of the image. To change the brightness or contrast, simply move the slider to another value.



4.4. Annotations panel

Shows the annotations made on the selected file.

Which annotations will be shown is controlled by the Web API. These can either be all annotations by everyone or just the ones you made.

The screenshot shows the Annotations panel interface. At the top, there is a header bar with a search icon (1) and a filter icon (2). Below this is a table with columns: Parameter (3), Lab technician (4), Created (5), Age (6), AQ (7), Ap... (8), Fix... (9), and Comment (10). The table contains three rows of annotations. Below the table is a large empty box (11). At the bottom, there is a toolbar with icons for creating (12), editing (13), deleting (14), and approving/disapproving (15) annotations.

	Parameter	Lab technician	Created	Age	AQ	Ap...	Fix...	Comment
<input type="checkbox"/>	OWR	mmoerman	12-10-17	4				
<input type="checkbox"/>	OWR	mmoerman	12-10-17	5	AQ2			
<input type="checkbox"/>	OWR	mmoerman	12-10-17	4	AQ3			

- 1) **Selection box** which allows multiple annotations to be selected.
 - The selected annotations are shown on the image.
 - Multiple annotations can also be deleted in bulk.
- 2) The age reading **parameter** (method) linked to the annotation. The parameter can be edited if multiple options are available. [The visible parameters are controlled by the Web API.](#)
- 3) The **Lab technician** is the user who made the annotation.
- 4) Shows the **creation date** of the annotation.
- 5) Shows the **age** which is the count of number of dots made on the image.
- 6) The **annotation quality code** linked to the annotation
- 7) The **approve** column indicates which annotation is approved. [This column is an optional setting controlled by Web API.](#)
- 8) This column indicates which annotation is the **fixed reading line**.
- 9) This column shows the **comments** made by the lab technician on an annotation. Only the first part of the is comment is shown by default. If you hover over the comment you can see the complete comment.
- 10) Button to **create** a new annotation
- 11) Button to **edit** an annotation. The annotation quality code, comments and other annotation properties can be modified here.
- 12) Button to **delete** the selected annotations. A pinned annotations (= fixed reading line) cannot be deleted
- 13) Button to **pin/unpin** (= set fixed reading line) an annotation. [This button is an optional setting controlled by Web API.](#)
- 14) Button to **approve/disapprove** an annotation. [This button is an optional setting controlled by Web API.](#)

4.5. Sample panel

In this panel the information of the Sample is shown. The information is read-only.

The properties are controlled by [Web API](#).

Sample

Number	2017071510043
Number External	
Sample type	STD
Sample state	OK
Catch date	15/07/2017
Length	220

4.6. Graphs panel

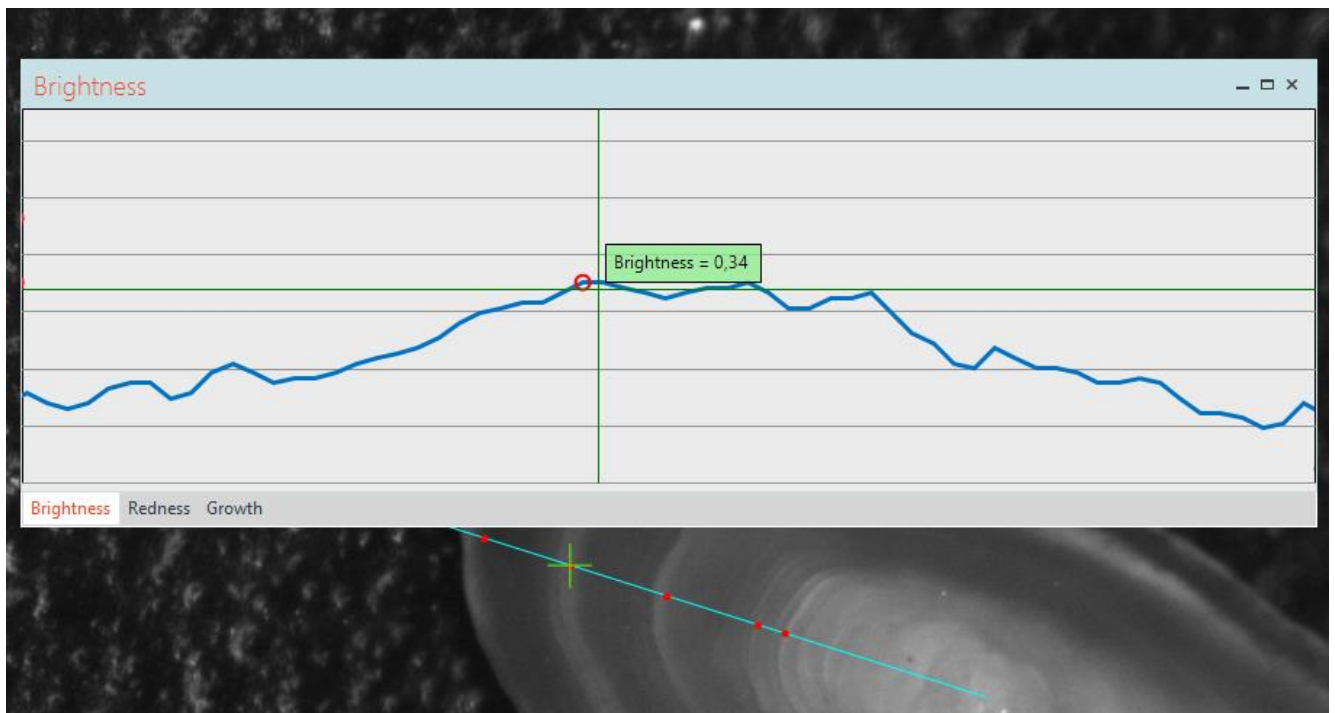
Graphs show more information about the annotation.

4.6.1. Brightness and redness graph

When the user draws a line on the image, the brightness and redness will be visible. All dots on the line will also be drawn. When the user hovers over the graph, it will show the location on the line.

Brightness and redness graphs can be zoomed in by holding CTRL and selecting the area where you want to zoom in. Zooming out again can be done by right clicking.

Brightness and redness graphs can also directly be used to dot. In order to do so, the editor has to be in dot mode. The user can click in the graph where a dot should be added.



4.6.2. Growth graph

The Growth graph displays the distance between the age dots.

4.7. Editor

The editor is where all dotting happens.



13

1) Line mode.

- If selected, the user can draw a line on the image. Left click in the image to start drawing and a the starting point. Move the cursor and left click again in the image to set the end point. Another segment will be added to the end every time. To delete the last segment and end the line, right click. Dot mode will be activated automatically.
- Line properties can be changed by left clicking the arrow on the right hand side of the button.

2) Dot mode.

- If selected, the user can add do to the existing line by left clicking on the desired position. This is also possible in the brightness and redness graph.
- Dot properties can be changed by left clicking the arrow on the right hand side of the button.

3) Delete mode. If selected, the user can delete individual dots or an entire line with all dots.

4) Undo/Redo

5) Measure scale.

- Measures the scale automatically with an OCR algorithm.
- If the automatic detection of the scale fails, the user can choose the manual measure scale option by clicking on the arrow.

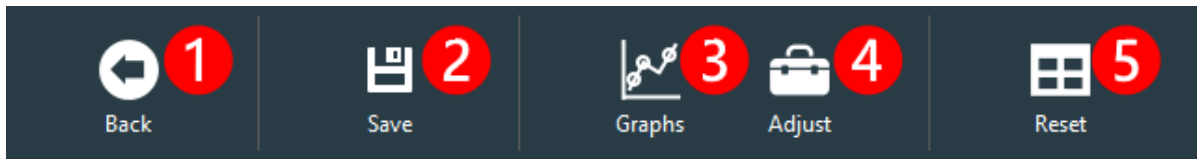
6) Extra file information

- The **filesize** is displayed here
- When the cursor is nearby a dot. The Dot index and the type of the dot will be displayed here

7) Zoom settings

8) Image containing all selected annotations

4.8. Application bar



- 1) Return to the Activity overview screen
- 2) Save progress
- 3) Show/Hide Graphs
- 4) Show/Hide Adjustments
- 5) Reset Layout and user preferences (line and dot properties)