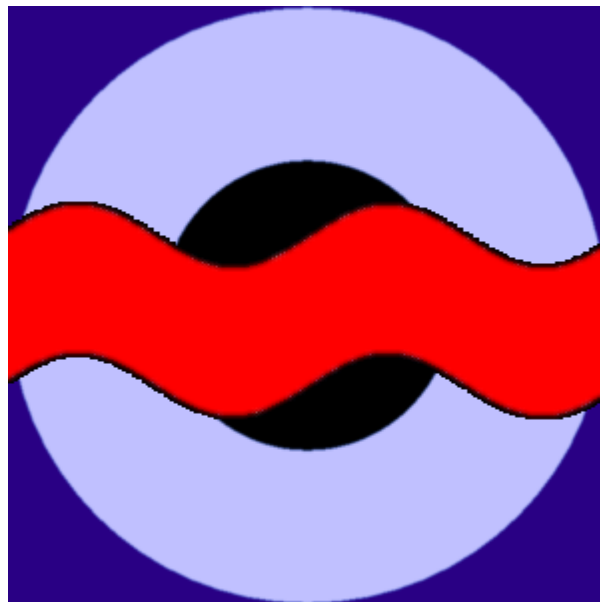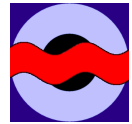# I³S STRAIGHTEN MANUAL

Interactive Individual Identification System

April 2015, version 1.0

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Disclaimer

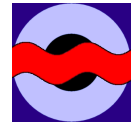## Interactive Individual Identification System - Straighten version 1.0

Contents

1 Introduction

1.1 What is I³S Straighten?

I³S Straighten is an additional tool to the family of photo-identification software tools called I³S. I³S Straighten helps to correct for curvature of the body in the 2D plane. As correction of overall body position requires a 3D model of the animal's body, I³S Straighten can only correct for a limited number of deformations caused by body curvature. It is expected that the relevant area used for photo-identification is (more or less) in the same plane. An example where I³S Straighten can be useful is correction of body curvature of newts.

I³S Straighten will not do any identification; it only helps in preprocessing the images to obtain better results during identification. For identification the reader is referred to packages such as I³S Classic, I³S Spot or I³S Pattern.

We refer in the remainder of this manual to I³S Straighten as I³S.

1.2 Reading this document

In this document all file names, directory names and shell commands are written using the font Courier New. All names relating to a part of the I³S user interface, such as button names or menu options, are boxed. If a message is particularly important the margin will show a large red boxed exclamation mark.

1.3 Bug reports, comments and requests

Please send all bugs, comments and questions to i3s [at] reijns.com. In case of a bug, describe clearly how we can reproduce the bug ourselves. If possible provide us with all relevant data such as images and fgp-files. We will always treat your data as confidential. Data will not be distributed to others without your explicit consent.

In case of errors I³S Straighten may write a log file in the C:\ main directory as I3SStraighten_error_<data>_<time>.log. Please include these files in your bug reports.

1.4 System requirements

This version of I³S requires a Windows 32-bits or 64-bits operation system (XP/Vista/Windows7/Windows8). The software is developed using Java 1.8 and C++ (MS Visual C++ 2010). Both Java and most of the C++ code are platform independent and it should therefore be relatively simple to port it to other platforms such as Linux or Mac OS.

Hardware requirements are at least 2GB of memory (preferably 4GB) and a 2 GHz CPU or faster.
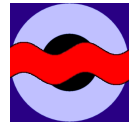
1.5   Software and data requirements

Because the main program is developed in Java, the Java Run-time Environment (JRE) is required. **This distribution will only work with a 32-bits JRE version 1.8.0 or higher!** The JRE 8 (or higher) can be downloaded for free from the Java website or Oracle website.

Note: I³S currently only works with the 32-bits version of the JRE. I³S has been developed on a 64-bits version of Windows 7, however with 32 bits JRE. If a 64-bit JRE is used, I³S will not work properly.

I³S supports JPEG (extension `.jpg`) and GIF (extension `.gif`) images. Support of other image types is currently not foreseen as all known digital cameras can store images as JPEG.

1.6   Installation

Make sure you have <u>administrator rights</u> and <u>turn User Account Control (UAC) off</u>. UAC prevents the proper installation of the Windows environment variables.

Run the file `I3SStraighten_v1.0_Setup.exe`. If your current Java version is not sufficient you will be notified and installation terminates. It is required to install the Java Runtime Environment 1.8.0 (or higher) first.

Apart from some information about the GNU-license, the installation consists of the following steps:
1.   Choosing the home directory where to install the program. Default will be in the directory `C:\Program Files (x86)\I3SStraighten`.

2.   You can indicate if you want I³S to create a folder in the Start menu folder.

3.   Finally, you can select some additional tasks:

   a.   Creating a desktop item.
   b.   Copy the source code. Only if you are interested in using or changing the source code you need to check this item.

1.7   Uninstall

You can uninstall I³S in two simple steps:

1.   Uninstall I³S, using the entry in the start menu.

2.   Optionally you can also uninstall the Java Runtime Environment (JRE). In general it is not a good idea to uninstall JRE without replacing it for a newer version because other programs may depend on it. However, if you still want to uninstall JRE use the standard procedure: Select Programs and Features in the Control Panel. Then select the appropriate item from the list and click on the Add/Remove button.
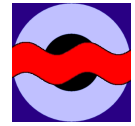
1.8   Quick introduction with a video tutorial

An example is shown in our instruction video at the I³S YouTube channel. The links to our channel is also available at the website and via the Help menu.

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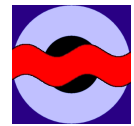
2 The I³S user interface

This chapter will address the possibilities of the I³S user interface. First, the menu bar and toolbar are described. Next, the interaction with the annotation panel is discussed.

2.1 The menu bar

I³S offers a standard Windows look & feel menu-based interface to perform most operations. In the paragraphs below, the three menu items will be explained. An overview of the title and menu bar is shown in Figure 2-1.
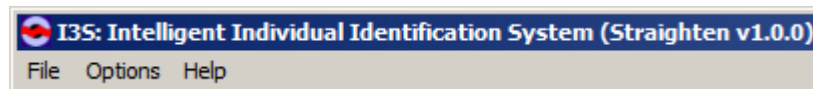

Figure 2-1: The I³S menu bar.

2.1.1 The File menu

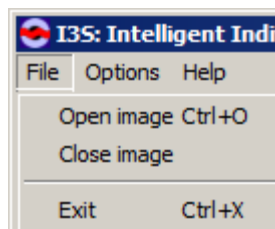This is the main I³S menu. Figure 2-2 shows the operations, which are discussed below:

Figure 2-2: The file menu.

- Open image (shortcut CTRL+O). It will open a window to choose an image file. The supported image types are JPEG and GIF. The starting directory will be the last directory you visited with I³S.

- Close image. It closes the image in the main window. If you have unsaved data I³S will prompt you whether you want to save the data first.

- Exit (shortcut CTRL+X). This operation will close all windows. In case of unsaved data I³S will prompt you whether you want to save the data first.
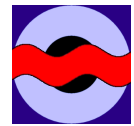
2.1.2 The Options menu

Optional settings allow you to change the optional settings with the window shown in Figure 2-3.
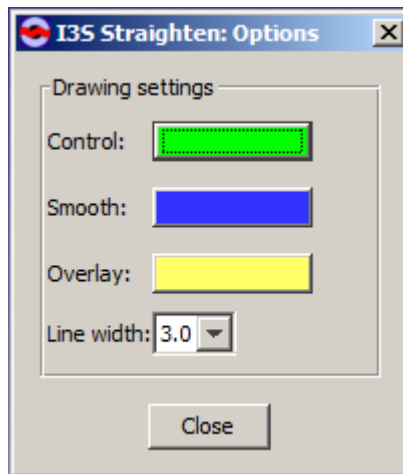
Figure 2-3: The option window.

The options allow you to change the drawing settings used by I³S:
- The color of the control points to indicate the path along the animal's body.
- The color of the smoothed estimation of the body curve.
- The color of the overlay area which indicates the part of the image taken along in the straightening process.
- The width of the lines drawn by I³S.

2.1.3 The Help menu

- Open manual will start your default PDF reader and open this manual.

- Go to the I3S website will open your default web browser and show the I³S website.

- Video tutorials at the I3S YouTube channel will open your default web browser and shows the start page of the I³S channel at YouTube.

- Follow us on Facebook will open your default web browser and shows the Facebook page of I³S.

- About I3S… shows a window with information on version number, authors, copyright and contact details.
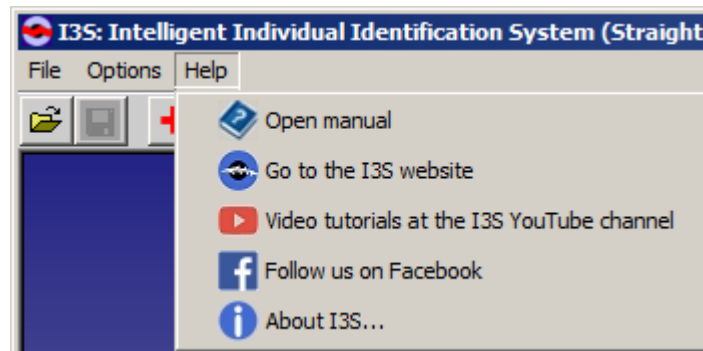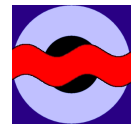
Figure 2-4: The Help menu.

2.2 The tool bar

Below the menu bar I³S shows a tool bar, which offers short cuts to functions described in the previous paragraphs and some new functions. An overview of the tool bar is shown in Figure 2-5.
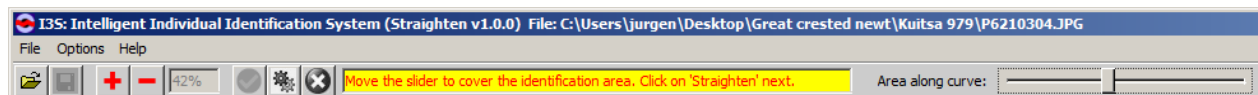

Figure 2-5: The tool bar.

The table below describes the various items in detail. If buttons are gray, you are not at a point in the workflow where you can use them. Either you need to provide more input, or you must go back to a previous step.

(open icon)	Open file.
(save icon)	Save file.
+, **−** and 100%	Controls for zoom. Pressing the plus will zoom in on the image. If the enlarged image does not fit the screen two sliders will appear. The mouse wheel can also be used for zooming. The minus will zoom out. The zoom factor is displayed right of the minus. The maximum allowed zoom factor is 1000%.
(check icon) or (gray check icon)	Finalize the curve. Fit a smooth curve through the control points. At least three control points are required.
(gear icon) or (gray gear icon)	Straighten the image based on the smooth curve.
(red cross icon) or (gray cross icon)	Reject the outcome of the straightening process and return to the control point selection step.
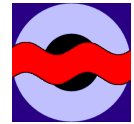
(text field image)	A text field, which will show instructions which input is required. If a message is shown, the field will be yellow.
Area along curve: (slider image)	A slider to adjust the buffer along the smoothed curve which indicates the part of the image that will be included in the straightening process.

2.3 The straightening process

The straightening process consists of 3 steps detailed below:
1. Selection of control points to indicate the general area of interest and the curvature of the body.
2. Fitting of a smooth curve and size of area of interest.
3. Straightening of the image.

Figure 2-6: Control points in green along the curved body of a Great Crested Newt (image from University of Eastern Finland).

2.3.1 Selecting the control points

Click in the image with the left mouse button along the curved body of the animal to add control points. In case the body has high curvature, use more control points. Make sure you cover the entire area used for identification, including the three reference points (we refer you to the manuals of the
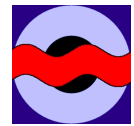
various I³S identification packages for more information on reference points). Figure 2-6 shows an example. By clicking on the right mouse button, the last control point is removed.

You are advised to always follow the same path along the body, e.g. always head to tail, regardless of the orientation in the image. By doing this all the images will have the same orientation which will make processing with one of the other I³S packages easier.
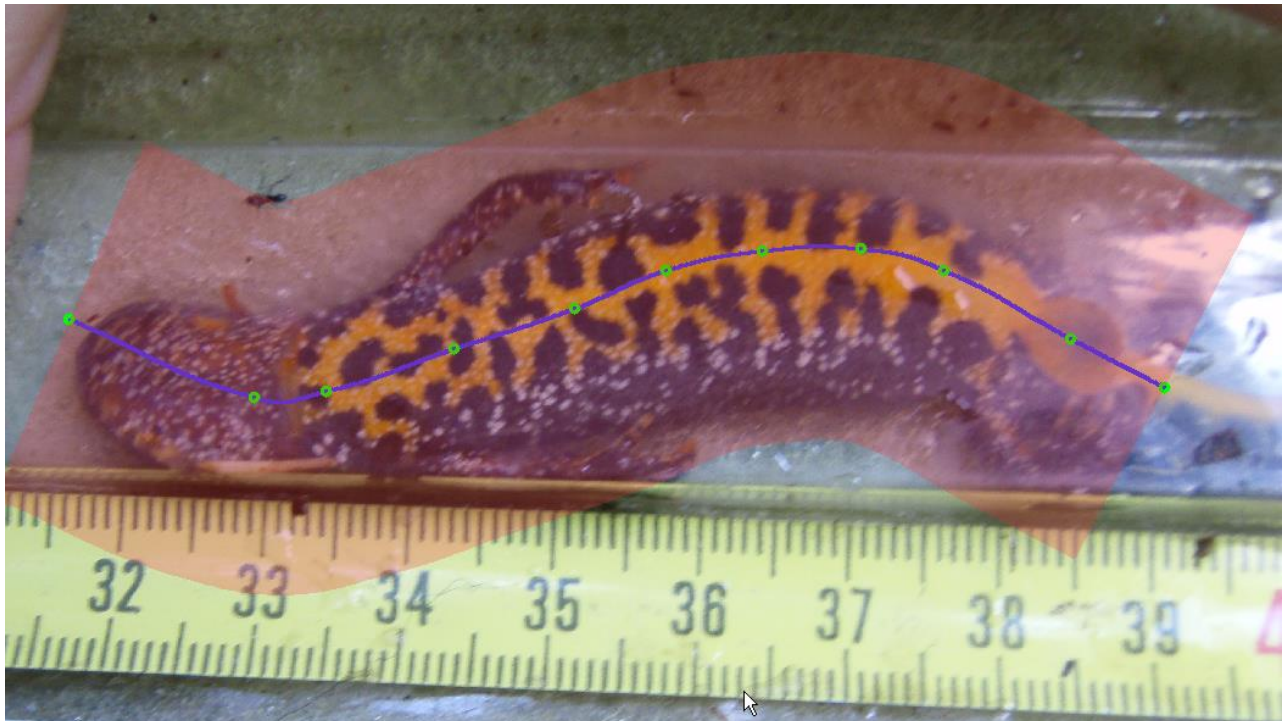
Figure 2-7: Smoothed curve in blue through the green control points. The transparent area in red shows the part of the image which will be straightened.

2.3.2 Smoothening and area selection

If you have added enough control points (three minimum), click on the green finalize button ☑. You will see a smoothed curve through the selected control points and a partly transparent area which shows the part of the image which will be included in the actual straightening. Drag the slider to the left or right to resp. decrease or increase the transparent area. You will see the transparent area change when adjusting the slider. You are advised to select only the part of the image required for identification and reference points.
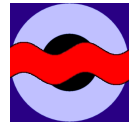
2.3.3 Straightening

If you are satisfied with your selection, click on the process button ⊞. If not click with the right mouse button to return to remove the last control point and return to the control point selection. When clicking on 'process' you will see the straightened image shown in Figure 2-8. To finalize the process click on the save button. If the result is not to your liking, click on the reject button ⊠ to remove the results and return to the control point selection.
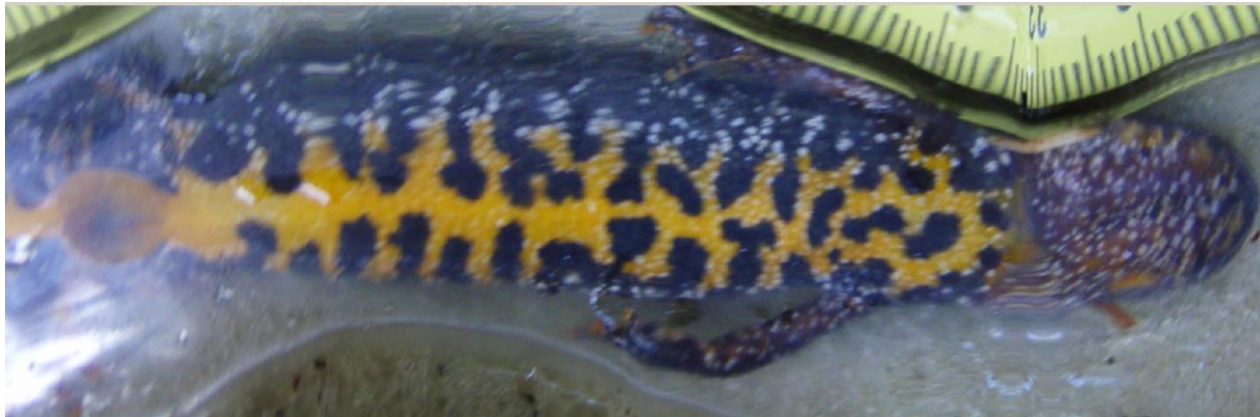
Figure 2-8: Straightened image using the settings shown in Figure 2-7.
Please note that the tail area is now on the left because the image
was annotated tail to head.