Document Name: SOP_VAMPIRE_MACULA_V1

Title: Macula annotation using VAMPIRE annotation kit

Author: Lucia Ballerini

1.0 Background

VAMPIRE (Vascular Assessment and Measurement Platform for Images of the Retina) is an international collaboration developing a software suit for efficient semi-automatic analysis of digital retinal images in clinical research. The project is co-ordinated by two leading groups, Dundee and Edinburgh. The VAMPIRE suite includes interfaces for annotating images, e.g., tracing regions or marking locations in digital retinal images. This is essential to allow clinicians to generate ground truth against which to compare the results of VAMPIRE algorithms. The process of comparing automatic and manual answers is called *validation*.

2.0 Purpose

The macula is the region of the retina with maximum density of photoreceptor. Several automated retinal image analysis need the location of the macular region, or at least its centre, for instance as an anatomical landmark.

The purpose of this document is to describe the protocol that annotator must follow when using the VAMPIRE annotation software tool to mark the centre of the macula and the approximate boundary of the macular region in a digital retinal image.

3.0 Software position on VAMPIRE server

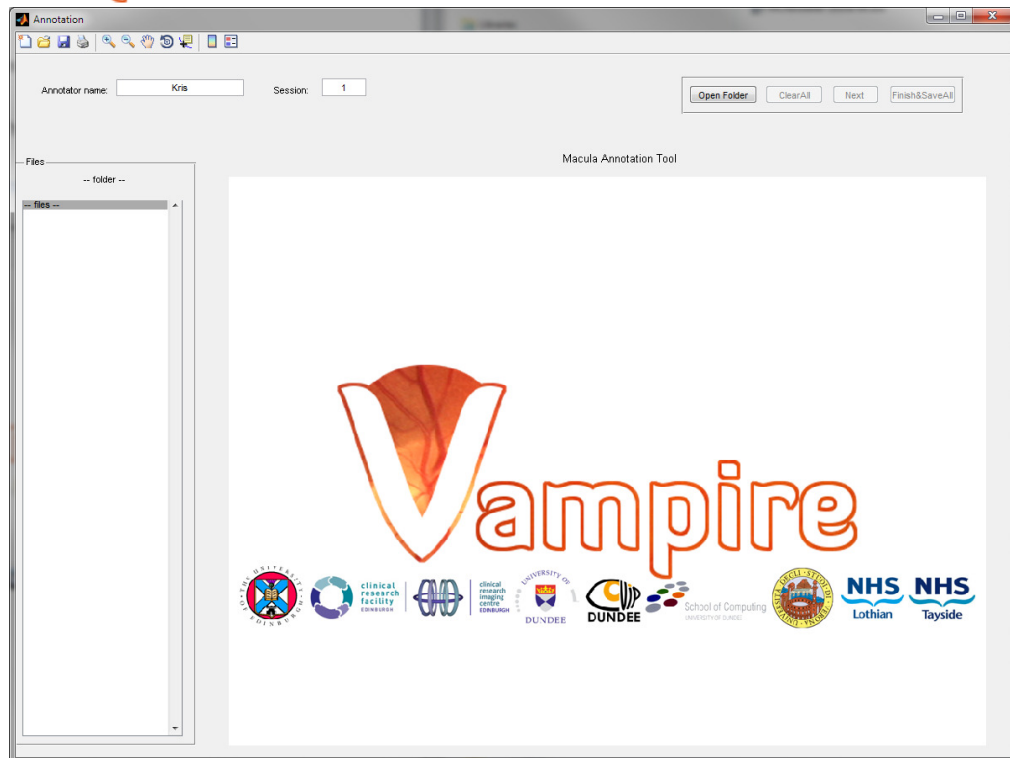http://vampire.computing.dundee.ac.uk/tools.html

4.0 Procedure

The following describes the procedure for manually marking the macula using the VAMPIRE annotation kit software, which is available on PC workstations in the Image Analysis Core or installed on laptop as agreed with VAMPIRE Technical Staff.

> **4.1** The macula annotation tool must have been installed on an agreed target machine by the VAMPIRE technical staff.

> **4.2** To start the annotation tool, double click on its icon. The following window appears:
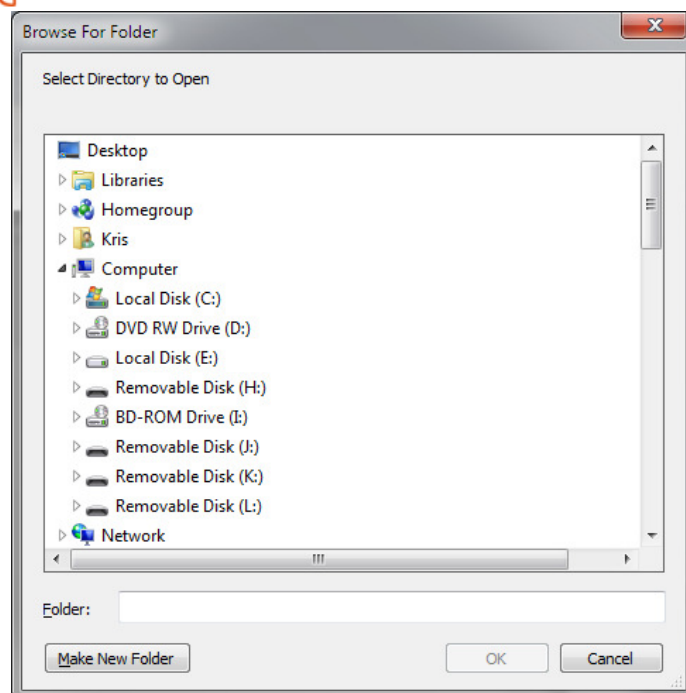
4.3 Start an annotation session:
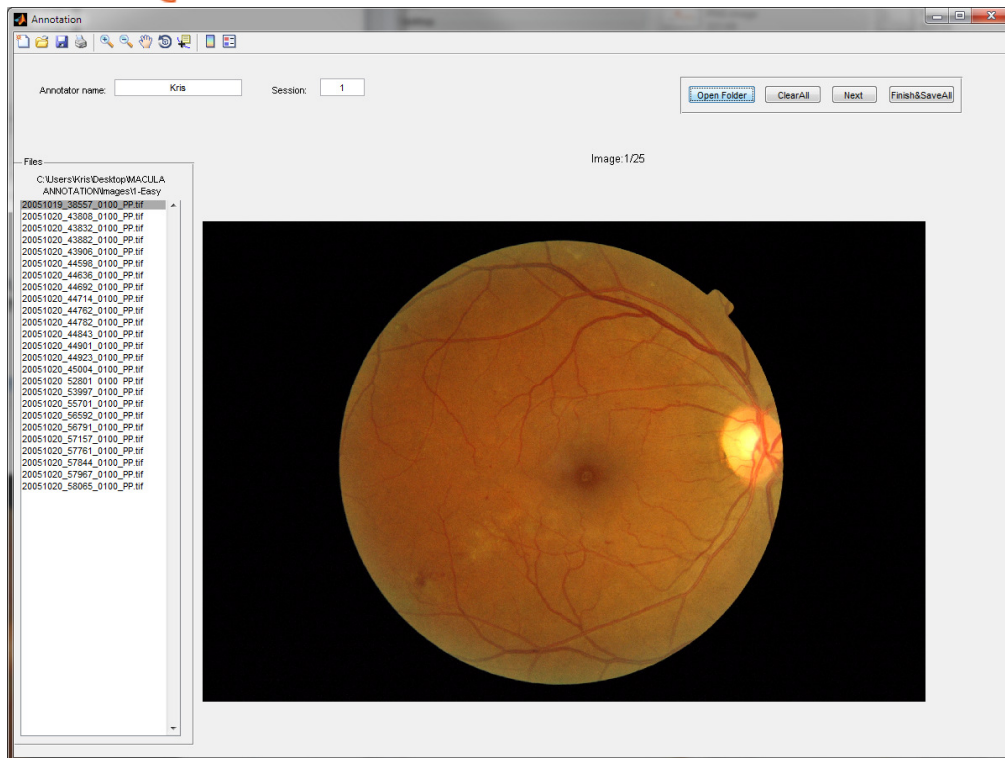
Enter your name under "Annotator name"

Enter the session number under "Session"

4.4 Open a folder containing retinal images:

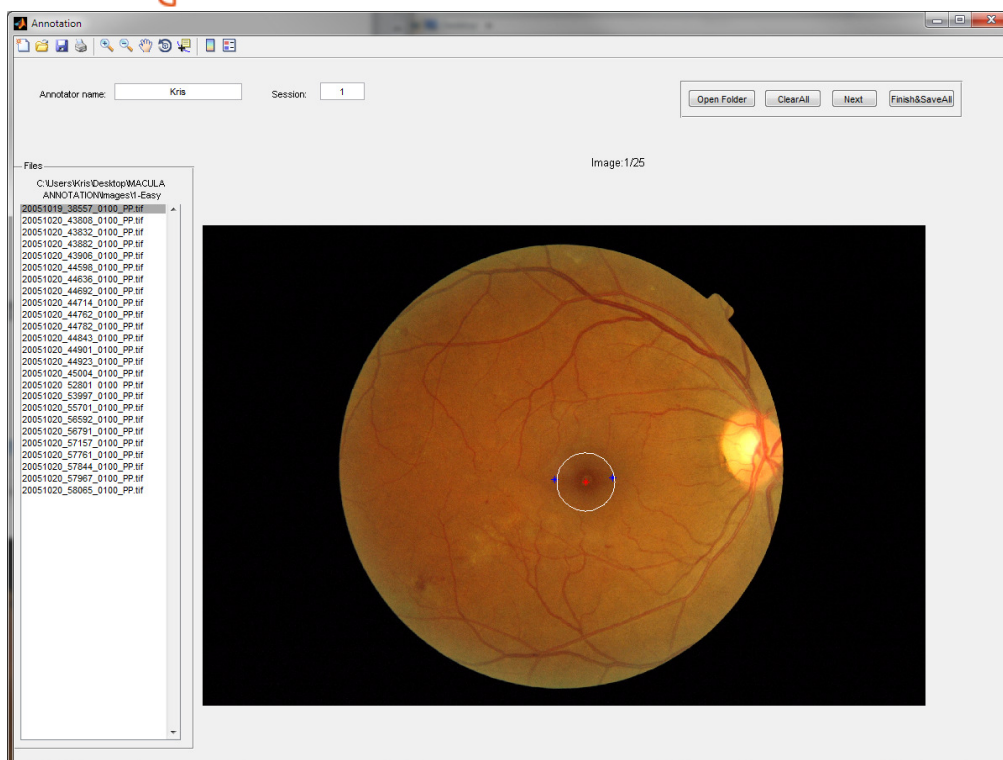Press the Open Folder button, the interface shown below pops up.

Navigate to the desired directory using the above interface, and click the 'OK' button to load the images from that directory. The images from the folder will be loaded and displayed in the annotation software.

4.5 A list of all the loaded images is displayed on the left hand side, with the first image automatically selected. You may select any other image by clicking on its filename in the list (see figure above).

4.6 Click the point which is your best estimate of the centre of the macular region. A red cross appears

4.7 Assuming that the macular region is a circle, click the endpoints of the diameter of the circle enclosing the macular region. A blue cross appears for each point, and the corresponding circle is drawn.

4.8 Press the "Next" button to progress onto the next image, and repeat steps 3.6 – 3.8, or press the "ClearAll" button to delete the dots on the current image and re-process the same image. Continue until all the images in the selected folder have been annotated.

4.9 Click on the "Finish&SaveAll" button to save annotations for all the images annotated to an Excel spreadsheet file.

Please save the result file in the same folder that contains the images used for this annotation. A filename with your name, session number, and date will be automatically generated, simply press 'Save' to complete the annotation process. You may now close the software.