



---

# DOCUMENTATION

---

latest : 2.0

# TABLE OF CONTENTS

## 1. Installation

- i] Docker
- ii] Source code

## 2. Getting started

- i] Docker
- ii] Source code

## 3. Software tools

- i] Color sequences
- ii] Depth sequences

# 1. Installation

## i] Docker

You can find all the information about installing the docker image on your PC on <https://hub.docker.com/repository/docker/sithamfr/growthdata>.

### Load the docker image

*Only tested on Linux systems*

- Install docker on your system
- Enter "[sudo] docker pull sithamfr/growthdata:(version)" in a shell
- Verify the image is in your images with "[sudo] docker images"

\* [...] : depend on your installation of docker, try first without the sudo

\* (version) : currently "1.0", "2.0" or "latest" without the quotes. "2.0" and "latest" are the same version.

**Versions :** *The differences between all the versions is only on the color analysis part. For depth sequences, you just have to import your original sequence.*

- **latest/2.0** : You should import your sequence with your objects of interest already segmented to analyse them.
- **1.0** : You should import your original sequence with objects of interest corresponding to green leaves. The segmentation part is inside the app but the quality depends on the similarity with the training dataset.

## ii] Source code

To install the source code, be sure you have R installed on your machine. You will also need the following libraries : shiny, shinydashboard, shinyWidgets, shinycssloaders, ijtiff, raster, imager, ggplot2, hrbrthemes, plotly, scales and data.table. To well support those R libraries, you will finally need some Linux libraries. Those required Linux libraries are indicated in the CRAN page of each R package.

## 2. Getting started

### i] Docker

You can find all the information about installing the docker image on your PC on <https://hub.docker.com/repository/docker/sithamfr/growthdata>.

#### **Load the docker image**

*Only tested on Linux systems*

- Launch the app with "[sudo] docker run --rm -p 3838:3838 sithamfr/growthdata:(version)"
- Open your browser and go on "localhost:3838" or just click on the link gaved in the shell.

\* [...] : depend on your installation of docker, try first without the sudo

\* (version) : currently "1.0", "2.0" or "latest" without the quotes. "2.0" and "latest" are the same version.

### ii] Source code

To launch the app, you should type *Rscript .launcher* in your shell located in the *app.R* folder. After a short loading time, the software should be launched in your browser. If not, you should have a link given in the shell : click on it and you will be redirected to the software in your browser.

# 3. Software tools

## i] Color sequences

Upload button

Sequence information

Slider for time input

the image sequence to analyse

color\_example.tif

Upload sequence

Factor of resizing :

1

Please wait after uploading the data, until the visualisation is ready and verify your data is well uploaded, using the visualisation of the sequence.  
Be sure your images are encoded on 8 bits.

Your data is loaded on the server when you're using the app and will disappear when you'll leave it. We don't keep any data.

Image visualization

Basic tools  
Crop/Rotation

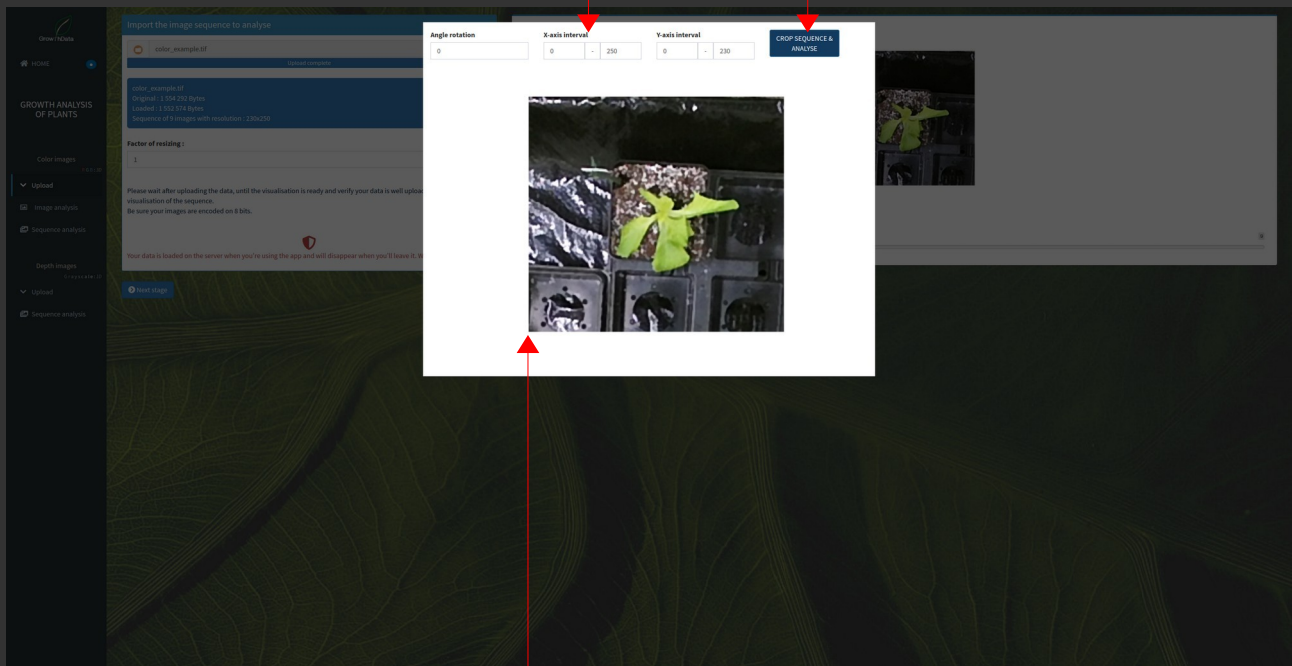
Resizing factor  
if too heavy

Button to go to next stage

The image shows a web application interface for analyzing color sequences. On the left is a dark sidebar with navigation links: HOME, GROWTH ANALYSIS OF PLANTS, Color images, Upload, Image analysis, Sequence analysis, Depth images, and a 'Next stage' button. The main content area is divided into two panels. The top panel, titled 'the image sequence to analyse', contains a file upload section with a text input showing 'color\_example.tif', an 'Upload sequence' button, and a table with sequence details: 'color\_example.tif', 'Original: 1 574 212 Bytes', 'Loaded: 1 552 574 Bytes', and 'Sequence of 5 images with resolution: 120x120'. Below this is a 'Factor of resizing' section with a slider set to '1' and a warning message: 'Please wait after uploading the data, until the visualisation is ready and verify your data is well uploaded, using the visualisation of the sequence. Be sure your images are encoded on 8 bits.' A red shield icon and a note 'Your data is loaded on the server when you're using the app and will disappear when you'll leave it. We don't keep any data.' are also present. The bottom panel shows a large 'Image visualization' of a plant leaf with a green vein network. A small inset window displays a sequence of images with a green plant. A horizontal slider for time input is located below the inset. A blue 'Upload sequence' button is positioned between the two main panels. Red arrows point from text labels to various UI elements: 'Upload button' to the sidebar's 'Upload' link, 'Sequence information' to the table, 'Slider for time input' to the time slider, 'the image sequence to analyse' to the top panel title, 'color\_example.tif' to the file name input, 'Upload sequence' to the button, 'Factor of resizing' to the slider, 'Please wait...' to the warning text, 'Image visualization' to the main leaf image, 'Basic tools Crop/Rotation' to the inset window, 'Resizing factor if too heavy' to the resizing factor section, and 'Button to go to next stage' to the 'Next stage' button in the sidebar.

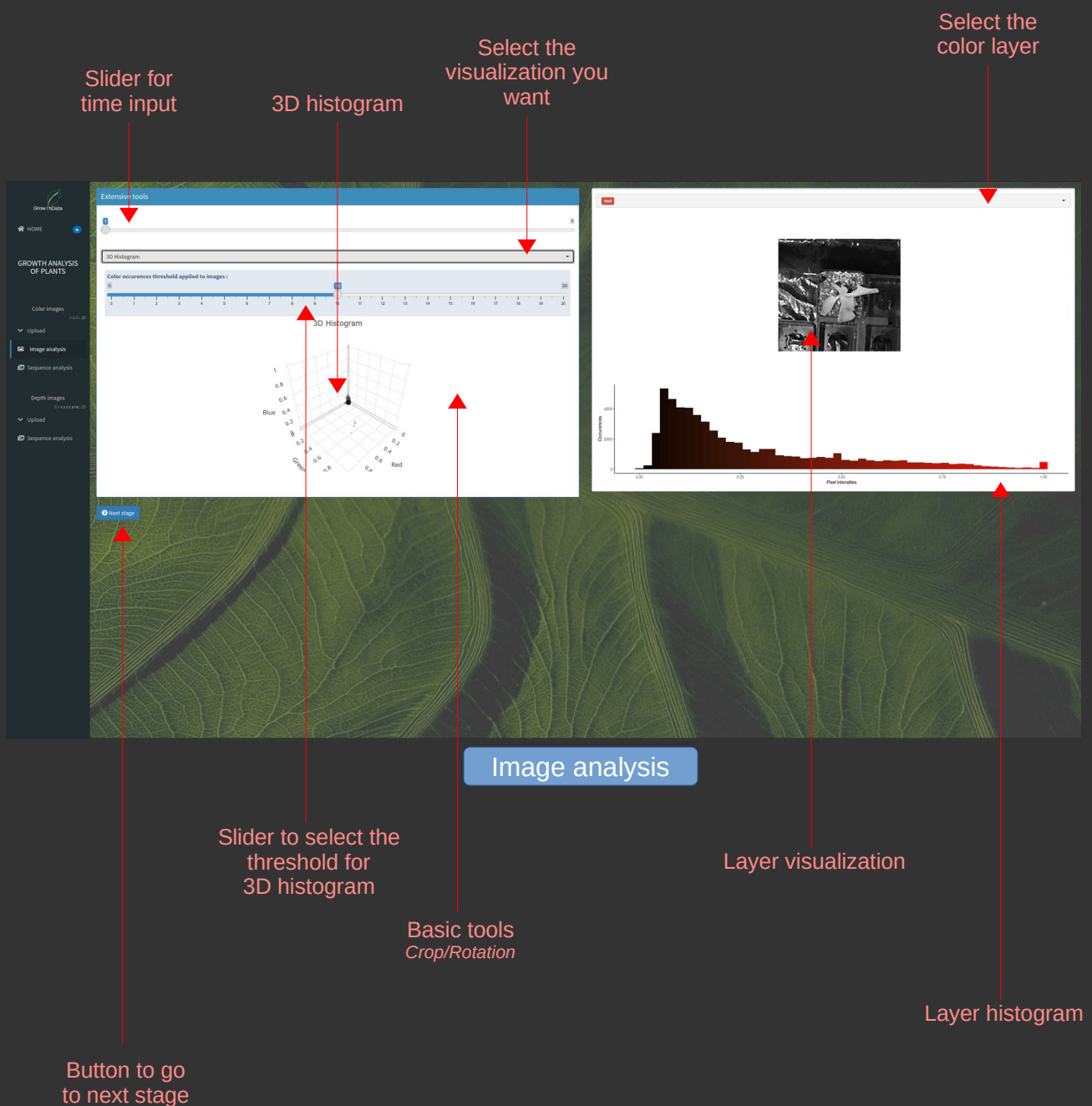
Validate  
modifications

Modification  
parameters



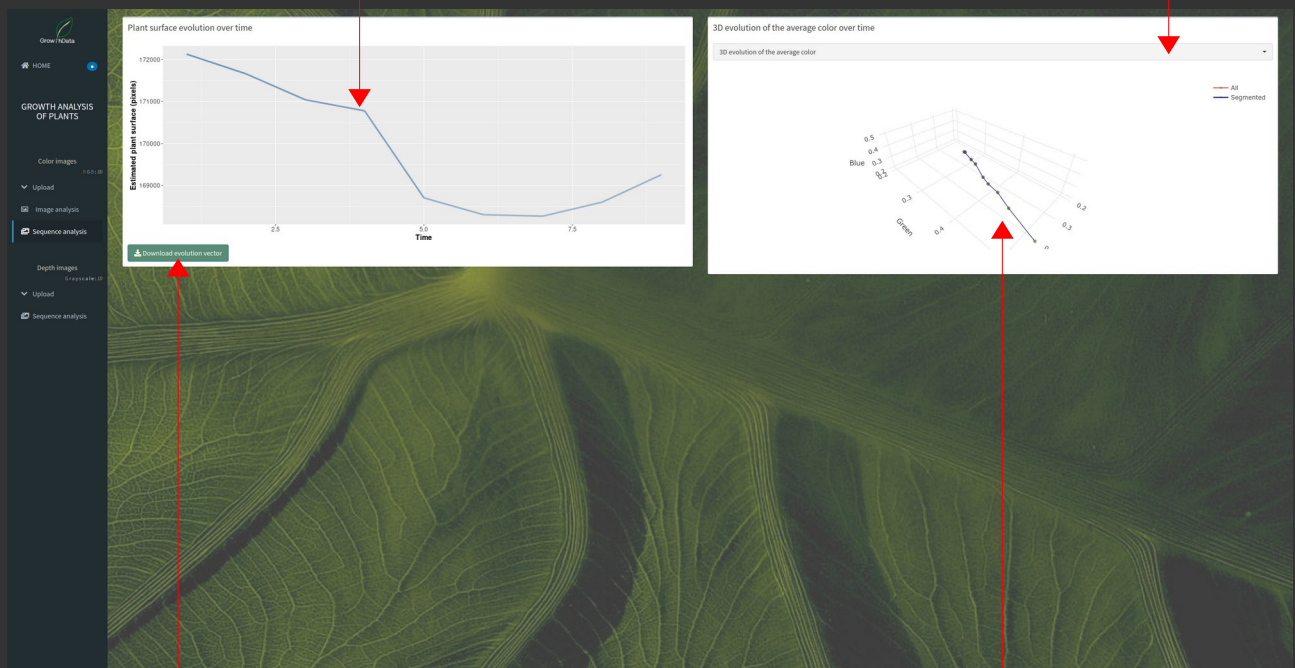
Basic tools

Image visualization



Plant surface  
evolution over time

Select the visualization tool :  
- 3D evolution of the average color  
- Difference between two times



Button to download  
the series of surface

Sequence analysis

3D evolution of the  
average color on  
segmented objects



# ii] Depth sequences

Grow iData

HOME

GROWTH ANALYSIS OF PLANTS

Color images

Upload

Image analysis

Sequence analysis

Depth images

Upload

Sequence analysis

Upload the depth sequence to analyse

depth\_example.tif

Upload complete

depth\_example.tif

Original: 2 432 039 Bytes

Loaded: 2 399 370 Bytes

Sequence of 576 images with resolution: 64x64

Factor of resizing:

1

Please wait after uploading the data, until the visualization is ready and verify your data is well uploaded, using the visualization of the sequence.

Your data is loaded on the server when you're using the app and will disappear when you'll leave it. We don't keep any data.

Next stage

Slider for time input

376

Image visualization

Upload sequence

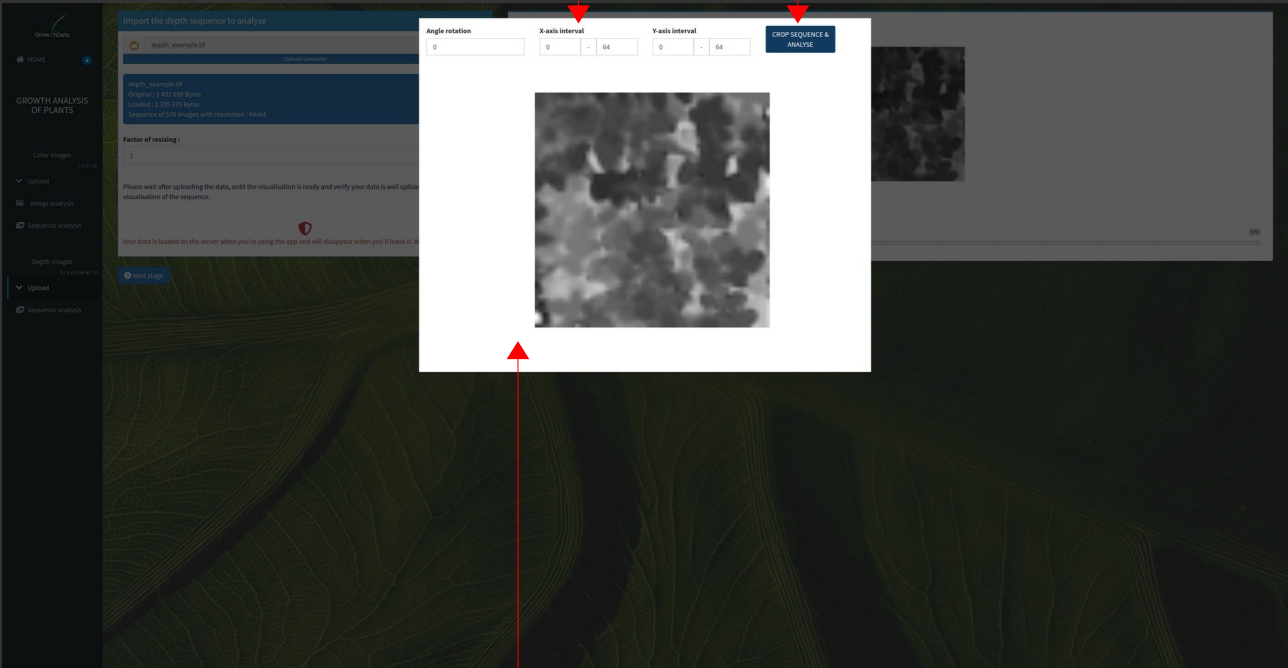
Resizing factor if too heavy

Basic tools Crop/Rotation

Button to go to next stage

Validate  
modifications

Modification  
parameters

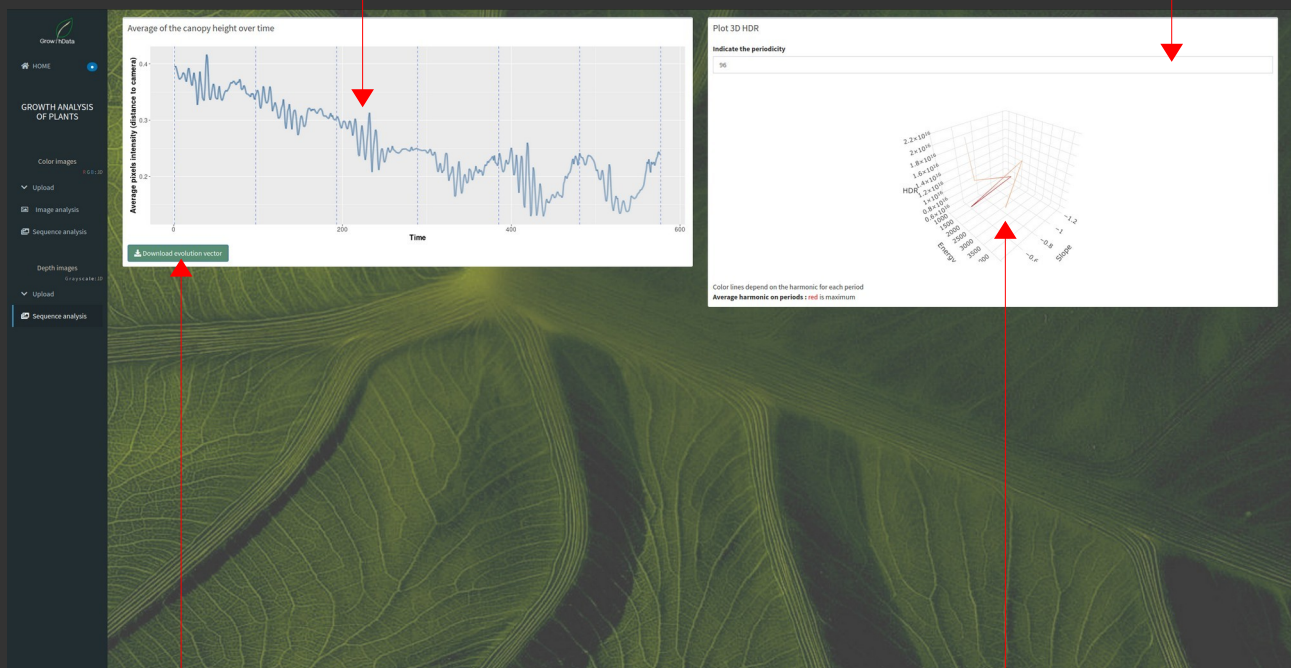


Basic tools

Image visualization

Plant distance  
evolution over time

Select the daily  
number of acquisitions



Sequence analysis

Button to download  
the series of distance

3D evolution of the  
frequential features