**Euler Application Install Guide**

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# 0. Before we start

## 0.1 What this guide is for

This guide describes how to install Ilastik, Cell Profiler, and Fiji on the Euler. In doing so, you can add automation to your image analysis and use the extremely valuable resource of the ETH Euler when processing large volumes of data.

This guide expects that you already have access to the Euler and that you begin each installation process from the root directory.

## 0.2 What is used in this document

* [Euler](https://scicomp.ethz.ch/wiki/Euler): A scientific computing cluster available to those affiliated with ETH when connected to the ETH network (either by being at an ETH campus or vias a VPN).
* [Ilastik](https://www.ilastik.org/)
* [Cell Profiler](https://cellprofiler.org/)
* [Fiji](https://imagej.net/software/fiji/)

## 0.3 Helpful Resources

* [Ubuntu Command Line Cheatsheet](https://linuxsimply.com/wp-content/uploads/2023/05/Linux-ubuntu-commands-cheat-sheet-by-linuxsimply.pdf): You will need to use some basic Ubuntu commands to interact with the Euler in this tutorial. The *Linux Ubuntu Cheat Sheet* by linuxsimply is included in this repository for your reference.
* [Ilastik Installation Guide](https://www.ilastik.org/documentation/basics/installation): A guide on how to install Ilastik on all systems
* [Fiji Installation Guide](https://imagej.net/software/fiji/): A guide on how to install Fiji on all systems
* [Singularity on Euler](https://scicomp.ethz.ch/wiki/Singularity): The ETH wiki on how to use Singularity containers on Euler.
* [Galaxy Depot Software Stack](https://scicomp.ethz.ch/wiki/Galaxy_Depot_Software_Stack): The ETH wiki on the Galaxy Depot Software Stack, containing tens of thousands of containerized software packages.

## 0.4 Tips

* If you ever get lost or confused while navigating the command line, simply type “cd ~” to be taken back to the root directory.
* You can see the available files in whatever directory you are in with the “ls” command.
* If you want to reference a file called “file.txt” in a directory containing: “folder”, “junk.json”, and “file.txt” you only need to type “fi” then press the tab key. The terminal will autocomplete the rest for you!

# 1. Make an ‘Applications’ Directory

Do this with the command:

mkdir ~/Applications

We will save all applications to this directory.

# 2. Ilastik

## 2.1 Installing Ilastik

First, navigate to the ‘Applications’ directory, this will look something like:

cd ~/Applications

Next, we will download Ilastik for Linux with:

wget <https://files.ilastik.org/ilastik-1.4.0.post1-Linux.tar.bz2>

After the download completes, we then extract Ilastik from the tar file with:

tar xjf ilastik-1.\*-Linux.tar.bz2

Finally, after the extraction has completed, you can delete the tar file with:

rm ilastik-1.4.0.post1-Linux.tar.bz2

Ilastik is now installed and ready to use in headless mode!

## 2.2 Configuring ilastik\_application\_path in the settings file

After installing Ilastik, you may wonder how you can use it. In your ImageFlow settings file, there is a setting for the ilastik\_application\_path, which is intended to be the executable path for your Ilastik application. Since we just installed Ilastik, we can now set this value!

To find this file, enter the Ilastik application directory with something along the lines of:

cd ~/Applications/ilastik-1.4.0.post1-Linux

Here, show the contents of this directory with:

ls

Assuming everything installed properly, there should be a file titled *run\_ilastik.sh*. This is the executable that ilastik\_application\_path calls for. You can set ilastik\_application\_path to:

~/Applications/ilastik-1.4.0.post1-Linux/run\_ilastik.sh

# 3. Cell Profiler

3.1 Installing Cell Profiler

We will install Cell Profiler as a Singularity application. Start by entering the Applications directory:

cd ~/Applications

Now make a directory called “Singularity” with a “CellProfiler” subdirectory to store the Cell Profiler app. You can also use this for any other Singularity containers you install in the future:

mkdir -p Singularity/CellProfiler

Enter the CellProfiler directory with:

cd Singularity/CellProfiler

Download the pre-built Cell Profiler container from the Galaxy Depot Software Stack:

wget <https://depot.galaxyproject.org/singularity/cellprofiler:4.2.6--py310h4b81fae_0>

Cell Profiler is now installed and ready to use in headless mode!

## 3.2 Configuring cell\_profiler\_application\_path in the settings file

Now that Cell Profiler is installed, you can configure the cell\_profiler\_application\_path value in your settings file. Because Cell Profiler will be run with Singularity, we will set this value to a Singularity command along with the path to the container we installed in the previous step. Assuming you installed Cell Profiler following the guide in 3.1, the value of cell\_profiler\_application\_path should be:

usr/bin/singularity run ~/Applications/Singularity/CellProfiler cellprofiler

If you installed Cell Profiler somewhere other than described in 3.1, the only part of this you need to change is ~/Applications/Singularity/CellProfiler. Modify this to whatever directory the Cell Profiler container is stored in.

# 4. Fiji

4.1 Installing Fiji

First, navigate to the ‘Applications’ directory, this will look something like:

cd ~/Applications

Next, we will download Fiji for Linux with:

wget [https://downloads.imagej.net/Fiji/latest/fiji-linux64.zip](https://downloads.imagej.net/fiji/latest/fiji-linux64.zip)

After the download completes, we then extract Fiji from the zip file with (note, if unzip is not recognized, you can install it with: apt-get install unzip).

unzip fiji-linux64.zip

Finally, after the extraction has completed, you can delete the zip file with:

rm fiji-linux64.zip

Fiji is now installed and ready to use in headless mode!

## 4.2 Configuring fiji\_application\_path in the settings file

Similarly to Ilastik, this fiji\_application\_path will be set to the executable for the Fiji app. To find this, we enter the Fiji application directory with:

cd ~/Applications/Fiji.app

Here, show the contents of this directory with:

ls

Assuming everything installed properly, there should be a file titled fiji-linux64. This is the executable that fiji\_application\_path calls for. You can set fiji\_application\_path to:

~/Applications/Fiji.app/ImageJ-linux64