# フィールドインフォマティクス 講義用資料

## その1: 事前環境インストール

画像解析(機械学習により画像から植被率を計算)を理解するための Pyton 環境構築 2018 年度 東京大学農学生命科学研究科附属生態調和農学機構 フィールドフェノミクス研究拠点 郭威

NOTE:こちらの文書は2017年フィールドフェノミクス研究拠点に滞在した時、フランス、 "Montpellier SupAgro"校の Laure Fourquet さんの仕事より作成したもの。

This tutorial has been written using Windows 10 with a 64-bit Operating System, x64-based processor

Table of content :	
1. Anaconda Installation and Configuration	2
1.1 Install Anaconda	2
1.2 Set up the environment with python 3.5	4
1.3 Install the packages necessary to run the scripts	5
1.3.1 OpenCV3	5
1.3.2 scikit	5
1.4 Install Spyder	6
2 Test on Spyder	8
2.1 Set the source directory	8

# 1. Anaconda Installation and Configuration

### 1.1 Install Anaconda

Go to the address : <u>https://www.anaconda.com/download/</u> Click on 'Download' for python 3.6 version

### Python 3.6 version \*

64-Bit Graphical Installer (569 MB) (2) 64-Bit Command-Line Installer (491 MB) (2)

Go to the 'Downloads' directory and open the installer: Anaconda3-5.1.0-Windows-x86\_64 Anaconda3-5.01-Windows-x86\_64



#### Follow the steps of the Setup

O Anaconda3 5.1.0 (64-bit) S	etup — 🗆 🗙	Anaconda3 5.1.0 (64-bit)	t) Setup — 🗆 🗙
	Welcome to Anaconda3 5.1.0 (64-bit) Setup		Lioense Agreement Please review the license terms before installing Anaconda3 5, 1, 0 (64-bit).
	Setup will guide you through the installation of Anaconda3 5.1.0 (64-bit).	Press Page Down to see t	he rest of the agreement.
ANACONDA.	It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer. Click Next to continue.	Anaconda End User Licen Copyright 2015, Anacond All rights reserved under Redistribution and use in permitted provided that t	da, Inc. the 3-dause BSD License: source and binary forms, with or without modification, are the following conditions are met:
	Next > Carrel	agreement to install Anaco	< Bark LArree Caprel
Anaconda2 5 1 0 (64 bit) S		Apaconda2 510 (64 h	nit) Satura — 🗆 V
Anaconuas 5.1.0 (04-bit) 5	Select Installation Type	Anacondas 5.1.0 (64-b	Choose Install Location
	Please select the type of installation you would like to perform for Anaconda3 5.1.0 (64-bit).		Choose the folder in which to install Anaconda3 5.1.0 (64-bit).
		Setup will install Anacond	la3 5.1.0 (64-bit) in the following folder. To install in a different
Install for:		folder, click Browse and s	select another folder. Click Next to continue.
Just Me (recommended)			
	ni denne)		
	n mieges)	Destination Folder d:¥Anaconda3	Browse
		Space required: 2.5GB Space available: 439.2GB	8
Anaconda, Inc. ————	< Back Next > Cancel	Anaconda, Inc. ————	< Back Next > Cancel

Anaconda3 5.1.0 (64-bit) Setup	O Anaconda3 5.1.0 (64-bit) Setup
Advanced Installation Options Customize how Anaconda integrates with Windows	Installing ANACONDA Please wait while Anaconda3 5.1.0 (64-bit) is being installed.
Advanced Options Add Anaconda to my PATH environment variable Not recommended. Instead, open Anaconda with the Windows Start menu and select 'Anaconda (64-bit)". This 'add to PATH' option makes Anaconda get found before previously installed software, but may cause problems requiring you to uninstal and reinstall Anaconda. Register Anaconda as my default Python 3.6 This will allow other programs, such as Python Tools for Visual Studio PyCharm, Wing IDE, PyDev, and MSI binary packages, to automatically detect Anaconda as the primary Python 3.6 on the system.	Extract: python-3.6.44h6538335_1.tar.bz2
Anaconda, Inc < Back Install Cancel O Anaconda3 5.1.0 (64-bit) Setup X Anaconda3 5 1.0 (64-bit) Microsoft Visual Studio Code Installation	Anaconda, Inc <back next=""> Cancel Cancel Anaconda3 5.0.1 (64-bit) Setup X Thanks for installing Anaconda3!</back>
Anaconda has partnered with Microsoft to bring you Visual Studio Code. Visual Studio Code is a free, open source, streamlined cross-platform code editor with excellent support for Python code editing, IntellSense, debugging, linting, version control, and more. To install Visual Studio Code, you will need Administrator Privileges and Internet connectivity. Visual Studio Code License	Anaconda is the most popular Python data science platform. Share your notebooks, packages, projects and environments on Anaconda Cloud! Learn more about Anaconda Cloud Learn more about Anaconda Support
< Back Skip Cancel	< Back Finish Cancel

#### Find and open the Anaconda Navigator in your Application directory



## 1.2 Set up the environment with python 3.5

The default environment in Anaconda called 'root' uses python 3.6 but we need python 3.5 to be able to use openCV. The easiest way is to create a new environment in which python 3.5 will be installed.

forme	Search Environments	Q		installed	v Charrets Update index. Search Paciases Q	
	mat			Name	7 Description	Versie
invironments				🛛 jejv jab je jest	0	0.5.
				alabaster	O Configurable, python 2+3 compatible sphine theme	0.7.
Projects (beta)				E anaconda	0	14
				aneconde-client	O Anaconduoro command line client library	16
learning				anacondo-project	O Reproducible, executable project directories	0.8
Community				asetcrypto	O Asin's parser and serializer	0.2
				astroid	Abstract system tree for pathon with inference support	15
				astropy	O Community-developed python library for astronomy	2.0
				a tobel	O Utilities to internationalize and localize python applications	2.5
				deciports	0	1.0
				teciports.shutil	0	1.0
			`	beautifutioup4	O Python library designed for screen-scraping	4.6
				Diterrey	○ Efficient representation of arrays of booleans c extension	0.5
				d bicharts	O Optional high level charts upl built on top of bokeh	6.2
				E blaze	O Numpy and pandas interface to big data	0.1
				M bleach	O Easy whitelist-based htmi-sanitizing tool	2.0.
				d bolich	O Python interactile visualization library for modern web browsers	0.1
locumentation				🖬 boto	O Amazon web services library	2.4
_				bottleneck	O fest numpy array functions written in option.	12
Developer Blog				🖬 beip2	O High-quality data compressor	1.0
				ce-certificates	0	201
Feedback				Cachecontrol	O Http8b2 caching algorithms for use with requests	0.17
				certifi	O Python package for providing mozilia's ca bundle.	201
	Create Clone	Import Remo		217 packages evaluable		

Go to 'Environment' (Left grey column, under 'Home')

Click on Create. This window appears :

Create new environment X								
Name:	Pytho3_5							
Location:	C:\Users\fieldphenomics\Anaconda3\envs\Pytho3_5							
Packages:	Python 3.5 V							
	R							
	Cancel Creat	e						

Choose a name for the new environment, select python 3.5 and click on The new environment now appear under 'root'.

Search Environments	۹
root	
Pytho3_5	•

## 1.3 Install the packages necessary to run the scripts

The scripts require the user to install several packages :

- openCV 3
- scikit-image
- scikit-learn

#### 1.3.1 OpenCV3

Look for the name of the package in the search bar and select 'All' in the menu. search "opencv"

		AVIGATOR	Upgrade Nov	Sign in to Anaconda Cloud
🕇 Home	Searc	h Environments C	Q All v Channels Update index openo/ X	
Environments	rot	ot	Name Y T Description	Version
	Pyt	tho3_5		3.3.1
💼 Projects (beta)				
Select op	encv a	and click on	at the bottom right corner	
	ONDAIN	IAVIGATOR	🚺 Upgrade Now	Sign in to Anaconda Cloud
A Home	Searc	ch Environments	Q All · Channels Update index opency X	
	ro	ωt	Name Y T Description	Version
The Environments	Py	tho3_5		3.3.1
🚔 Projects (beta)		<b>e</b> 2 i		
Search the web	and Windows	O		へ 記 dg 同 ENG 10:50 AM 1/11/2019
Click on	Apply	again.		
Install Packages		x		
9 packages will be in	Unlink Link	Channel	×	
1 opency	- 3.3.1	defaults		
2 *icc_rt	- 2017	0.4 defaults		
3 *intel-openmp	- 2018	3.0.0 defaults		
4 *jpeg	- 9b	defaults		
5 *libpng	- 1.6.3	2 defaults		
6 *libtiff	- 4.0.9	defaults		
7 *mkl	- 2018	3.0.1 defaults		
* indicates the pac	kage is a depend	ency of a selected package		
		Cancel Apply	8	

#### 1.3.2 scikit

Repeat for scikit-image and scikit-learn. You can download the two at the same time.

	0	ANACOND	ANAVIG	ATOR				0	Upgrade Now	Sign in to An	econda Cloud
	но	me	Search Environmen	its	Q,	All		Channels Update index sci X			
			root			Name		Y T Description		,	Version
1	En:	dronments	Pytho3_5			D libnetc	df	O Support for array-oriented scientific data			4.4.1
	Pro	siects (beta)				🛛 mayavi		O The mayari scientific data 3-dimensional visualizers			4.5.0
		Jeens (overly				D pyqtgra	ph	O Scientific graphics and gui library for python			0.10.0
ŝ	Lea	ming				🔛 selkit-li	nage	Q Image processing routines for scipy			0.13.0
						🖬 scikit-le	earn	Q Set of python modules for machine learning and data mining			0.19.0
	Co	mmunity				🔲 scikit-r	( <sup>-</sup>	O Object oriented rf/microwave engineering			0.14.3
						Scikits-	image	0			0.7.1
						🔲 scipy		Q Scientific library for python			0.19.1
						spyder		O scientific python development environment			3.2.3
						unideco	ode	O Ascil transliterations of unicode text			0.04.21
	38 pi	ackages will be in	stalled		-1		^				
		Name	Unlink	Link	Channe	el l	Â				
	1	scikit-image	-	0.13.1	default						
	2	scikit-learn	-	0.19.1	default	;					
	3	*bokeh	-	0.12.13	default						
	4	*click	-	6.7	default	;					
	j	e al a constant al dia		0.5.2	J . C IN						
	5	*cloudpickle	-	0.5.2	derault	•					
	6	*cycler	-	0.10.0	default	;					
	7	*dask	-	0.16.0	default		$\sim$				
	• ind	icates the packa	ge is a depen	dency of a	selecter <u>Cancel</u>	l package Apply	s				

## 1.4 Install Spyder



Click on under Spyder	spyder 3.2.6
★ For the second se	
Lauch Spyder by clicking on	aunch

# 2 Test on Spyder

## 2.1 Set the source directory

When you open spyder, this is what you can see :



Input commends in "Console" and check if the library are well installed. import cv2 from skimage import morphology

from sklearn import svm

