



**University of  
Zurich<sup>UZH</sup>**



The KEY-Institute for  
Brain-Mind Research  
Department of Psychiatry,  
Psychotherapy and Psychosomatics,  
University Hospital of Psychiatry,  
Zurich


# EEG Microstate Analysis with keypy

## Installation Guidelines

# Installation Options

- ▶ [Windows - easy \(with Anaconda\)](#)
- ▶ [Windows - no Anaconda](#)
- ▶ [Mac - easy \(with Anaconda\)](#)
- ▶ [Linux](#)
- ▶ [Windows Problems](#)
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# Windows - easy (with Anaconda) [1]

- ▶ Install Anaconda (includes interpreter and keypy dependencies)
  - ▶ Go to: <https://www.continuum.io/downloads>
  - ▶ Download: **Python 2.7** Windows 64-Bit / 32-Bit Graphical Installer
  - ▶ Double-click the .exe file to install Anaconda and follow the instructions on the screen
  - ▶ Recommendation:
    - ▶ «add anaconda to my Path environment variable»
    - ▶ And
    - ▶ «register Ananconda as default Python 2.7»
- ▶ Install keypy
  - ▶ click on the Windows Key  and R
  - ▶ Type «cmd» and enter
  - ▶ In the command window that opens, type «pip install keypy»
  - ▶ Make sure you have the latest version, type «pip install --upgrade keypy»

# Windows - easy (with Anaconda) [2]

- ▶ Install HDFView (allows you to look at the keypy output hdf5 files)
  - ▶ Download location:  
<https://www.hdfgroup.org/products/java/release/download.html#download>
- ▶ Get example script and data
  - ▶ Go to: [https://drive.google.com/open?id=0B6Y5eNu92\\_UQZy1BYnNsVFUySGs](https://drive.google.com/open?id=0B6Y5eNu92_UQZy1BYnNsVFUySGs)
  - ▶ Download “example.zip”
  - ▶ Extract the downloaded folder (right click, extract all to your preferred destination)
- ▶ Run example script
  - ▶ Start spyder (new program that was installed with Anaconda)
  - ▶ Click on new project
  - ▶ Create a new Spyder Workspace in the directory where you extracted the keypy example files to (e.g. «C:\Users\...\example»)
  - ▶ Open the file «run\_example\_analysis1.py» (click on File, Open)
  - ▶ Run script (click on the F5 key or on the green arrow right to the save all files button)
  - ▶ The script should now run.

# Windows - easy (with Anaconda) [3]


- ▶ You should now have successfully installed keypy.
- ▶ If everything worked out correctly, you should get the following message: “Parameter results were written to outputfolder.”
- ▶ You ran into problems? Check out the “Windows Problems” section at the end of this pdf.
- ▶ Does not help? Contact us: [patricia.milz@key.uzh.ch](mailto:patricia.milz@key.uzh.ch)
  - ▶ Please list which steps you took and where you get an error / problem.
  - ▶ Include the error message you get within the email!



# Windows - no Anaconda [1]

- ▶ Install an interpreter / text editor option
  - ▶ [Visual Studio Community \(with Python Tools for Visual Studio\)](#)
  - ▶ [Spyder](#) (integrated in Anaconda)
  - ▶ [Sublime Text](#)
  - ▶ [Notepad++](#)
- ▶ Install Python 2.7 or
  - ▶ [Python 2.7 MSI Installer](#) (select: Windows x86(-64) MSI installer for 64-bit PCs)
- ▶ Download packages that keypy relies on: numpy, hf5py, SciPy
  - ▶ Download location: <http://www.lfd.uci.edu/~gohlke/pythonlibs/>
  - ▶ Download file names (27 refers to the Python version, 64 to a 64 bit system):
    - ▶ numpy-1.11.0+mkl-cp27-cp27m-win\_amd64.whl
    - ▶ h5py-2.5.0-cp27-none-win\_amd64.whl
    - ▶ scipy-0.17.0-cp27-none-win\_amd64.whl

# Windows - no Anaconda [2]

- ▶ Install packages via pip
  - ▶ Open Command Prompt (Win 10 click on Windows symbol , type cmd, enter)
  - ▶ navigate to the folder where you downloaded the ".whl"-files to
  - ▶ Type:
    - ▶ pip install numpy-1.11.0+mkl-cp27-cp27m-win\_amd64.whl
    - ▶ pip install h5py-2.5.0-cp27-none-win\_amd64.whl
    - ▶ pip install scipy-0.17.0-cp27-none-win\_amd64.whl
- ▶ Update all packages to latest version (in the same command prompt, same folder)
  - ▶ pip install --no-index --upgrade scipy-0.17.0-cp27-none-win\_amd64.whl
  - ▶ pip install --no-index --upgrade numpy-1.11.0+mkl-cp27-cp27m-win\_amd64.whl
  - ▶ pip install --no-index --upgrade h5py-2.5.0-cp27-none-win\_amd64.whl
- ▶ Install HDFView (allows you to look at the keypy output hdf5 files)
  - ▶ Download location:  
<https://www.hdfgroup.org/products/java/release/download.html#download>



# Windows - no Anaconda [3]

- ▶ Install keypy
  - ▶ Download location: <https://pypi.python.org/pypi/keypy>
  - ▶ Download the latest version of keypy: keypy-2.\*.\*.win32.exe (md5)
  - ▶ Double click to install
- ▶ Get example script and testing data
  - ▶ Go to: [https://drive.google.com/open?id=0B6Y5eNu92\\_UQZy1BYnNsVFUySGs](https://drive.google.com/open?id=0B6Y5eNu92_UQZy1BYnNsVFUySGs)
  - ▶ Click on «Download ZIP»
  - ▶ Extract the downloaded folder (right click, extract all to your preferred destination)

# Windows - no Anaconda [4]

- ▶ Run example script (example with Spyder)
  - ▶ Start spyder (new program that was installed with Anaconda)
  - ▶ Click on new project
  - ▶ Create a new Spyder Workspace in the directory where you extracted the keypy example files to (e.g. «C:\Users\...\example»)
  - ▶ Open the file «run\_example\_analysis1.py» (click on File, Open)
  - ▶ Run script (click on the F5 key or on the green arrow right to the save all files button)
  - ▶ The script should now run.

# Windows - no Anaconda [5]

- ▶ You should now have successfully installed keypy.
- ▶ If everything worked out correctly, you should get the following message: “Parameter results were written to outputfolder.”
- ▶ You ran into problems? Check out the “Windows Problems” section at the end of this pdf.
- ▶ Does not help? Contact us: [patricia.milz@key.uzh.ch](mailto:patricia.milz@key.uzh.ch)
  - ▶ Please list which steps you took and where you get an error / problem.
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# Windows -experience with Github [1]

- ▶ Get keypy (from Github Repository) and its dependencies
  - ▶ Install a text editor, Python 2.7 and keypy dependencies (see Windows easy / Windows (no Anaconda))
  - ▶ Go to keypy github repository main page: <https://github.com/keyinst/keypy>
  - ▶ Clone the current master branch of keypy
  - ▶ For more info on what to do afterwards, see Windows easy / Windows (no Anaconda)



# Mac - easy (with Anaconda) [1]

- ▶ Install Anaconda (includes interpreter and keypy dependencies)
  - ▶ Go to: <https://www.continuum.io/downloads>
  - ▶ Download: **Python 2.7** Windows 64-Bit / 32-Bit Graphical Installer
  - ▶ Double-click the .exe file to install Anaconda and follow the instructions on the screen
  - ▶ Recommendation:
    - ▶ «add anaconda to my Path environment variable»
    - ▶ And
    - ▶ «register Ananconda as default Python 2.7»
- ▶ Install keypy
  - ▶ Open a terminal
  - ▶ In the terminal, type «pip install keypy»
  - ▶ Make sure you have the latest version, type «pip install --upgrade keypy»

# Mac - easy (with Anaconda) [2]

- ▶ Install HDFView (allows you to look at the keypy output hdf5 files)
  - ▶ Download location:  
<https://www.hdfgroup.org/products/java/release/download.html#download>
- ▶ Get example script and testing data
  - ▶ Go to: [https://drive.google.com/open?id=0B6Y5eNu92\\_UQZy1BYnNsVFUySGs](https://drive.google.com/open?id=0B6Y5eNu92_UQZy1BYnNsVFUySGs)
  - ▶ Click on «Download ZIP»
  - ▶ Extract the downloaded folder (right click, extract all to your preferred destination)
- ▶ Run example script
  - ▶ Start spyder (new program that was installed with Anaconda)
  - ▶ Click on new project
  - ▶ Create a new Spyder Workspace in the directory where you extracted the keypy example files to (e.g. «C:\Users\...\example»)
  - ▶ Open the file «run\_example\_analysis1.py» (click on File, Open)
  - ▶ Run script (click on the F5 key or on the green arrow right to the save all files button)
  - ▶ The script should now run.



# Mac - easy (with Anaconda) [3]

- ▶ You should now have successfully installed keypy.
- ▶ If everything worked out correctly, you should get the following message: “Parameter results were written to outputfolder.”
- ▶ You ran into problems? Check out the “Windows Problems” section at the end of this pdf. Similar problems might occur on Macs.
- ▶ Does not help? Contact us: [patricia.milz@key.uzh.ch](mailto:patricia.milz@key.uzh.ch)
  - ▶ Please list which steps you took and where you get an error / problem.
  - ▶ Include the error message you get within the email!



# Linux [1]

- ▶ Install a text editor
  - ▶ [Visual Studio Community \(with Python Tools for Visual Studio\)](#)
  - ▶ [Spyder](#) (integrated in Anaconda)
  - ▶ [Sublime Text](#)
  - ▶ [Notepad++](#)
- ▶ Install Python
  - ▶ [Version 2.7](#)
- ▶ Download and install pip and keypy dependencies
  - ▶ numpy, scipy, h5py
- ▶ Install keypy
  - ▶ Open a command window and type:
    - ▶ `sudo pip install keypy`

# Linux [2]

- ▶ Get example script and testing data
  - ▶ Go to: [https://drive.google.com/open?id=0B6Y5eNu92\\_UQZy1BYnNsVFUySGs](https://drive.google.com/open?id=0B6Y5eNu92_UQZy1BYnNsVFUySGs)
  - ▶ Click on «Download ZIP»
  - ▶ Extract the downloaded folder (right click, extract all to your preferred destination)

# Linux [3]

- ▶ Run example script (example with Spyder)
  - ▶ Start spyder (new program that was installed with Anaconda)
  - ▶ Click on new project
  - ▶ Create a new Spyder Workspace in the directory where you extracted the keypy example files to (e.g. «C:\Users\...\example»)
  - ▶ Open the file «run\_example\_analysis1.py» (click on File, Open)
  - ▶ Run script (click on the F5 key or on the green arrow right to the save all files button)
  - ▶ The script should now run.

# Linux [4]

- ▶ You should now have successfully installed keypy.
- ▶ You ran into problems? Check out the “Windows Problems” section at the end of this pdf. Similar problems might occur on Linux.
- ▶ Does not help? Contact us: [patricia.milz@key.uzh.ch](mailto:patricia.milz@key.uzh.ch)
  - ▶ Please list which steps you took and where you get an error / problem.
  - ▶ Include the error message you get within the email!



# Windows - Problems? [1]

- ▶ Testing installations

- ▶ Open a command window and type:

- ▶ python

- ▶ #should start Python

- ▶ if not: make sure you have the folder with your Python Installation added to your Windows Path  
(see [How to add Python to Windows Path](#))

- ▶ import numpy

- ▶ #should import numpy with no errors

- ▶ If not, reinstall numpy and upgrade numpy to the latest version

- ▶ import scipy

- ▶ #should import scipy with no errors

- ▶ If not, reinstall scipy and upgrade scipy to the latest version

- ▶ Import h5py

- ▶ #should import h5py with no errors

- ▶ If not, reinstall h5py and upgrade h5py to the latest version



# Windows - Problems? [2]

- ▶ Testing installations

- ▶ Open a command window and type:

- ▶ python

- ▶ #should start Python

- ▶ if not: make sure you have the folder with your Python Installation added to your Windows Path  
(see [How to add Python to Windows Path](#))

- ▶ import keypy

- ▶ should import keypy with no errors

- ▶ If not, reinstall keypy as described in the tutorial

- ▶ If it still does not work (worst case scenario), copy the keypy folder within the folder you can download from github (keypy-master zip file) to your local library path (e.g. C:\...\Anaconda\Lib\site-packages).





# About

- ▶ *keypy* is an open source library being developed at the KEY Institute for Brain-Mind Research.
- ▶ It allows the automated computation of the EEG microstate analysis based on continuous EEG data.
- ▶ *keypy* was extensively tested during the development process and validated with existing software solutions for EEG microstate analysis. However, bugs / problems cannot be completely out ruled. Should you run into bugs / find a problem, let us know!
- ▶ Missing a feature? Feel free to contact us and let us know what you would need.
- ▶ Contributors most welcome!
  - ▶ Would you like to contribute to *keypy* / add features / outputs / additions?
  - ▶ We are thankful for any help, support, and additions!
- ▶ Contact: [patricia.milz@key.uzh.ch](mailto:patricia.milz@key.uzh.ch)