# EEG Microstate Analysis with keypy

Installation Guidelines

# Installation Options

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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 [image] 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
  - ▶ 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
  - 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
  - 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
  - Download file names:
    - 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
  - 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

  - Please list which steps you took and where you get an error / problem.

  - Include the error message you get within the email!

# 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
  - 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

    ▶ 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
  - 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

  - 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).

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# 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