

The ABC of Computational Text Analysis

#3 SETTING UP YOUR DEVELOPMENT ENVIRONMENT

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Outline

- research workflow 
- interacting with computers 
- installation of programs 

Recap last Lecture

- textual data is challenging
- machine-readable data

A close-up photograph of a large pile of jigsaw puzzle pieces. The pieces are of various colors, including shades of blue, yellow, orange, red, green, and brown. They are scattered across the frame, creating a textured, organic pattern. The lighting is bright, highlighting the edges and surfaces of the individual puzzle pieces.

The Zen of Organizing

Research means Organizing

How a computational approach helps

- scripts as documentation 

- efficient automation 

“don’t repeat yourself”

- less error-prone  

- reproducible 

Organizing Literature

- manage literature in one place
- generating bibliographies
- collect with a click in your browser

The screenshot shows the Zotero desktop application. On the left is a sidebar with a tree view of the user's library structure, including 'My Library' with sub-folders like 'Colonial Medicine', 'Teaching', and 'To Read'. Below this are sections for 'Group Libraries', 'Research Lab', and 'Topic Modeling'. On the right is a main panel displaying a list of academic articles. Each article entry includes a thumbnail, the title, creator, year, and a detailed info panel on the far right. The detailed info panel for the first article is visible, showing fields such as Item Type (Journal Article), Title (Circulation of Medicine in the Early Modern Atlantic World), Author (Cook, Harold J., Walker, Timothy D.), Abstract (The search for powerful drugs has caused people and commodities to move around the globe for many centuries, as it still does...), Publication (Social History of Medicine), Volume (26), Issue (3), Pages (337-351), Date (2013/08/01), Series (Series Title, Series Text), Journal Abbreviation (Soc Hist Med), Language (en), DOI (10.1093/shm/nkt013), ISSN (0951-631X), Short Title (URL https://academic.oup.com/shm/article/26/3...), Accessed (1/24/2018, 10:17:12 AM), Archive (Loc. in Archive), Library Catalog (Call Number, Rights, Extra), Date Added (1/24/2018, 10:17:12 AM), and Modified (1/24/2018, 11:50:15 AM).

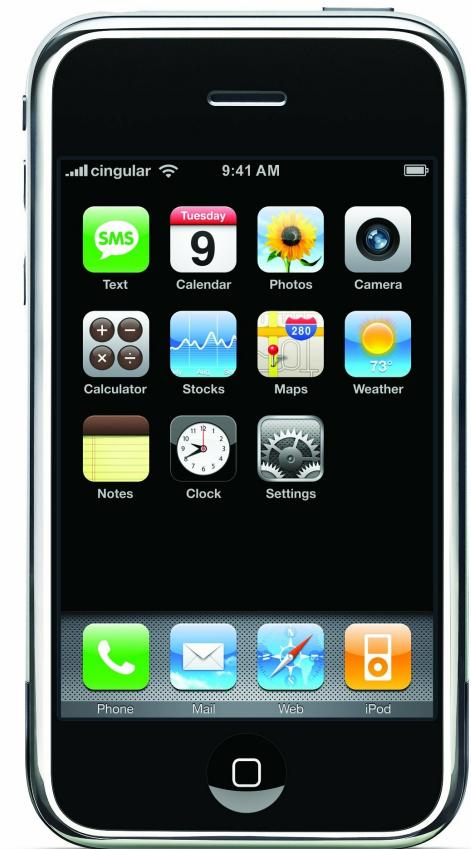
Zotero is a free, open-source software for managing scientific literature

Computers

Two Trends in Computing

- **everyday, mobile, cloud-centered, touch/click-based approach**
 - single-purpose application
 - smartphones + tablets
- **engineering, open-source, machine-oriented approach**
 - powerful due to modularity
 - workflow for data science

(see also Healy 2019)



Apple Original iPhone (2007)

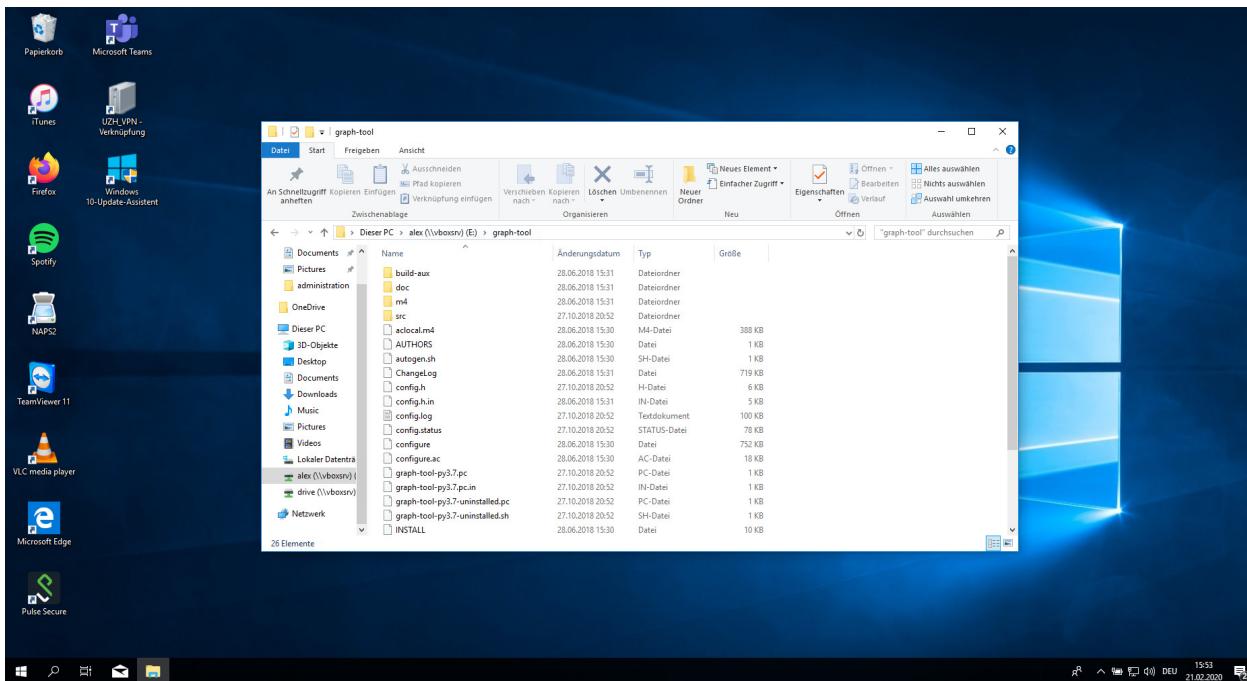
Operating Systems (OS)

Between hardware and programs

- Microsoft Windows
- macOS
- Linux-based systems 

User Interfaces

graphical user interface (GUI)



command line interface (CLI)

```
File Edit View Bookmarks Settings Help
[alex@alex-pc graph-tool]$ ls -lh
total 2.6M
-rw-r--r-- 1 alex alex 388K 28. Jun 2018 aclocal.m4
-rw-r--r-- 1 alex alex 73 28. Jun 2018 AUTHORS
-rwxr-xr-x 1 alex alex 963 28. Jun 2018 autogen.sh
drwxr-xr-x 2 alex alex 4.0K 28. Jun 2018 build-aux
-rw-r--r-- 1 alex alex 719K 28. Jun 2018 ChangeLog
-rw-r--r-- 1 alex alex 5.4K 27. Okt 2018 config.h
-rw-r--r-- 1 alex alex 4.4K 28. Jun 2018 config.h.in
-rw-r--r-- 1 alex alex 100K 27. Okt 2018 config.log
-rwxr-xr-x 1 alex alex 78K 27. Okt 2018 config.status
-rwxr-xr-x 1 alex alex 752K 28. Jun 2018 configure
drwxr-xr-x 6 alex alex 4.0K 28. Jun 2018 doc
-rw-r--r-- 1 alex alex 692 27. Okt 2018 graph-tool-py3.7.pc
-rw-r--r-- 1 alex alex 451 27. Okt 2018 graph-tool-py3.7.pc.in
-rw-r--r-- 1 alex alex 711 27. Okt 2018 graph-tool-py3.7-uninstalled.pc
-rw-r--r-- 1 alex alex 1017 27. Okt 2018 graph-tool-py3.7-uninstalled.sh
-rw-r--r-- 1 alex alex 9.3K 28. Jun 2018 INSTALL
-rwxr-xr-x 1 alex alex 344K 27. Okt 2018 libtool
-rw-r--r-- 1 alex alex 35K 28. Jun 2018 LICENSE
drwxr-xr-x 2 alex alex 4.0K 28. Jun 2018 m4
-rw-r--r-- 1 alex alex 34K 27. Okt 2018 Makefile
-rw-r--r-- 1 alex alex 1.5K 28. Jun 2018 Makefile.am
-rw-r--r-- 1 alex alex 33K 28. Jun 2018 Makefile.in
-rw-r--r-- 1 alex alex 2.5K 28. Jun 2018 README.md
drwxr-xr-x 5 alex alex 4.0K 27. Okt 2018 src
-rw-r--r-- 1 alex alex 23 27. Okt 2018 stamp-h1
[alex@alex-pc graph-tool]$
```

"An awesome Programmer saves the World"

B

Human-Machine Interaction

How to tell the computer efficiently

- text commands instead of clicks
- similar to human languages
 - syntax (form)
 - semantics (meaning)
- computers are literalists

Programming

- **command languages**
Bourne-Again shell (Bash), since 1989
- **programming languages**
Python, R, Java, C++ etc.
- **instructions → program ≡ algorithm**
cooking

Package Manager

- automation of software installation
 - system: apt, Homebrew
 - Python: pip, conda
- software dependencies
- similar to app stores

Open-Source is a Mindset

Standing on the shoulders of giants

- free + open software
- cross-platform portability
- collaboration
 - share + reuse
- helpful community

Resources everyone is using

- **Stack Overflow**
where you get answers to technical questions
- **GitHub**
where you find open software

Learning by doing, doing by Googleing.



Set up your System

Backup



You don't need it until you desperately need it!

Setting up your Development Environment

Installation

- Python 3.8
 - packages for NLP + visualization
- Tesseract
- various Bash tools
- VS Code Editor

 Follow the [installation guide](#) for your OS.

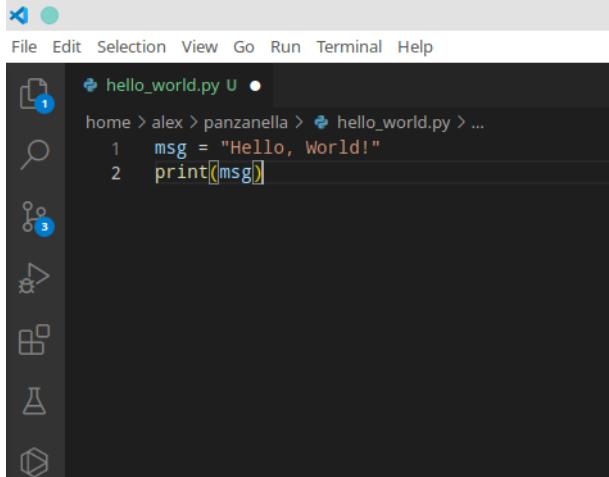


Relax.
It takes a while.

VS Code Editor

The Microsoft Word for coding

- powerful integrated development environment (IDE)
- cross-platform
- interactive analysis



A screenshot of the Visual Studio Code (VS Code) interface. The window title is 'VS Code'. The menu bar includes File, Edit, Selection, View, Go, Run, Terminal, and Help. The left sidebar shows a file tree with '1' file open, a search icon, a terminal icon with '3', and other icons. The main editor area displays a Python script named 'hello_world.py' with the following code:

```
home > alex > panzanella > hello_world.py > ...
1 msg = "Hello, World!"
2 print(msg)
```

Write your first Python script in [VS Code](#)

First Steps in Python

Learn Python with interactive tutorials

- Python Principles
- LearnPython

Readings

optional: pimp your workflow

Healy, Kieran. 2019. "The Plain Person's Guide to Plain Text Social Science." [online](#).



Questions?

References

Healy, Kieran. 2019. "The Plain Person's Guide to Plain Text Social Science."
<https://kieranhealy.org/publications/plain-person-text/>.