

Reproducible Self-Publishing via PythonT_EX

Introduction and Reference Slides

[github.com/TheChymera/RepSeP]

Horea Christian

[@TheChymera]

Institute for Biomedical Engineering, ETH and University of Zürich

2020-07-02

Publish From Code, Openly.

- ▶ Transparency → verifiability.
- ▶ Reproducibility → hackability.
- ▶ Version management support:
 - ▶ `diff`-ability.
 - ▶ `blame`-ability.

Publish in a Distributed Model, Free.

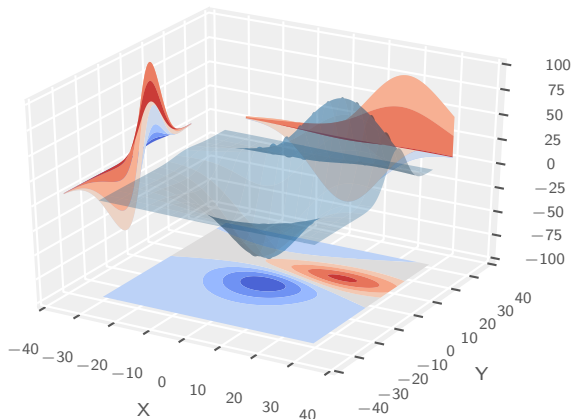
- ▶ No entry barrier → citizen science.
- ▶ No institutional bias → free science.
- ▶ *Less* publication bias → honest science.
- ▶ “Direct Market Access”.

Publish, in a Presentable Format.

- ▶ Article.
- ▶ Poster.
- ▶ Slides.

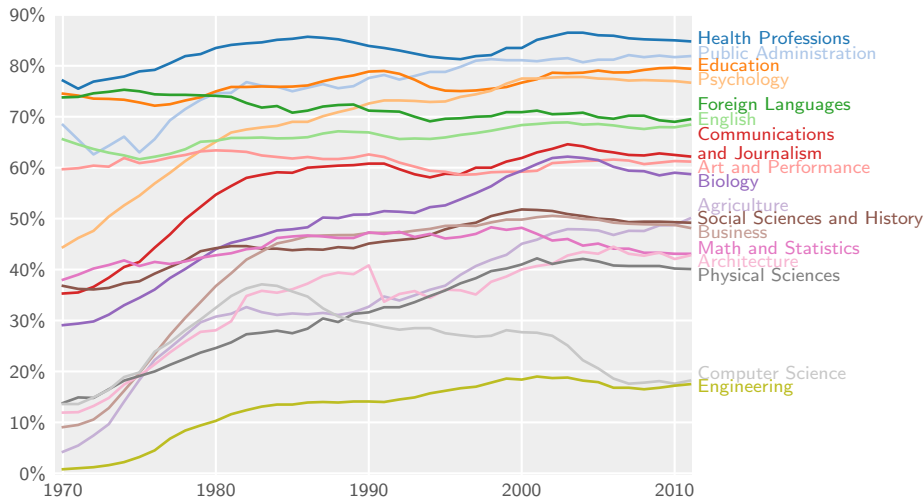


(“Notebooks” integrate poorly with both presentation and development.)



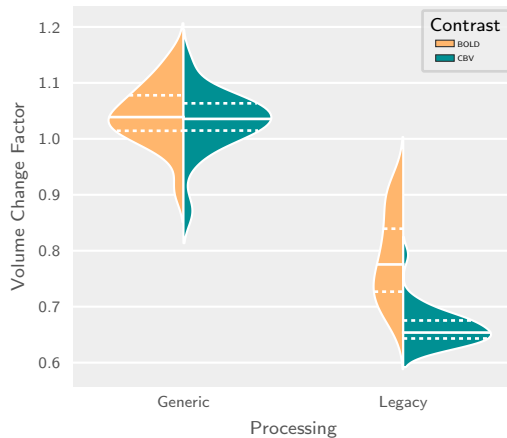
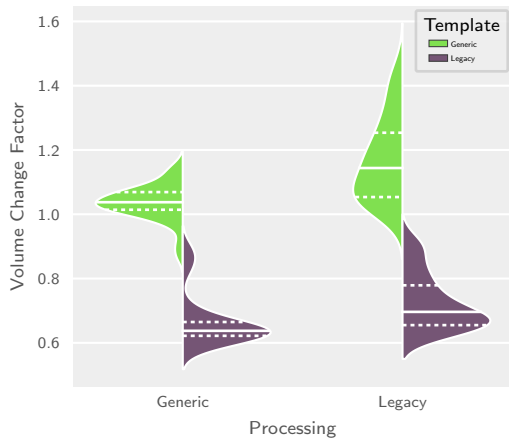
A 3D plot.

Create All Graphic Elements Directly from Source.



Percentage of Bachelor's degrees conferred to women in the U.S.A. by major (1970-2011).

And So Much More



Onset [s]	Duration [s]	Frequency [Hz]	Pulse Width [s]	Wavelength [nm]
333.05	20.0	20.0	0.005	488.0
513.05	20.0	20.0	0.005	488.0
693.05	20.0	20.0	0.005	488.0
873.05	20.0	20.0	0.005	488.0
1053.05	20.0	20.0	0.005	488.0

Table: BIDS event file table.

Sometimes Less is More

$$F_{1,268} = 10.97, p = 0.0011$$

But Sometimes You Just Want More

- ▶ Processing Factor: $F_{1,268} = 72.8$, $p = 1.07 \times 10^{-15}$
- ▶ Template Factor: $F_{1,268} = 1333$, $p = 5.13 \times 10^{-106}$
- ▶ Processing:Template Intearction: $F_{1,268} = 10.97$, $p = 0.0011$

Typesetting the Previous Radar Plot

```
\py{  
  pytex_fig('scripts/radar.py',  
    label='radar',  
    caption='A radar plot.',  
  )  
}
```

Typesetting the Previous Table

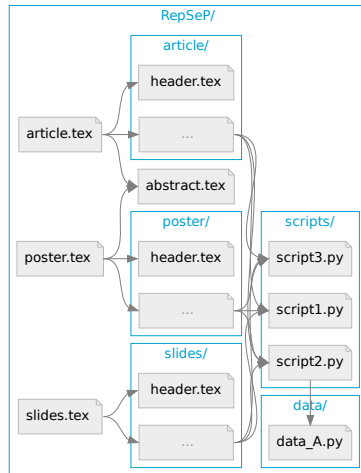
```
\py{  
  pytex_tab(  
    script='scripts/stim_table.py',  
    label='sp',  
    caption='BIDS event file table.',  
    options_pre='\\centering \\resizebox{0.5\\textwidth}{!}{',  
    data='data/JogB.tsv',  
    options_post='}',  
  )  
}
```

Typesetting the Previous Inline Statistic

```
\py{  
  pytex_printonly('scripts/drs_activityANOVA.py')  
}
```

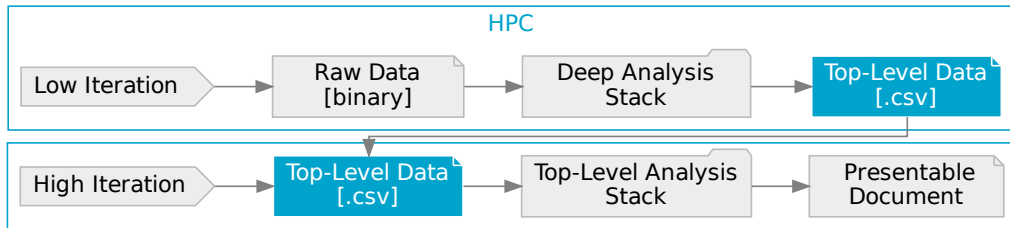
The Framework Topology

- ▶ Reduced information duplication.
- ▶ Continuous development support.



The Workflow

- ▶ Asynchronous offloading for time-consuming analysis.
- ▶ Separate packaging for deep analysis stacks.



Minimal First-Level Dependencies

```
dev-python/matplotlib  
dev-python/numpy  
dev-python/pandas  
dev-python/seaborn  
dev-python/pygments  
>=dev-python/statsmodels-0.9.0  
>=dev-tex/latex-beamer-3.41  
>=dev-tex/pythontex-0.16
```

Following the Package Manager Standard (PMS):

- ▶ Because dependency graphs should never be managed ad hoc.

Co-Author the Reference Implementation

- ▶ The `article.tex` reference document is still in early draft.
- ▶ You can contribute, fork, and publish it however you want.

Gain the Best Exposure for Your most Underexposed Work

- Pay-for-Paywall vs. “Direct Market Access”.



Gain the Best Exposure for Your most Underexposed Work

- Pay-for-Paywall vs. “Direct Market Access”.

