

open-corTeX: A continuous integration framework for open scientific communication

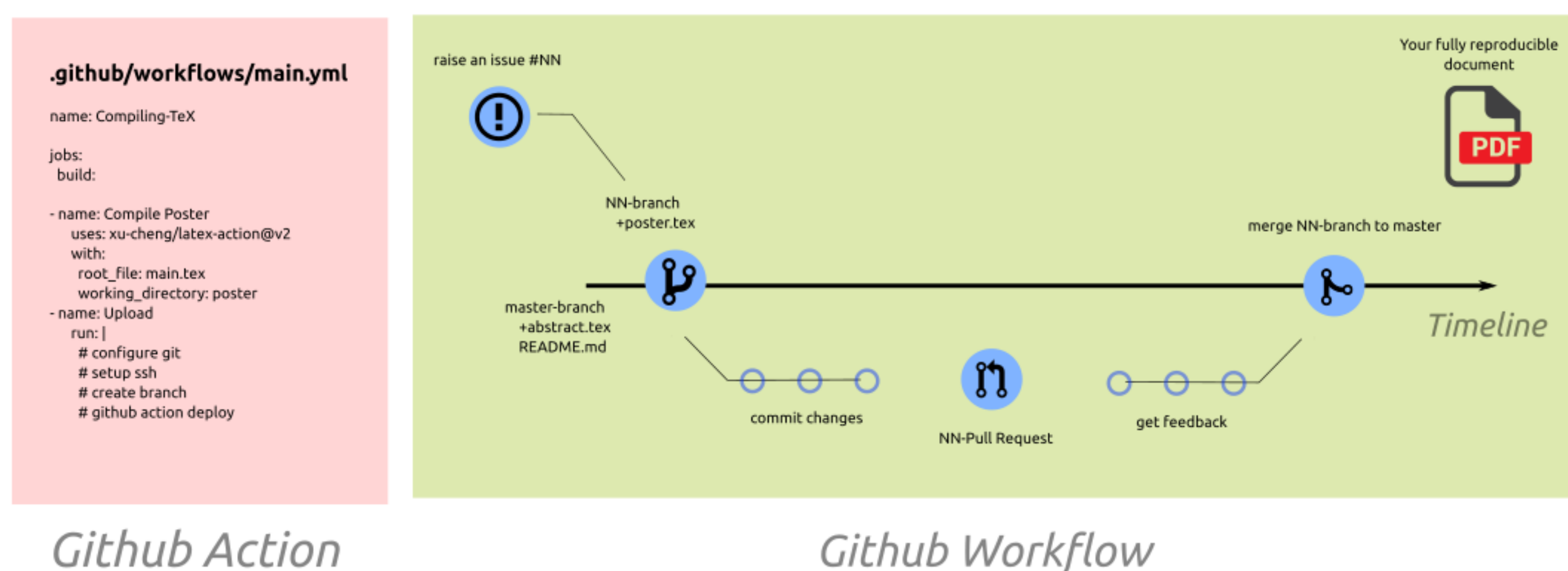
Miguel Xochicale [miguel.xochicale@kcl.ac.uk]
School of Biomedical Engineering & Imaging Sciences
King's College London, UK

Introduction

Full replication of scientific communication entails the release of code and data alongside with its documentation [1, 2, 3]. However, there are various challenges, in the current system of open scientific communication, such as the evaluation of scientific work, speed in the communication process, respect for the freedom of science and research, dissemination and accessibility, digitization, verifiability of scientific knowledge, quality, and prevention of misuse and scientific misconduct [2]. That being said, the use of continuous integration tools [4] and containers [5] is a starting point to tackle few of the previous challenges.

open-corTeX

open-corTeX is a proof-of-concept framework for open scientific communication and it is based on continuous integration (CI) of LaTeX documents by Luger and Foreman-Mackey 2019 [4] and Github actions running docker images of full TeXlive, a.k.a containers, by Xu 2020 [5]. Therefore, the open-corTeX framework involves two main steps: (a) the setting up of the yml file for the github action and (b) Github workflow. For the latter, user usually raises an issue, creates a branch, creates pull-request, asks for reviews and merges to master to then generate a full reproducible PDF document [6].



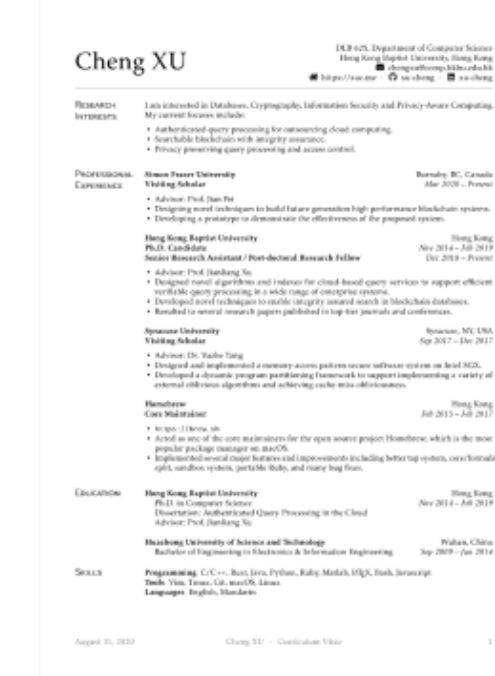
Results

LaTeX-document outputs for article, thesis, CV, poster and slides with the use of open-corTeX [6].

Article Thesis



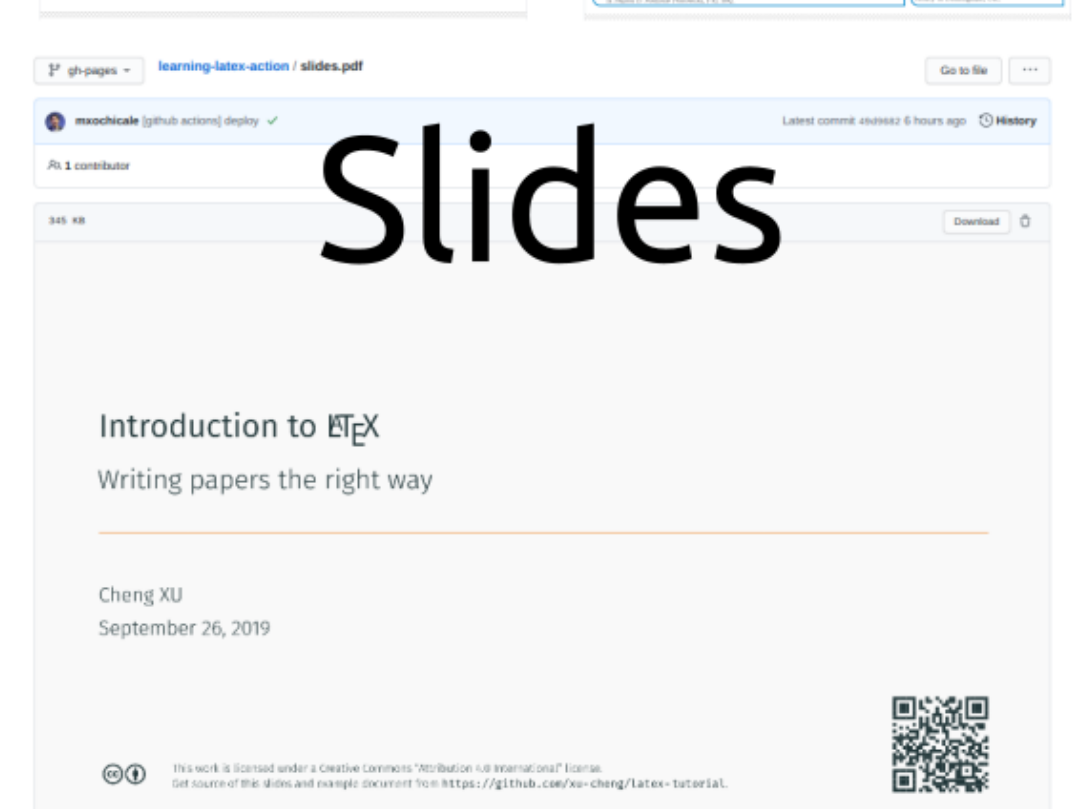
CV



Poster



Slides



Takeaways

- Tools such as CI and containers can improve reproducibility because of their portability and lightweight to produce the same output without regard to the operational system.
- The adoption of open-corTeX might lead to scientific outcomes that are aligned to the principles of reproducibility, inclusiveness, transparency, reusability and open accessibility.

References

- [1] Peng Roger D. Reproducible Research in Computational Science. In *Science* 334.6060 (2011), doi: 10.1126/science.1213847
- [2] Heise Christian and Pearce Joshua M. From Open Access to Open Science: The Path From Scientific Reality to Open Scientific Communication. In *SAGE Open* 10.2 (2020), doi: 10.1177/2158244020915900
- [3] Xochicale Miguel. Github repository for PhD thesis. Sep. 2019. doi: 10.5281/zenodo.3384281
- [4] Luger Rodrigo and Foreman-Mackey Daniel. Continuously-integrated Open-source Reproducible TeX. <https://github.com/rodluger/cortex>.
- [5] Xu Cheng. GitHub Action to compile LaTeX documents. May 2020. <https://github.com/xu-cheng/latex-action>.
- [6] Xochicale Miguel. open-corTeX: A framework for open-accessible continuous integration for scientific communication Github repository. Sep. 2020. <https://github.com/mxochicale/rts2020>.