Special Issue: The Potential of Notebooks for Scientific Publication, Reproducibility and Dissemination

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Background

Software development and improved web browser technology have enable exciting and fast-moving developments in many areas of research. Computational notebooks, particularly Jupyter Notebooks represent a major advance for scientific research. A Jupyter Notebook is an open-source web application which enables to create and share documents containing live code, equations, visualisations and narrative text (Jupyter Project, 2019). A Jupyter notebook comprises a series of `cells' containing executable code, or markdown, along with the popular HTML markup language for prose descriptions and LaTeX for mathematical equation write up. Jupyter Notebooks have enabled a new type of programming which emphasises a prose first approach where exposition with human-friendly text is punctuated with code blocks. The Jupyter Notebook was originally developed by Fernando Perez and Brian Granger in the Python programme language in 2011 and known as IPython Notebooks. In 2013, the technology was expanded to allow for additional programming languages and renamed `Jupyter'. `Jupyter' is an acronym for Julia, Python and R.

The interactive and narrative nature of computational notebooks provides unique opportunities for sharing computational research, enabling reproducibility and publishing scientific research. This is particularly important at a time when the scale and complexity of scientific studies grow, and replicability and reproducibility of scientific research has gained salience (Peng, 2011). Often code, data, documentation and results are stored in separate files. Computational notebooks allow to conduct analyses and integrate code, specialised software, dependencies, results and descriptive text into a single `computational narrative' to be share, read and executed by others (Pérez and Granger, 2015; Kluyver *et al.*, 2016). Attracted by the ability to combine executable code and descriptive text in a single document, an increasingly large community of researchers have adopted computational notebooks to document, publish and share their research via personal websites and GitHub (Parente, 2019).

Yet publishers have not embraced this technology. We believe that there are great benefits for the scientific community from publishing computational notebooks. The publication of computational notebooks, along with articles, enables reproducibility and replicability of data analysis and methods. Computational notebooks also a valuable vehicle for teaching and demonstration of analytical tools. Computational notebooks can also augment the impact of research beyond its primary objectives by extending original analysis and by reaching non-academic communities. The interactivity of notebooks can engage policy makers and the general public in ways that standard academic journal publications cannot. Engaging users can identify local relevant patterns or identify uses that may not be reported or explicitly singled out in academic articles.

In view of these potentials, REGION officially announces a new form of publication, computational notebooks. We will publish computational notebooks in three formats: R or Python notebook file extensions, HTML and pdf. Unlike the pdf format, R or Python notebook file and HTML file extensions will provide an interactive version of the code which can be fully reproduced. Two options will be available to published computation notebooks: (1) as a companion to a research article, or (2) as standalone piece in our Resource section. By publishing computational notebooks, we hope to encourage appropriate recognition of the work dedicated to this form of document. Normally the use of computer code published on personal websites or GitHub does not receive any sort of recognition given unfamiliarity with this form of publication or lack of a referenceable identifier. Computational notebooks published in REGION will received a digital object identifier (DOI) and hence will be referenceable and citable.

Aim

This Special Issue aims to introduce the publication of computational notebooks in REGION. We call for papers which illustrate the benefits of computational notebooks. We seek for papers which show how computational notebooks can be used for teaching purposes, reproducibility of analysis, exposition of methods and outreach. Submissions are required to be self-contained i.e. they must include all relevant data and dependencies for the code to be replicated. Articles should be between 2,500 and 4,000 words. We are receiving paper submissions via our online submission system. If you are submitting a paper for the Special Issue, select "Special Issue The Potential of Notebooks for Scientific Publication, Reproducibility and Dissemination" from the `Section' dropdown menu.

Deadline: 18th October, 2019

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