Wageningen, Tuesday 9 May 2017

http://www.agile-online.org/index.php/conference/conference-2017

1. Workshop name/title (and acronym is applicable)

Reproducible Computational Geosciences

2. Description of the workshop by listing topic(s), objective(s) and planned outcome(s)

2.1 Topic(s)

Reproducible research, open science, reproducibility, software   craftsmanship

2.2 Objective(s)

The workshop aims to put the topic of reproducible research on the map for AGILE conference participants and AGILE members. A primary goal is spreading the word on challenges and practices of reproducible research, more particularly the reproducibility of computational research. This will be achieved by providing newcomers a basic introduction into the topic, by participants sharing concrete examples from the GIScience domain, and by presenting existing as well as new tools for conducting research in a reproducible manner.

To disseminate the relevance of this topic, the eventual objectives are to (a) motivate participants to redistribute the workshop material in AGILE member labs, e.g. by holding a lab meeting using the provided slides (see below), (b) engage in a community-wide discussion on best practices for reproducible research in GIScience, and (c) establish the workshop format on future AGILE conferences, ideally with formal expressions of interest in the weeks after the workshop by participants of this first meeting.

2.3 Planned outcome(s)

A **report** on the workshop will be published on the website of the project Opening Reproducible Research (http://o2r.info), which will include a short summary of each talk as well as links to presentation and workshop paper.
Part of the report will be a slide deck summarizing the main points of talks and discussion,

which can be used for dissemination (see objectives).

3. Abstract

Reproducible research (RR) gains more attention each year with prominent papers, editorials and blog posts as journals, researchers and funders drive forward the agenda on open science. But still the majority of papers analyzing data, including diverse and often unique spatio-temporal observations, are not accompanied by complete materials (data, methods, complete results) to reproduce the methodology and computations, so that anyone can reproduce the findings.

In this workshop we introduce the topic in the GIScience domain with a *focus on computational reproducibility*. Contributions on the topics

- lessons learned and best practices on RR, incl. previously published examples

- reports on reproducibility studies

- challenges of RR/open science

- tools and workflows supporting computational RR

- education in RR methods

- archives and repositories

- legal aspects of RR (privacy, licenses, terms of service)

are welcome. Workshop papers (< 1000 words) must be submitted via pull request to the GitHub repository https://github.com/o2r-project/agile-2017 or daniel.nuest@uni-muenster.de. Selected papers will be invited for presentation at the workshop.

4. Short description of the intended length (half or full day) and the format of the workshop

Half day workshop (4 hours including one 30 minutes coffee break).

Agenda

- **Introduction by organisers** (10-30 mins): a summary of the intent of the workshop and the motivation for reproducible research.
  Depending on both the number and the topics of the contributions (see below), this can be extended with short information on one or more of the following topics:
  an overview of current publications (e.g. on the "reproducibility crisis"), an elaboration on the terms and definitions (e.g. replicability, pre-registration, computational reproducibility), an overview of existing frameworks and tools (e.g. repositories, literate programming, ...).

- **Invited talk** (10 minutes + 10 minutes discussion):
  The Opening Reproducible Research project and its platform for computational reproducibility in geosciences using Docker and R.

- **Talks** (1,5 hrs. with a break, talks 10 minutes each + 10 minutes discussion):
  We hope to receive external contributions to cover the topics outlined in the workshop abstract during 3-5 talks; interested participants must hand in a written workshop paper (max. 1000 words) describing the content of their talk; contributions will be invited based on scientific quality, but also to reflect the diversity of challenges and domains; submissions will be managed as text documents via GitHub using a public repository for submission, feedback, and publication.

- **Discussion** (60 mins.):
  A moderated discussion will be held after the talks. Goals of the moderation will be to steer the conversation away from the presented talks towards bigger picture issues using prepared questions; discussion rules (speaker roster, time limits) will be introduced at the beginning of the session; potential questions to start the discussion are as follows:

  - Is there a reproducibility crisis in Geographic Information Science? Will we never get one or are we just late at realizing it?

  - To what extent does GIScience need (method) reproducibility?

  - Should AGILE start to only accept reproducible research for full paper publications at the AGILE conference?

  - What is your reason to not work reproducibly, and will you change your workflow? What incentives would you need?

  - What are effective ways to foster understanding and usage of reproducibility methods in the AGILE member organisations? Prizes? Carrots or sticks?

5. Brief statement of the relevance of the workshop for AGILE

By dealing with "reproducibility of research", the proposed workshop introduces a most relevant topic to the AGILE conference. While some argue our society may enter a post-fact era, this certainly is not an option for science. But reproducibility can only be a community effort as it takes a community to create, endorse and enforce common rules and guidelines. All of these actions together can put a culture of reproducibility into practice.

Open access and open science are important top-down political drivers for change. Reproducible research supports the same goals, yet requires a bottom-up approach with usable tools and education. AGILE is a great basis to begin the development of a culture of reproducibility for GIScience and spread the knowledge and skills on conducting research in a reproducible way.

6. What is the approximate number of expected participants?

10-30

7. Names and e-mail addresses of the organizing member(s)

Leading AGILE member (or sponsor) and contact person:

Institute for Geoinformatics (ifgi), University of Münster
Daniel Nüst, daniel.nuest@uni-muenster.de

Contributing AGILE members (including the persons involved):

Faculty of Geo-Information Science and Earth Observation (ITC) of the University of Twente, Frank Ostermann

Organizing Committee:

- *Daniel Nüst (ifgi), daniel.nuest@uni-muenster.de*

- *Frank Ostermann (ITC), f.o.ostermann@utwente.nl*

- *Markus Konkol (ifgi), m.konkol@uni-muenster.de*

- *Edzer Pebesma (ifgi), edzer.pebesma@uni-muenster.de*

Programme Committee:

- Xenia van Edig (Copernicus GmbH, Germany)

- Michael Gould (Global Education Manager, esri, Redlands, USA; Geospatial Technologies Research Group, University Jaume I, Spain)

- Benedikt Gräler (52°North Initiative for Geospatial Open Source Software GmbH, Münster, Germany)

- Martin Hammitzsch (GFZ German Research Centre for Geosciences, Potsdam, Germany)

- Tomi Kauppinen (Aalto University School of Science, Finland)

- Carsten Kessler (Department of Development and Planning, Aalborg University Copenhagen, Denmark)

- Peter Löwe (German National Library of Science and Technology (TIB) – Leibniz Information Centre for Science and Technology and University Librarym - Germany)

- Victor Maus (International Institue for Applied Systems Analysis, Vienna, Austria)

- Frank Ostermann (Faculty of Geo-Information Science and Earth Observation (ITC) of the University of Twente, Netherlands)

- Anett Schibalski (Institute of Earth and Environmental Science, University of Potsdam, Germany)

- Judith Verstegen (Institute for Geoinformatics, Münster, Germany)

8. Additional information about previous workshops, if held.

n/a

9. Expected resources needed

One coffee break.

Internet connection for all participants required.

Flip chart (1 or 2) required.

10. Other information

n/a

Submission by e-mail to: Agile2017@wur.nl