

PRISM WORKSHOP ON BEST PRACTICES FOR SOFTWARE TRAINING AND WORKSHOPS

Date: Thursday, 21st May at 14:00 – 15.45

Location: Remotely via Microsoft Teams

Aim: In this workshop shared experiences and best practices on the use of workshops and tutorials for the PRISM related software. In light of the currently changes due to the Covid-19 pandemic it was also interesting to ask how our training experiences are likely to change at a broader level including all forms of remote teaching. The format of the on-line workshop involved a series of 4 short 10-minutes talks followed by small group discussions and a summary session.

PROGRAMME:

SESSION I

2.00PM-2.15PM SPENCER SHERWIN / DAVID MOXEY ON NEKTAR ++

Please referrer to the following website: <https://www.nektar.info/community/tutorials/>

Comments from the audience:

- making Nektar ++ more accessible
- Nektar ++ for Windows users not in the window environment - not tried but docker in windows should get better with the upcoming update to the Linux Subsystem ("WSL2"), which will apparently support Docker.

2.15PM-2.30PM COLIN COTTER ON FIREDRAKE / PATRICK FARRELL ON FENICS

Please referrer to the following websites: <https://firedrakeproject.org/documentation.html>

and <https://fenicsproject.org/tutorial/>

Comments from the audience:

- Delivering teaching remotely is a different thing from running MOOC-like distance-learning. What value is added by teaching live? What effort is needed to run a course without it? [can we run a Firedrake tutorial as an asynchronous MOOC-like experience?]
- There is an argument for MOOC style asynchronous style in the sense that international students doing remote learning can do it in their own time zones which is I believe a concern with current formats. A combination of synchronous and asynchronous formats could be an option without increasing the amount of work significantly?

2.30PM-2.45PM MATT PIGGOTT / GERARD GORMAN ON JUPITER NOTEBOOK

Gerard mentioned that he organised a series of lectures focused on learning to program using a language called [Python](#). So that students can purely focus on learning to program they have been using [Jupyter Notebook](#) which is a friendly "web-based interactive computational environment where students can combine code execution, text, mathematics, plots and rich media into a single document". This allows to develop and execute our programs alongside the lecture notes, instead of having to switch between the two. Further comments from Gerard included:

1. Joining a Azure Fundamentals training pilot. Leads to professional certification. First 3 weeks of June. Contact Percival, James R if you want to sign up.

2. Leaving tutorial JupyterHub running permanently (thanks Bismpas, George) <http://tutorial.devitoproject.org/> You just need a github account.
3. GitHub actions - would love to have a joined up effort on this as some of the more fancy HPC stuff requires more how to - just ask Nelson, Rhodri B. We can support anything that has to run on azure this year (cannot get GPU's etc on free GitHub tier).

For any issues with Devito's Jupyter hub, there is also a WIKI we set up for this procedure:
<https://github.com/devitocodes/devito/wiki/How-to-setup-a-JupyterHub-server-on-Azure-for-using-Devito-in-a-classroom-environment>

2.45PM-3.00PM KATERINA MICHALICKOVA ON SOFTWARE CARPENTRY.

Summary of this presentation included information on Research computing training at Imperial. This included:

1. The Research Computing and Data Science Programme at the Graduate School:

 - short (3-6 hours) hands-on courses in ~20 topics in research computing and data science
 - ~3K places/year; primarily for PhDs, 20% allocated for non-PhDs
 - Christopher Cooling (GS), John Pinney (GS), Katerina Michalickova (GS), Adam Townsend (Math), RSE group (RCS), GTAs
 - <https://www.imperial.ac.uk/study/pg/graduate-school/students/doctoral/professionaldevelopment/research-computing-data-science/courses/>

2. Software Carpentry workshops:

- since February 2018, 17 workshops and 3 instructor training sessions
- ~40 wonderful volunteers at Imperial
- <https://wiki.imperial.ac.uk/display/HPC/Imperial+Software+Carpentry+Initiative>

Furthermore, Katarina described Software Carpentry (software-carpentry.org) as an international volunteer organisation dedicated to teaching basic computing skills to researchers. Any local community can participate, the idea is to self-organise with the Carpentry's support:

- SC workshop blueprint
- centrally managed teaching materials
- instructor training
- opportunities for networking.

Structure of Software Carpentry workshops: usually 2 days split into 4 sessions, each session has one instructor and ~2 assistants up to 30 participants from different backgrounds locally, we use two variants:

- research computing with Python, bash and git
- data science with R

teaching is entirely based on live coding and hands-on exercises it is preferred that participants install all software on their own laptop prior to the workshop.

Teaching materials:

- Teaching materials are maintained centrally by SC in GitHub repos
- Markdown files with lots of detail and exercises (suitable for self-study)
- Repos can be forked and adapted for local use

3. I-STEMM undergraduate module (spring 2021):

- the Graduate School team + Adam Townsend and Jeremy Cohen (DoC)

Katarina also described **productive learning environment** which includes:

- instructors are trained to watch their expert blind spots and an accidental use of dismissive language (e.g., “it is easy, you just do ...”)
- code of conduct – apart from the obvious content, the code also covers critical remarks about choice of operating system or editor
- clear communication with a system of red and green post-its - red to get help and green to signal that all is ok
- when live coding, instructors state out loud all they type and never copy/paste
- multiple modes of communication to encourage participation (questions, post-its, shared document)

Going remote: so far, we have organised two remote workshops at ICL (March 26-27 and May 4, 11):

- each workshop involved 8 volunteers and ~30 participants
- one Zoom meeting per session
- one host, one instructor and two assistants per session

Software Carpentry has been training instructors via Zoom for several years; having a bit of prior exposure was invaluable. The SC community collective experience with remote teaching:

<https://carpentries.org/blog/2020/03/tips-for-teaching-online/>

Remote workshop roles: Role-centric guidelines proved very helpful to coordinate multiple volunteer instructors and assistants. In a nutshell:

- Instructor – videos (if possible), teaching, fielding questions, communication prompts
- Assistants – fielding questions, troubleshooting and feedback to instructor, request breakout room if needed
- Host – meeting administration, technical instructions to participants, coordination of instructors and assistants, breakout room and polls management

Live teaching or videos? If feasible, use of pre-recorded videos is recommended for remote workshops:

- participants have a full control over the pace
- more manageable if connection is poor
- can be reused for subsequent workshops and posted in a e-learning resource
- captions can be generated to increase accessibility and to mitigate language difficulties
- schedule hands-on exercises to synchronise the audience after viewing a video

Audience participation: Biggest challenge in remote workshops – participation from the audience tends to be lower than in face-to-face workshops. Their workshops offer multiple communication channels - voice, chat, raised hand, green/red flags, polls, shared document. They frequently (more so than in a in-class workshop) encourage people to use them. Non-verbal communication channels have a good uptake, voice tends to be dominated by a few people

Katerina has also interesting things to say about prompting students to reflect on their learning and how it might be improved:

<https://www.imperial.ac.uk/admin-services/ict/self-service/teaching-learning/mentimeter/>

SESSION II

3.00PM-3.30PM BRAINSTORMING SESSIONS ON ESTABLISHING BEST PRACTICES.

Discussion topics included:

Group 1 What works well in existing tutorials and why?

Group 2 How to deal with new reality and what needs to be changed in order deliver online courses?

Group 3 How to tailor tutorials to different groups (research or industry environment)?

SESSION III

3.30PM-3.45PM WRAP-UP SESSION (ALL PRESENT)

Group Leaders reported the following findings after the networking session:

FEEDBACK TOPIC: WHAT WORKS WELL IN EXISTING TUTORIALS AND WHY?

1. Keeping an effective communication is an issue.
2. Different teaching modes can be confusing for students
3. Moderator on the chat is useful to respond to queries
4. Cautious students should have a chance to engage (using google docs maybe a problem)
5. Coding exercise - provide feedback in real time in a way that other students cannot hear it e.g. by collecting google forms
6. Tools that can be used for tutorials: Microsoft lens or taking photos
7. Unsynchronised communication is a problem.
8. Using discussions or chats can be helpful.
9. Mentor type framework can be also used (more relatable for the students)
10. Airs sketch pro can be useful for questions.

FEEDBACK TOPIC: HOW TO DEAL WITH NEW REALITY AND WHAT NEEDS TO BE CHANGED IN ORDER DELIVER ONLINE COURSES?

Remote teaching challenges:

- how are cohorts going to be built if people can only see each other via remote systems?
- Pastoral aspects
- Technology: Exists but experience is not there.
- Engagement, audience participation are major challenges in online workshops - pedagogy aspects are important.
- For workshops: a list of online webinars does not make a workshop.
- Training: can reduce content but for formal teaching, needs to go through committees, etc.
- Constraints for formal teaching: What can be delivered online is different to in-person - volume of material - slower online. Need to look at what technology you have available
- Pedagogy aspects: Value of answering a student's question and overhearing it - willingness to engage in an online environment versus in class or in an event.
Managing questions in large groups, lectures, etc. Interaction issues - having GTAs/assistants in class is great for providing assistance but it's only beneficial to the individual asking the question (and perhaps their neighbours). With an online approach, everyone can take advantage of the answers to questions published via an online forum/chat etc.
- Integration between technologies - how they all fit together, compliance with security issues, GDPR, etc. Microsoft Lens mentioned as a potentially valuable tool.
- Regarding building a cohort, check out the Virtual World project by Thomas Clarke - [Thomas's Teams site here](#).

FEEDBACK TOPIC: HOW TO TAILOR TUTORIALS TO DIFFERENT GROUPS (RESEARCH OR INDUSTRY ENVIRONMENT)?

- Transition to on-line teaching
- Providing teaching materials to different audiences/users/.
- Providing more focused material to participants with different skills sets.
- It is interesting to consider what soft outcomes of "in-person" tutorials would be missing from an online event - particularly if async.

LIST OF ATTENDEES

First Name	Surname
Anna	Radomska
Spencer	Sherwin
Group 1	
Colin	Cotter
Reuben	Hill
Moulay Hicham	Tber
Alberto	Paganini
Ganlin	Lyu
Gianmarco	Mengaldo
Filipe	Buscariolo
Yu	Pan
Lawrence	Mitchell
Róisín	Hill
Hiroe	Yamazaki
James	Slaughter
Group 2	
Jeremy	Cohen
Patrick	Farrell
Jemma	Shipton
Ankang	Gao
Zhenguo	Yan
Mohsen	Lahooti
Mohammad Zakir	Hossain
walid	hamibli

Matthew	Knepley
Gerald	Gorman
Katerina	Michalickova
Aoife	Hill
Group 3	
Dave	Moxey
Jan	Eichstaedt
Andrea	Cassinelli
yan	Zhang
Robin	Basso
Ganwei	Wang
joaquim	peiro
Christopher	Cave-Ayland
Matt	Piggott
Niall	Madden
Ken	Morgan
James	Percival
Paul	Kelly
Gianmarco	Mengaldo