SC23 tutorial proposal: Strategies for teaching computational subjects in large-scale online/hybrid environments

Samantha Wittke and Radovan Bast

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1 Abstract

In 2020, most courses and training projects transitioned from in-person to online teaching. However, many attempted to use in-person strategies online. CodeRefinery started this way, but soon scaled up and developed a new model of online teaching. This model combines live-streaming, co-teaching, parallelized and threaded questions and answers, and parallel in-person events followed via stream. This strategy has been applied to teaching events with over 500 registered participants. It requires not only adjusted technology but also an adjusted mindset for the course's purpose and outcome.

During this tutorial session, we will share our strategy and lessons learned, and discuss how they can also benefit the HPC community. We will demonstrate live how an interactive stream workshop functions by providing part of the workshop via a stream and providing interaction for everyone via a collaborative document. As a full hands-on activity, we will work with participants to set up an optimal screen-share and encourage them to share their experiences. At the end of the session, we will demonstrate how we archive the tutorial outcomes and make them publicly available.

Our main goal for this tutorial is to improve the online training experience, both for large and small-size workshops.

2 Detailed description of the proposed tutorial

2.1 Tutorial goals

We will attempt to showcase one way of how the future of online teaching could look and show and tell about our strategies and tools that helped to develop a successful teaching strategy with which we can provide interactive workshops with over 300 participants at the same time. While from the organizers perspective the workshops are held online, participants can get an in-person experience without the organizational burden of organizing an in-person event. We are convinced that the lessons learned are valuable also for smaller events of 20-30 participants or more.

2.2 Relevance for conference attendees

Due to the pandemic, almost everyone had to shift from in-person to online teaching and adapt their methods, including the HPC community. This tutorial will allow people who faced this challenge to come together and share experiences and lessons learned, strengthening their skills for remote teaching. The strategies and tools utilized in this tutorial can also be applied to other circumstances, such as mentoring, meetings, and presentations.

2.3 Target audience

The target audience for this tutorial are teachers of technical courses and workshops (computation and/or programming), who are interested in novel ways of hybrid/online teaching. However, also researchers/students/developers/research software engineers belong to the target audience to learn about presentation strategies and new ways of sharing materials online and learn about existing materials on the topic.

2.4 Content level

This tutorial provides content for everyone: from beginners in teaching to experienced teachers. Also participants that do not do any teaching are expected to learn something new that can be applied to presentations about computational topics as well.

2.5 Audience prerequisites

There are no technical requirements for the tutorial. Participants will get the best experience if they can bring a laptop with a web browser and terminal. The actual implementation and functionality of the terminal and which software is available through it, will not be important.

2.6 Tutorial content

This tutorial is proposed for half a day. The schedule is planned as follows:

- Introduction (20-30 min)
- Presentation: We join a stream session as team (45 min) and follow a presentation on "The future of teaching"
- Demo/hands-on: Setting up a high-quality screen share (45 min)
- Break (30 min)
- Presentation: Preparing a workshop and teaching (45 min)
- Discussion: Q&A and next steps (45 min)

2.7 Cohesion measures

All presenters have been teaching in cross-national and cross-organizational contexts together before. Part of this tutorial is the demonstration of co-teaching technique which has been proven to work very well in CodeRefinery workshops, which means that no one ever teaches alone, but there is always at least 2 people having a discussion rather than one person presenting. This ensures an entertaining atmosphere. We will also provide all the materials on a common website which will be made available under a reusable open-source license. We will avoid separate and disconnected slide decks.

2.8 Previous editions and updates

Shorter version of this tutorial have been presented earlier:

- CarpentryCon 2022: Online teaching strategies from CodeRefinery (Aug 3, 2022)
- Community teaching mini-workshop 2022 (Jun 21, 2022; online)
- Panel session at CarpentryCon 2020: Mega CodeRefinery online workshop - How to scale up online workshop to reach 100 learners? (YouTube video of the session)

Planned updates for SC23: Update the presentation material with our lessons learned from 2022 and 2023 workshops and with changes from our operational manuals.

3 Detailed outline of the tutorial

- Introduction (20-30 min)
  - Introduce presenters
  - About the CodeRefinery project
  - Why do we suggest this tutorial?
  - Available CodeRefinery lesson material, exercises, and target groups
- We join a stream session as team (45 min)
  - Short version of "The future of teaching" presentation about why we need to change the way we teach
  - Screen share and co-teaching is demonstrated
  - The tutorial participants experience this session as remote-hybrid team (we demonstrate in-person team participation like during a CodeRefinery workshop)
  - We all interact and influence via collaborative notes
- Setting up a high-quality screen share (45 min)
  - Demonstration according to https://coderefinery.github.io/community-teaching/instructor-tech-setup/
    - Arranging windows/terminals
    - Sharing command history
    - Colors and contrast
    - How we test it
  - Audience participation
    - Set up your screen-share and terminal setup share with others
    - Share tricks and best practices
- Break (30 min)
- Preparing a workshop and teaching (45 min)
  - Lesson preparation
  - Co-teaching
  - Cross-organizational co-organization best practices
- Q&A and next steps (45 min)
  - Buffer and Q&A
  - How you can join and co-organize with us
  - We publish the anonymized Q&A notes together as demonstration

4 Hands-on feasibility check/analysis

Participants will be able to shape parts of the tutorial by collaborating with presenters in room and online through a collaborative document which we will use for questions, notes, and live feedback. During the tutorial every participant will get the opportunity to discuss and set up an optimal screen share for online teaching with materials, command line, and collaborative document.

5 Curriculum Vitae for each presenter

(here insert CV)

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6 Statement agreeing to release the notes for the SC23 tutorial digital copy

If accepted, we agree to release the notes for the SC23 tutorial digital copy.