WOIV'20:
5th International Workshop on In Situ Visualization

1   Abstract

The ever increasing scale of today's HPC simulations with their inherent I/O bottleneck makes *in situ* an essential approach for data analysis. Nowadays, the rate of data generation significantly exceeds the available bandwidth of storage capabilities. Consequently, analysis and visualization have to be coupled *in situ* to a live simulation to facilitate comprehensive investigation. In doing so, data abstracts are generated that capture much more information than otherwise possible.

The "International Workshop on In Situ Visualization" provides a venue for speakers to share practical expertise and experience with in situ visualization approaches. We encourage contributed talks on methods and workflows that have been applied in this field. Speakers should detail if and how the application drove abstractions or other kinds of data reductions and how these interacted with the expressiveness and flexibility of the visualization for exploratory analysis. As in the previous years, for this 5th edition of the workshop, we also strongly encourage submissions on approaches that either did not work at all or did not live up to their expectations. We therefore expect to get first-hand reports on lessons learned and pitfalls to be avoided.

Our goal is to appeal to a wide-ranging audience of computational scientists, visualization scientists, and simulation developers, who

closely collaborate in order to develop, deploy, and maintain in situ visualization approaches on HPC infrastructures. We hope to provide practical take-away techniques and insights that serve as inspiration for attendees to implement or refine in their own HPC environments and to avoid pitfalls.

Keywords: Visualization; Simulation; In situ; Massively parallel

2   Previous Workshops

Previous iterations of the proposed workshop have been held successfully as half-day workshops in 2016 and 2017, and as full-day workshops in 2018 and 2019 with an attendance of around 50 people each. The speakers were given the possibility to fast-track an extended version of their talk as a submission to Supercomputing Frontiers. In 2016, four were published and included in Volume 3, Number 4 (2016) `http://superfri.org/superfri/issue/view/12/showToc`. In 2017, because of the tighter schedule, only three were published in Volume 4, number 3 (2017) `http://superfri.org/superfri/issue/view/15/showToc`. In addition, in 2017 another half-day workshop of similar scope "Visualization at Scale: Deployment Case Studies & Experience Reports" with around 30 attendees was organized.

In 2018, we merged the two half-day workshops into one full-day workshop. Furthermore, we changed the organizational structure to take advantage of the ISC review cycle and publishing procedure through the Springer Lecture Notes in Computer Science (LNCS) series. The papers of the 2018 iteration appeared as part of the ISC High Performance 2018 International Workshops post-conference proceedings (LNCS 11203, DOI: 10.1007/978-3-030-02465-9), the papers of the 2019 iteration will appear as part of the ISC High performance 2019 International Workshops post-conference proceedings (LNCS 11887, `https://doi.org/10.1007/978-3-030-34356-9`) in January 2020.

In 2020, we will maintain this overall structure and procedure from the previous year. In addition, we will streamline the information for authors for submitting papers and the publication procedure.

3 Format and Schedule

The workshop will again be full-day, 9am – 6pm. It will feature two invited speakers (50 minutes, each) and 8 paper talks (20 minutes, each) selected using the ISC submission system. We want to especially foster a dialogue between visualization researchers and HPC practitioners. Thus, after each invited talk and paper talk we are planning for 10 minutes of questions and discussions. Furthermore, we will invite simulation code developers together with in-situ visualization developers for a panel discussion at the end of the workshop (one hour, four panelists).

- 09:00 – 11:00: Keynote A
  2 paper talks
- 11:00 – 11:30: coffee break
- 11:30 – 13:00: 3 paper talks
- 13:00 – 14:00: lunch break
- 14:00 – 16:00: Keynote B
  2 paper talks
- 16:00 – 16:30: coffee break
- 16:30 – 18:00: 1 paper talk
  Panel discussion with simulation code developers

4 Keynote Speaker(s)

Andrew C. Bauer, United States Department of Defense (formerly: Kitware Inc.) has agreed to deliver one of the keynote talks.
Candidates for the other keynote speaker of the 2020 workshop are

- Chris Johnson / Chuck Hansen, University of Utah, USA
- E. Wes Bethel, Lawrence Berkeley National Lab, USA
- Mike Papka, Argonne National Lab, USA
- Katrin Heitmann, Argonne National Lab, USA
- Matt Larsen, Lawrence Livermore National Lab, USA

- Jacqueline Chen, Sandia National Laboratories, USA
- Ewa Deelman, University of Southern California, USA

5 Organization Committee

5.1 Workshop Chairs

- Niklas Röber, Deutsches Klimarechenzentrum GmbH, Germany
- Tom Vierjahn, Westphalian Univ. of Applied Sciences, Germany

5.2 Co-Organizers

- Steffen Frey, University of Stuttgart, Germany
- Kenneth Moreland, Sandia National Laboratories, USA
- Guido Reina, University of Stuttgart, Germany
- Thomas Theußl, KAUST, Saudi Arabia

5.3 Program Committee (tentative)

- Bartosz Borucki, University of Warsaw, Poland
- Hadrien Calmet, Barcelona Supercomputing Center, Spain
- Hank Childs, University of Oregon, USA
- Jens Henrik Göbbert, Forschungszentrum Jülich GmbH, Germany
- Bernd Hentschel, d.velop AG, Germany
- Glendon Holst, KAUST, Saudi Arabia
- Julien Jomier, Kitware, France
- Joanna Leng, University of Leeds, United Kingdom
- Benson Muite, University of Tartu, Estonia
- Joachim Pouderoux, Kitware, France
- Gunther Weber, Lawrence Berkeley National Lab, USA

- Ahmed Zawawi, Saudi Aramco, Saudi Arabia

More will be appointed.

6   Scope, Relevance, and Impact of the Workshop

The workshop is geared towards researchers, scientists, visual analysts, and software developers who use, deploy, or maintain simulation codes that require or already employ in situ visualization approaches on HPC infrastructures, as well as visualization researchers. The targeted audience are those who seek performance throughout the entire simulation process. Contributions will report on approaches that worked and those that failed, highlighting existing or potential bottlenecks and investigate how these might be overcome in real use cases. Of particular interest are parallel simulation frameworks, tool chains, and their scalability.

7   Estimated attendance

Between 30–50 people.

8   Expected Outcome From the Workshop

The workshop gives supercomputing experts, visualization experts, and domain scientists the opportunity to submit their work and discuss their approaches to in situ visualization. This should foster interdisciplinary exchange. The proceedings will be published as part of the Springer Lecture Notes in Computer Science (LNCS) series. The discussion among speakers, panelists, and audience might trigger some joint effort to write a perspectives paper for inclusion in the post-workshop proceedings.

9 Strategies For Advertising and Attracting Attendees

We are targeting three groups of attendees: simulation, visualization, and supercomputing practitioners and experts. In addition to the personal contact of the committee members, we plan to advertise this workshop through the following community channels:

- IEEE VIS mailing list
- IEEE Supercomputing mailing list
- mailing lists of the supercomputing and simulation communities (e.g., HPCWire, insideHPC, DOECGF)
- ParaView and VisIt mailing lists
- contact previous attendees directly

In addition to emails, we will use twitter and other social media channels. Finally, this 5th edition of the workshop will have its own website at the same URL as the previous ones `https://woiv.gitlab.io`.