

# Automated Workflow Composition in the Life Sciences

March 9-13, 2020, Lorentz Center@Oort

## Scientific

The workshop brought together participants from different scientific fields and communities to acquire a common level of knowledge on automated workflow composition, and to identify a joint research agenda for the coming years. This was achieved through a combination of broad keynotes, detailed technical presentations, thematic breakouts and hackathons to challenge the practical usability of key concepts in real life science scenarios.

Carole Goble, Professor of Computer Science at the University of Manchester and long-time champion of scientific workflows, kicked off the workshop with a keynote on "Workflow Wandering and Wondering". This was followed by short presentations from six domain experts and an inspirational talk about the practical application of ontologies by Professor Robert Stevens. Over the course of the next three days, the participants discussed the state of the art and ongoing development in life science ontologies, semantics and functional tool annotations, different approaches to automated composition of computational workflows, and workflow comparison and benchmarking techniques.

Discussions were lively and constructive, with the challenges analyzed from a wide range of scientific and technical angles. Evening hackathons resulted in improved tool annotations and new collaborations which started with actual progress toward common goals and the alignment of previously separate efforts.

Participants acquired a common level of knowledge about the workshop topic and as the event progressed, arrived at a common understanding of the challenges and possible approaches to overcome them. Thus, they were primed to join forces and advance the field together. The workshop culminated in a research agenda and community actions for the years to come. Finally, Tobias Kuhn from the VU in Amsterdam sent everyone off with an inspirational keynote talk on "Making workflows FAIR with nanopublications".

The workshop clarified concepts such as the disambiguation between pipelines and workflows, and between abstract and executable workflows. The workshop helped define the scope and initiate the planning of future automated composition projects ranging from individual student projects and low-hanging fruit, such as converters between different workflow formats, to more ambitious community efforts. The bio.tools registry and EDAM ontology were identified as enabling technologies for workflow comparison and composition.

Many participants expressed they enjoyed and learned a lot from the workshop, including the organizers!

## Organization

In total, 36 researchers from 10 countries gathered in Leiden to participate in the workshop. An opening keynote and introductions of participants and life science domains on Monday was followed by three days of morning lectures and afternoon breakouts, each day with a distinct theme. The Tuesday and Thursday evening hackathons were well-attended and productive.

The Lorentz Center provided valuable and professional support before, throughout and after the workshop. The friendly staff were always on hand to help participants and organizers with matters small and large. The participants who could not travel to Leiden or had to leave early due to raising travel restrictions could follow the presentations via a Zoom link provided by the Center and thus actively participated in the discussions.

The organizers would like to thank the Lorentz Center staff and all the participants for their hard work contributing to making our event a success!

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