July 2018

Invitation
to the IEA Wind Task 32 Workshop on
"e-WindLidar" initiative on the common lidar data format and community-based data processing tools

Date: October 3rd 2018

Venue: H.H. Koch Auditorium, DTU Risø Campus, Roskilde, Denmark
Workshop leaders: Nikola Vasiljevic (DTU Wind Energy), Tobias Klaas (Fraunhofer IEE)

Introduction to IEA Wind Task 32

The main objective of the Task 32 is to identify and mitigate barriers to the use of lidar technology in wind energy applications such as site assessment, power performance, loads & control, and complex flow. One yearly workshop is organized for each of the four applications focusing on one specific problem, and with a well-defined program and tangible outcome. More details can be found on the task website.

Background to the Workshop

The lidar community is by its nature fragmented and scattered to a large degree. There are many small or bigger groups that operate their instruments and produce data by employing their own best practices. As the result, the data are stored in various formats, and in cases when the data is accompanied with the metadata and data reports, which is rare, no particular standards or uniform templating approach is used to provide them. This has a large negative impact on the data usage and data processing efficiency.

From the perspective of data users, in case when they are willing to use lidar data from different data creators, they would need to get familiar with various storing formats and in majority of cases they will need to be in a constant communication with data creators to properly process data.

Additionally, handling datasets stored in different formats, which usually have different structures, requires development of custom code for data processing. The reusability of such code is limited.

There are numerous reasons for the present situation with lidar data, as well as with other data collected and used in the wind energy domain and elsewhere, hence, one is dominating. Until recently the roles of data creators and data users were not separated. Those who created data were the ones who used it and publish the interpretation of the processed data. This led to the situation in which data creators were selecting formats they are accustomed to, while omitting data description or not having consistent approach

in describing data since they were the same people who used those data. However, the volume of data produced today is simply impossible to be analyzed solely by the staff who created them. Therefore, the roles of those who create data and those who use data obviously became distinguishing, while at the same time there is an imposed request by the European Commission to make our data Findable, Accessible, Interoperable and Reusable (FAIR). Despite these facts the 'old' ways of dealing with data are still preserved.

Objective

This workshop will provide scientists, manufacturers, practitioners and end users of lidar data:

- A detailed overview about FAIR data principles and their application on lidar data
- An exchange of experience about the everyday challenge of handling data
- An introduction to the current status of the common lidar data model proposed by the "e-WindLidar" initiative and the possibility to actively contribute to its further development
- The possibility of testing the open-source lidar data conversion tool "lidaco" that has been developed within the e-WindLidar project and is able to convert raw data from many lidar systems to the common data format under supervision of the developing project team and describe data with meta information
- Extend the e-WindLidar working group with new members

Concept

The workshop will be a combination of:

1. Presentations from scientists on the current situation of lidar data in wind energy and approaches to overcome the above stated issues in data handling, especially focusing on FAIR data principles. The lidar data conversion tool "lidaco" that has been development within the e-WindLidar project will be introduced as well.
2. Individual and group exercises to facilitate the discussion about the need of a common data format and to get feedback for the further development of the e-WindLidar data format convention, the "lidaco" tool and the data processing toolbox
3. Group work in which participants can try out "lidaco" for their own data sets under support of the e-WindLidar project team in order to gain user experience and illustrate its capabilities

Expected Outcome

The outcome of the workshop will be:

1. An exchange of experience in handling lidar data from different systems and for diverse applications
2. A common understanding of FAIR data principles and its application on lidar data ([draft report](#))
3. A list of feedback and suggestions from potential users of the common lidar data format "e-WindLidar" that will help to identify development steps for future versions of the convention
4. An extension of the user group of "lidaco" which will accelerate its further development and increase its impact as a tool to implement the common data format within the wind energy branch
5. The initiation of a user feedback platform for steering the further development of "lidaco" and possibly the acquisition of more people that will contribute to and/or develop extensions for "lidaco" (such as readers, writers or additional tools).
6. Workshop proceedings

Expected Participants

This workshop topic is comprehensive for all lidar applications and is oriented towards everyone that uses lidar data in their day-to-day work. Scientists, lidar manufacturers, practitioners as well as end-users (e.g. consultants) who work with any kind of lidar data (profiling lidars or scanning lidars) are expected to participate at the workshop.

Practical Arrangements

Registration

For participation in the workshop, please register online.

Please register before **September 30 2018**. Prior to the workshop, registered participants will receive additional workshop details and materials. Registration for the workshop is free of charge.

Workshop literature

It would be beneficial for participants to get familiar with the IRPWind report regarding the results of the initial phase of the e-WindLidar initiative. The report draft is available at via this link:

https://www.dropbox.com/s/6dnhyia4kd6dseb/e-WIndLidar%20draft%20report.pdf?dl=0

Venue Information

The workshop will be held at the DTU Risø Campus, H.H. Koch Auditorium, Roskilde, Denmark
Public transportation time schedules: www.rejseplanen.dk

Contact Information

Please contact Nikola Vasiljevic (niva@dtu.dk) or Tobias Klass (tobias.klaas@iee.fraunhofer.de) in case you have any questions.

Program Draft

Start	Day 1
10:00	**Welcome and introduction to the workshop (Nikola Vasiljevic & Tobias Klaas)**
10:10	**Exercise 1:** ● Individually gather your everyday challenges working with data on post-its
10:40	**Let's be FAIR: Introduction to the FAIR principles (Nikola Vasiljevic)**
11:00	**Exercise 2:** ● In groups discuss pros and cons of FAIR principles, collect your feedbacks on post-its
11:40	**Making LIDAR data FAIR (Tobias Klaas)**
12:00	**LUNCH BREAK**
13:00	**Exercise 3:** ● In groups discuss pros and cons of the presented generic format, what is missing, what needs to be improved? ● Collect your feedbacks on post-its
14:00	**Lidaco - lidar data conversion tool (Daniel Gomes & João Correia Lopes)**
14:20	**Exercise 4:** ● Hands-on with Lidaco (convert your own data set)
15:50	**COFFEE BREAK**
16:10	**e-WindLidar toolbox - towards community based tools (Nikola Vasiljevic)**
16:20	**Brainstorming next actions (Andy Clifton):** Communication, workshops, prioritization of tools development, e.g., workshop for lidar data filtering
16:50	**Wrap-up (Nikola Vasiljevic)**
17:00	**End of the workshop**