

Accelerating the Search for Dark Matter with Machine Learning

15 - 19 Jan 2018 @ Oort

Science

Description and Aims

The main objective of this workshop was to define a clear list of possible projects to boost dark matter searches with methods from the field of Machine Learning. The workshop was meant to be a kickoff meeting for a long term initiative. Projects will be collected on a webpage (www.darkmachines.org). In addition a mailing list has been created to announce projects, initiate long term discussions and collaborations and to connect the fields.

Tangible outcome

We have (so far) succeeded in all our aims. The workshop was oversubscribed and triggered an enormous amount of interests and new projects. We continued to build a new collaborative effort. We build www.darkmachines.org which currently has >70 subscribers. **Scientific breakthrough** This is the first initiative of this kind in the field dark matter research. We regard this as a scientific breakthrough on its own. We believe that the workshop might have triggered new ways to cooperate (in respect to "challenges"). Further work is needed from our side to sustain this project.

"Aha" moments

An "aha moment" for us was the realisation of the enormous prospects of Machine Learning for our field.

Organization/Format:

*How did you experience the **format of the workshop** (the structure of the program, lectures vs discussion time etc.)? Did you try something new (different kind of discussions for instance)? If so, how did it work out? Would you do it again or advise it to others?*

The organisation and setup was regarded by everybody (we spoke to) as excellent. One thing came up was that we liked to connect a speaker via video conference which was difficult (technical problems). It would also be nice to have the possibility to broadcast via videoconference one of the talks (and just one!).

Other comments, suggestions and/or criticism for the Lorentz Center, the scientific advisory boards and/or future organizers.

We had the feeling that the Lorentz does not need to be so strict and static with the program and the schedule. We used a more flexible approach on a webpage (indico).

If in the coming years, papers are published which you believe owe significantly to your workshop, please notify us. We find that highly gratifying fruits of our work and it is naturally desirable for fundraising.

We are currently write a "white paper" about the connection of dark matter and machine learning. This paper will be a result of this workshop.

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