Contribution ID: **28** Type: **not specified**

From Supervised to Unsupervised Machine Learning: lessons learned from learning machines

Monday, 30 May 2022 14:00 (50 minutes)

The amount and size of astronomical data-sets was growing rapidly in the last decades. Now, with new technologies and dedicated survey telescopes, the databases are growing even faster. VO-standards provide uniform access to this data. What is still required is a new way to analyze and tools to deal with these large data resources. E.g., common diagnostic diagrams have proven to be good tools to solve questions in the past, but they fail for millions of objects in high dimensional features spaces. Besides dealing with poly-structed and complex data, the time domain has become a new field of scientific interest.

By applying technologies from the field of computer sciences, astronomical data can be accessed more efficiently. Machine learning is a key tool to make use of the nowadays freely available datasets. This talk provides an overview of what can be achieved with supervised and unsupervised learning techniques, discussed on examples that show, what we learned when using machine learning algorithms on real astronomical data-set.

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