KSETA Doktoranden Workshop 2014



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Introduction to Boosted Decision Trees - A multivariate approach to classification problems

Wednesday, July 23, 2014 9:00 AM (1 hour)

The KSETA Doctoral Workshop allows interested KSETA fellows to learn more about methods and tools that might support their research. Doctoral students of all KSETA research fields, from theoretical or experimental particle and astroparticle physics to software or cryogenic engineering, are invited to spend three interesting and inspiring days together and to benefit from the other participants' experience.

One key aspect of the workshop are the tutorials given by all participating doctoral students. In groups, the participants prepare their tutorial "from doctoral fellows for doctoral fellows" on a topic that could be useful to others concentrating on other fields of research. This tutorial may cover introductions to useful tools, basic technologies for non-engineers, basics in physics for non-physicists, or applicable methods for research. Every tutorial lasts one hour and the presenter is free to use any didactic method like PowerPoint, whiteboard, or interactive methods such as exercises on programs installed on the students' laptops. The workshop program is complemented by invited talks and discussions.

In times of ever growing amounts of data and meta-data it is simply not possible to analyse this vast mass by hand effectively. Multivariate techniques offer an elegant way to cope with this issue and are already a common tool in complex fields like particle physics.

One is often required to sort a dataset into two groups, a so called classification. Depending on the problem these groups could be either yes or no, male or female, signal or background. Multivariate methods take advantage of internal correlations between given input variables and this classification variable to predict the likely outcome.

The focus of this session will be on Boosted Decision Trees, a powerful but nevertheless still easily understandable method for classification problems. As an introduction we will show problems and how exactly multivariate methods are able to solve them. Furthermore a demonstrative example how to approach a classification problem and how to solve it effectively using Boosted Decision Trees will be provided.

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Session Classification: Tutorials