# Machine learning methods applied to the analysis of central exclusive production events in ALICE

#### Sebastian Ratzenböck<sup>1</sup>

<sup>1</sup>Stefan Meyer Institut Österreichische Akademie der Wissenschaften

26. April 2018





# Outline

ML: an overview

2 Recap: rectangular cuts





In general ML represents a contrast to a *rule based systems* 

#### Rule-based system

System that uses rules to make deductions or choices

Domain-specific expert system





In general ML represents a contrast to a rule based systems

#### Rule-based system

System that uses rules to make deductions or choices

- Domain-specific expert system
- ullet Knowledge base: facts & rules (if o then statement)





In general ML represents a contrast to a *rule based systems* 

#### Rule-based system

System that uses rules to make deductions or choices

- Domain-specific expert system
- Knowledge base: facts & rules (if  $\rightarrow$  then statement)
- ullet Rules manually specified (by expert) o expensive, incomplete







In general ML represents a contrast to a rule based systems

#### Machine learning

• Alorithms that learn from data & make predictions on data





In general ML represents a contrast to a rule based systems

- Alorithms that learn from data & make predictions on data
- Automatic methods (no human needed)





In general ML represents a contrast to a rule based systems

- Alorithms that learn from data & make predictions on data
- Automatic methods (no human needed)
- Human work required for defining problem & assessing the data

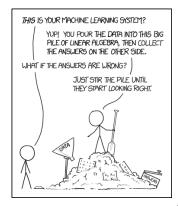




In general ML represents a contrast to a rule based systems

#### Machine learning

 Alorithms that learn from data & make predictions on data









In general ML represents a contrast to a rule based systems

- Alorithms that learn from data & make predictions on data
- Automatic methods (no human needed)









In general ML represents a contrast to a rule based systems

- Alorithms that learn from data & make predictions on data
- Automatic methods (no human needed)
- Human work required for defining problem & assessing the data

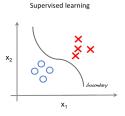


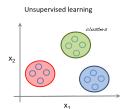




# Types of ML

- Supervised
  - Classification
  - Regression
- Unsupervised











# Rectangular cuts



