

FM 26: Introductory Talk: Machine Learning

Time: Tuesday 9:30–10:30

Location: Audi Max

Introductory Talk FM 26.1 Tue 9:30 Audi Max
Machine Learning — •KATHARINA MORIK — TU Dortmund University, Dept. Computer Science VIII, 44221 Dortmund

Machine learning is a broad field which offers far more methods than convolutional neural networks or random forests, to name the most well-known ones. Probabilistic graphical models (or information field theory) offer algorithms for estimations that are of good use for problems in physics. In addition, particular learning solutions are developed for specific problems. Machine learning aims at insights into methods that make computers learn. Properties of the methods are investigated and tight bounds of their correctness, robustness, efficiency are

sought. For this purpose, machine learning uses results of many fields: statistics is an important basis, computer architecture is another one, data bases and big data is the third and theoretical computer science is a necessary foundation. Medicine, linguistics, physics are typical sciences whose data are analysed by machine learning methods. Practical applications in mobility, manufacturing, sales, and logistics are more commercially interesting. This talk introduces into the scientific questions which are discussed in machine learning. Examples of results are shown and some applications in astrophysics are given. Given the focus of this year*s scientific programme, a link to quantum computing should not be missing.