Jérôme Bolte - On first-order algorithms and automatic differentiation in Machine Learning

The efficacy of the learning process in deep learning hinges predominantly on two elements: efficient computation of derivatives and first-order optimization methods. Derivatives indicate the incremental enhancement a neuron can achieve, while optimization algorithms channel this derivative information to guide the neurons towards a stable and effective predictive state. In this chair, we delved into these pivotal areas addressing for the first time the nonsmooth dimension of the question. This is essential to many applications such as nonsmooth backpropagation, ReLU neural networks, implicit networks, bilevel programming, differentiation of solvers, and various other facets of contemporary learning.