Talk

Integrating Algorithms into Neural Networks

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Host: Christoph Lampert

Classic algorithms and machine learning systems like neural networksare both abundant in everyday life. While classic computerscience algorithms are suitable for precise execution of exactly definedtasks such as finding the shortest path in a large graph, neuralnetworks allow learning from data to predict the most likely answer inmore complex tasks such as image classification, which cannot bereduced to an exact algorithm. In the talk, we explore combiningboth concepts leading to more robust, better performing, more interpretable,more computationally efficient, and most importantly dataefficient architectures. Using algorithmic supervision a neural network can learnfrom or in conjunction with an algorithm. When integrating an algorithminto a neural architecture, it is important that the algorithm isdifferentiable such that the architecture can be trained end-to-end andgradients can be propagated back through the algorithm in a meaningfulway. To make algorithms differentiable, I discuss a generalmethod for continuously relaxing algorithms by perturbing variableswith logistic distributions. In addition, I discuss specialized differentiablealgorithms such as differentiable sorting networks, and efficientand effective differentiable sorting and ranking operators allowingsorting and ranking supervision. Furthermore, I delve into differentiablerendering, specifically, the generalized differentiable renderer GenDR.

Thursday, March 24, 2022 03:15pm - 05:00pm
Join Zoom Meeting
https://istaustria.zoom.us/j/69657308623?pwd=MTdLS1I4T084cU43OEs3TFN2NjNHdz09
Meeting ID: 696 5730 8623 Passcode: 098438

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