



## Seminar/Talk

# Integrating Algorithms into Neural Networks

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Host: Christoph Lampert

Classic algorithms and machine learning systems like neural networks are both abundant in everyday life. While classic computer science algorithms are suitable for precise execution of exactly defined tasks such as finding the shortest path in a large graph, neural networks allow learning from data to predict the most likely answer in more complex tasks such as image classification, which cannot be reduced to an exact algorithm. In the talk, we explore combining both concepts leading to more robust, better performing, more interpretable, more computationally efficient, and most importantly data efficient architectures. Using algorithmic supervision a neural network can learn from or in conjunction with an algorithm. When integrating an algorithm into a neural architecture, it is important that the algorithm is differentiable such that the architecture can be trained end-to-end and gradients can be propagated back through the algorithm in a meaningful way. To make algorithms differentiable, I discuss a general method for continuously relaxing algorithms by perturbing variables with logistic distributions. In addition, I discuss specialized differentiable algorithms such as differentiable sorting networks, and efficient and effective differentiable sorting and ranking operators allowing sorting and ranking supervision. Furthermore, I delve into differentiable rendering, specifically, the generalized differentiable renderer GenDR.

**Thursday, March 24, 2022 03:15pm - 05:00pm**

Join Zoom Meeting

<https://istaustria.zoom.us/j/69657308623?pwd=MTdLS1I4T084cU43OE53TFN2NjNHdz09>

Meeting ID: 696 5730 8623 Passcode: 098438



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.

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