Deep Learning for Symbolic Mathematics

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Neural networks have a reputation for being better at solving statistical or approximate problems than at performing calculations or working with symbolic data. In this talk, we will show that they can be surprisingly good at more elaborated tasks in mathematics, such as symbolic integration and solving differential equations. We propose a syntax for representing mathematical problems, and methods for generating large datasets that can be used to train neural sequence-to-sequence models. We achieve results that outperform commercial Computer Algebra Systems such as Matlab or Mathematica.

Guillaume Lample is a research scientist at Facebook AI Research Paris. He obtained a PhD in machine learning from Paris 6 University in 2019. Before that, he obtained a Master's degree in natural language processing from Carnegie Mellon University in 2016, and a bachelor’s and Master’s degree in mathematics from École Polytechnique. He published in major NLP/ML conferences such as NeurIPS, ICLR, EMNLP, NAACL and AAAI, and obtained the Best Paper Award at EMNLP 2018 for his work in unsupervised machine translation. He is now working on applications of deep learning to other domains such as code generation and automated theorem proving.