DSL for ML An Annotated Bibliography

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October 8, 2025

References

[AIM17] Martín Abadi, Michael Isard, and Derek G Murray. A computational model for tensorflow: an introduction. In *Proceedings of the 1st ACM SIGPLAN International Workshop on Machine Learning and Programming Languages*, pages 1–7, 2017.

> This paper discusses how TensorFlow works under the hood, by explaining a very limited version of TensorFlow's dataflow computational model. The limited version contains variables, tensors, and read and write operations on variables. The authors explain the semantics of these operations, and how the dataflow graph behaves.

[CH93] Magnus Carlsson and Thomas Hallgren. Fudgets: A graphical user interface in a lazy functional language. In *Proceedings of the conference on Functional programming languages and computer architecture*, pages 321–330, 1993.

[CLS07] Duncan Coutts, Roman Leshchinskiy, and Don Stewart. Stream fusion: From lists to streams to nothing at all. *ACM SIGPLAN Notices*, 42(9):315–326, 2007.

> The main idea behind this paper goes back to the Deforestation paper by Philip Wadler. The idea is to eliminate intermediate lists that are created when composing functions by working on the co-structure of the list (i.e. the cons instead of the whole list). Also use GHC's rules to perform optimizations.

[IKS+18] Mike Innes, Stefan Karpinski, Viral Shah, David Barber, PLEPS Saito Stenetorp, Tim Besard, James Bradbury, Valentin Churavy, Simon Danisch, Alan Edelman, et al. On machine learning and programming languages. Association for Computing Machinery (ACM), 2018.

This paper argues that a new language for machine learning is needed. There are various arguments: libraries like TensorFlow are already languages in themselves, current languages work as meta-languages, and a new language could improve certain features.

[MLPJ13] Geoffrey Mainland, Roman Leshchinskiy, and Simon Peyton Jones. Exploiting vector instructions with generalized stream fusion. In *Proceedings of the 18th ACM SIGPLAN international conference on Functional programming*, pages 37–48, 2013.