A tensorflow backened to SpiNNaker
More precicely: a keras backend to SpiNNaker

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epcc

SpiNNaker

SpiNNaker

The project's website [Spi20] states:

[SpiNNaker is] a platform for high-performance massively parallel [and energy efficient] processing appropriate for the simulation of large-scale [spiking] neural networks [...]

Motivation

SpiNNaker as a target for training DNNs

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- Massively parallel, energy efficient and scalable systems are optimal for training NNs

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- "Easiest" way to add new tensorflow backend? XLA (`https://www.tensorflow.org/xla`)
- Instead: backend for keras (`https://keras.io`)
- Using high level conceptual graph (the actual layers of the NN) instead of low level computational graph of tensorflow

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- Writing programs for embedded hardware is hard
- Both together? ...

Overcoming them

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- Taking stimulants and don't sleep for three months

References

[Dar19] Dario Amodei, Danny Hernandez, Girish Sastry, Jack Clark, Greg Brockman, Ilya Sutskever. AI and Compute. https://openai.com/blog/ai-and-compute/, 2019.

[Mar15] Martın Abadi et al. Tensorflow: Large-Scale Machine Learning on Heterogenous Distributed Systems. http://download.tensorflow.org/paper/whitepaper2015.pdf, 2015.

[Spi20] SpiNNaker Team. SpiNNaker Project. http://apt.cs.manchester.ac.uk/projects/SpiNNaker/project/, 2020.