

# A tensorflow backened to SpiNNaker

## More precicely: a keras backend to SpiNNaker

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# SpiNNaker

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[SpiNNaker is] a platform for high-performance massively parallel [and energy efficient] processing appropriate for the simulation of large-scale [spiking] neural networks [Spi20]

# Motivation

# SpiNNaker as a target for training DNNs



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

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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

# Challenges

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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] Martín 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.