

Implementation of probabilistic Softmax for BNNs

David Warden, Khalil Sabri, and Miquel Florensa – Polytechnique Montréal, Canada

COLUMN 1 (TAGI)

COLUMN 2 (Remax)

py/cuTAGI – Open-source Bayesian deep-learning framework



github.com/lhnguyen102/cuTAGI

`pip install pytagi`

- **Performance-Oriented Kernels** written in C++/CUDA from scratch, with pybind11 for a seamless integration. It allows running on CPU & CUDA devices through a Python API.
- **Broad Architecture Support** of the basic DNN layer including *Linear*, *CNNs*, *Transposed CNNs*, *LSTM*, *Average pooling*, *Batch* and *Layer normalization*, enabling the building of mainstream architectures such as *Autoencoders*, *Transformers*, *Diffusion Models*, and *GANs*.
- **Model Building and Execution** currently supports sequential model building, with plans to introduce Eager Execution
- **Open Platform** providing access to its entire codebase.

TAGI-related references



- *Coupling LSTM Neural Networks and SSM through Analytically Tractable Inference*, (Vuong, Nguyen & Goulet, International Journal of Forecasting, 2024)
- *Analytically tractable hidden-states inference in Bayesian neural networks* (Nguyen and Goulet. Journal-to-conference track, ICLR 2024)
- *Analytically tractable heteroscedastic uncertainty quantification in Bayesian neural networks for regression tasks* (Deka, Nguyen & Goulet. Neurocomputing, 2024)
- *Tractable approximate Gaussian inference for Bayesian neural networks* (Goulet, Nguyen, & Amiri, JMLR, 2021)