Intel Loihi’s NxSDK: Introduction and Overview

Andreas Wild
03/17/2021
NICE Workshop 2021
Legal Information

Performance varies by use, configuration and other factors. Learn more at www.Intel.com/PerformanceIndex.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See backup for configuration details. No product or component can be absolutely secure.

Your costs and results may vary.

Results have been estimated or simulated.

Intel technologies may require enabled hardware, software or service activation.

Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy.

Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

© Intel Corporation. Intel, the Intel logo, and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.
NxSDK Overview

**NxNet:**
- General purpose API & compiler
- Configures neurons, connections, learning rules
- See architectural deep dive @ NICE 2019

**NxTF:**
- Specialized for deep learning
- Inherits Keras API
- Resource-efficient CNN compiler
- Supports SNN-TB or SLAYER for training
- For details see: Rueckauer et al.
  - [https://github.com/intel-nrc-ecosystem](https://github.com/intel-nrc-ecosystem)

*New Lava SW framework under development to unify NxNet, NxTF, NxCore, training frameworks (i.e. SLAYER), high level abstractions, and more!*

https://youtu.be/Bf4CskHBTOQ
Or google: “Nice 2019 presentations”
Tutorial agenda

- A fast and efficient constraint satisfaction solver on Loihi
  Gabriel Fonseca Guerra

- SLAYER for Loihi
  Sumit Bam Shrestha

- Performance characterization on Loihi
  Garrick Orchard