PRODUCT BRIEF

Intel® Neural Compute Stick 2

High performance, Low Power for AI Inference

Learn more about Intel® Neural Compute Stick 2 at **http://intel.com/ncs**

Introduction

Bringing computer vision and AI to your IoT and edge device prototypes are now easier than ever with enhanced capabilities of the Intel® Neural Compute Stick 2 (Intel® NCS2).

Whether you're developing a smart camera, a drone with gesture-recognition capabilities, an industrial robot, or the next, must-have smart home device, the Intel® NCS2 offers what you need to prototype smarter.

What looks like a standard USB thumb drive hides much more inside. It's built on the latest Intel® Movidius™ Myriad™ X VPU which features the neural compute engine—a dedicated hardware accelerator for deep neural network inferences. With more compute cores than the original version and access to the Intel® Distribution of OpenVINO™ toolkit, the Intel® NCS2 delivers 8X* performance boost over the previous generation.[1]

Product features

- Powered by Intel® Movidius™ Myriad™ X Vision Processing Unit
- Up to 8X* the performance of Intel® Movidius™ Neural Compute Stick
- Supported by the Intel® Distribution of OpenVINO™ toolkit
- Real-time, on device inference - cloud connectivity not required
- Run multiple devices on the same platform to scale performance

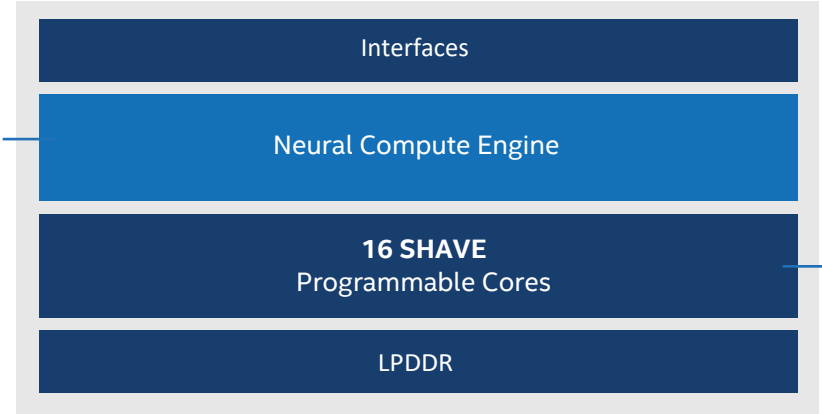
Where to buy

Purchase your Intel® Neural Compute Stick 2 from one of our trusted partners at: Where to Buy

Vision Processing Unit Architecture

Intel® Movidius™ Myriad™ X VPU

An entirely new deep neural network (DNN) inferencing engine that offers flexible interconnect and ease of configuration for on-device DNNs and computer vision applications



VLIW (DSP) programmable processors are optimized for complex visions and imaging workloads

Homogeneous memory design for low-power, UL latency, sustained High Performance

Intel® Distribution of OpenVINO™ toolkit

The Intel Distribution of OpenVINO™ toolkit is the default software development kit[1] to optimize performance, integrate deep learning inference, and run deep neural networks (DNN) on Intel® Movidius™ Vision Processing Units (VPU).

Download Open Source GitHub Repo

Computer Vision	Deep Learning
OpenCV, OpenCL™, OpenVX	Caffe*, Tensorflow*, mxnet*, ONNX*, PyTorch*, PaddlePaddle*

Pretrained models

The Intel® Distribution of OpenVINO™ toolkit includes two sets of optimized models that can expedite development and improve image processing pipelines for Intel® processors. Use these models for development and production deployment without the need to search for or to train your own models.

Full list of models at: Pretrained Models

Reference Implementations

Open-sourced reference implementations to quickly deploy with pre-built projects

Intruder Detector
Build an application that alerts you when someone enters a restricted area. Learn how to use models for multiclass object detection.

Restricted Zone Notifier
Secure work areas and send alerts if someone enters the restricted space.

Store Traffic Monitor
Monitor three different streams of video that count people inside and outside of a facility. This application also counts product inventory.

Shopper Gaze Monitor
Build a solution to analyze customer expressions and reactions to product advertising collateral that is positioned on retail shelves.

Parking Lot Tracker
Receive or post information on available parking spaces by tracking how many vehicles enter and exit a parking lot.

Machine Operator Monitor
Send notifications when an employee appears to be distracted when operating machinery.

View all reference implementations

Projects

AI has the power to save lives, protect the environment, and change the world. Start your AI at the edge development today.

Smart Shopping Cart
Gives off-line retailers additional opportunities to advertise products in a fashion similar to online sellers (i.e., Based on the products already placed in a shopping cart)

3D Printing Error Detection
Offline analysis is accomplished with a digital microscope connected to a laptop running Ubuntu* and the Intel® Neural Compute Stick 2. After analysis, contamination sites are marked on a map in real time.

Machine Learning and Mammography
Detecting invasive ductal carcinoma with convolutional neural networks showing how existing deep learning technologies can be utilized to train artificial intelligence (AI) to be able to detect invasive ductal carcinoma (IDC) 1 (breast cancer) in unlabeled histology images.

CORaiL: Coral Reef Restoration and Research
Prototype a fully functional modular AI-powered underwater camera unit that continuously counts the number of visible fauna, and, as possible, assign a taxonomy.

Technical Specifications

Specifications	Intel® Neural Compute Stick 2
Vision Processing Unit (VPU)	The Intel® Movidius™ Myriad™ X VPU
Software development kit	Intel® Distribution of OpenVINO™ toolkit
Operating Systems support	Ubuntu* 16.04.3 LTS (64 bit), Windows® 10 (64 bit), CentOS* 7.4 (64 bit), Raspbian*, and other via the open-source distribution of OpenVINO™
Supported framework	TensorFlow*, Caffe*, MXNet*, ONNX*, and PyTorch* / PaddlePaddle* via ONNX* conversion
Connectivity	USB 3.1 Type-A, USB 2.0 Type-A
Dimensions	72.5mm X 27mm X 14mm
Operating temperature	0° - 40° C
Material Master Number	964486
MSRP	$69 USD as of July 14, 2019
Supported platforms	x86_64, ARM

Additional Resources

- Getting Started
- Forum
- Tutorials

[1]Testing by Intel as of October 12th, 2018
Deep Learning Workload Configuration. Comparing Intel® Movidius™ Neural Compute Stick based on Intel® Movidius™ Myriad™ 2 VPU vs. Intel® Neural Compute Stick 2 Intel® Movidius™ Myriad™ X VPU with Asynchronous Plug-in enabled for (2xNCE engines). As measured by images per second across GoogleNetV1. Base System Configuration: Intel® Core™ I7-8700K 95W TDP (6C12T at 3.7GHz base freq and 4.7GHz max turbo freq), Graphics: Intel® UHD Graphics 630 Total Memory 65830088 kB Storage: INTEL SSDSC2BB24 (240GB), Ubuntu 16.04.5 Linux-4.15.0-36-generic-x86_64-with-Ubuntu-16.04-xenial, deeplearning_deploymenttoolkit_2018.0.14348.0, API version 1.2, Build 14348, myriadPlugin, FP16, Batch Size = 1. Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information visit www.intel.com/benchmarks. Performance results are based on testing as of October 12th, 2018 and may not reflect all publicly available security updates. See configuration disclosure for details. No product can be absolutely secure.