

YOUR SMOOTHER PATH TO MACHINE LEARNING



Intel® Software Tools Boost Productivity and Performance

Machine learning promises to deliver competitive advantages across every industry, and software developers and data scientists are the maestros who can make it happen.

MACHINE LEARNING MAXIMIZED BUSINESS ADVANTAGE

Companies that use analytics best are . . .

2X more likely to make data-driven decisions¹

5X more likely to make decisions faster than others¹

3X more likely to execute on decisions faster¹

2X more likely to have top-quartile financial results¹

Machine learning (a subset of analytics) lowers development costs by learning and adapting to the external world without explicit programming.

You've heard all about machine learning. It's transforming the way we live, do business, and even how we program computers. But to get machines to work for us, we must understand how to best work with machines.

The Tools for Better, Faster Machine Learning

Intel® Software Development Tools make the hard work of machine learning easier and more efficient. These tools support an end-to-end machine learning workflow for optimal performance and faster time to market.

Intel® Machine Learning Performance Libraries

- **Intel® Data Analytics Acceleration Library (Intel® DAAL).** This open source performance library provides the necessary optimized building blocks for all data analytics stages, including data preparation, machine learning, and decision-making.
- **Intel® Math Kernel Library (Intel® MKL).** The fastest and most-used math library for Intel® and compatible processors features optimized, threaded, and vectorized primitive math functions.
- **Intel® MKL for Deep Neural Networks (Intel® MKL-DNN).** An open source subset of Intel MKL including deep neural network (DNN) performance primitives, this library accelerates compute-intensive parts of deep learning applications (e.g., Caffe, TensorFlow*, Theano*, and Torch).
- **Intel® Machine Learning Scaling Library (Intel® MLSL).** A communication library for achieving machine learning framework-scaling performance across multiple compute nodes in a cluster.

Intel Machine Learning Tools

- **Intel® Distribution for Python*.** This all-inclusive, out-of-the-box distribution accelerates Python core packages (such as NumPy*, SciPy, pandas, and scikit-learn*) for machine learning and a lot more.
- **Intel® Deep Learning SDK.** A free set of deep learning tools for end-to-end workflow including model training and deployment. All in an easy and visual way to set up, tune, and run deep learning algorithms.
- **Trusted Analytics Platform.** This open source platform simplifies collaborative data science and analytics application development. All tools, components, and services are accessible in one place.
- **Intel-optimized frameworks.** Intel now offers several popular machine learning frameworks that are optimized for Intel® architecture, including Apache Spark*, Caffe* and several others.

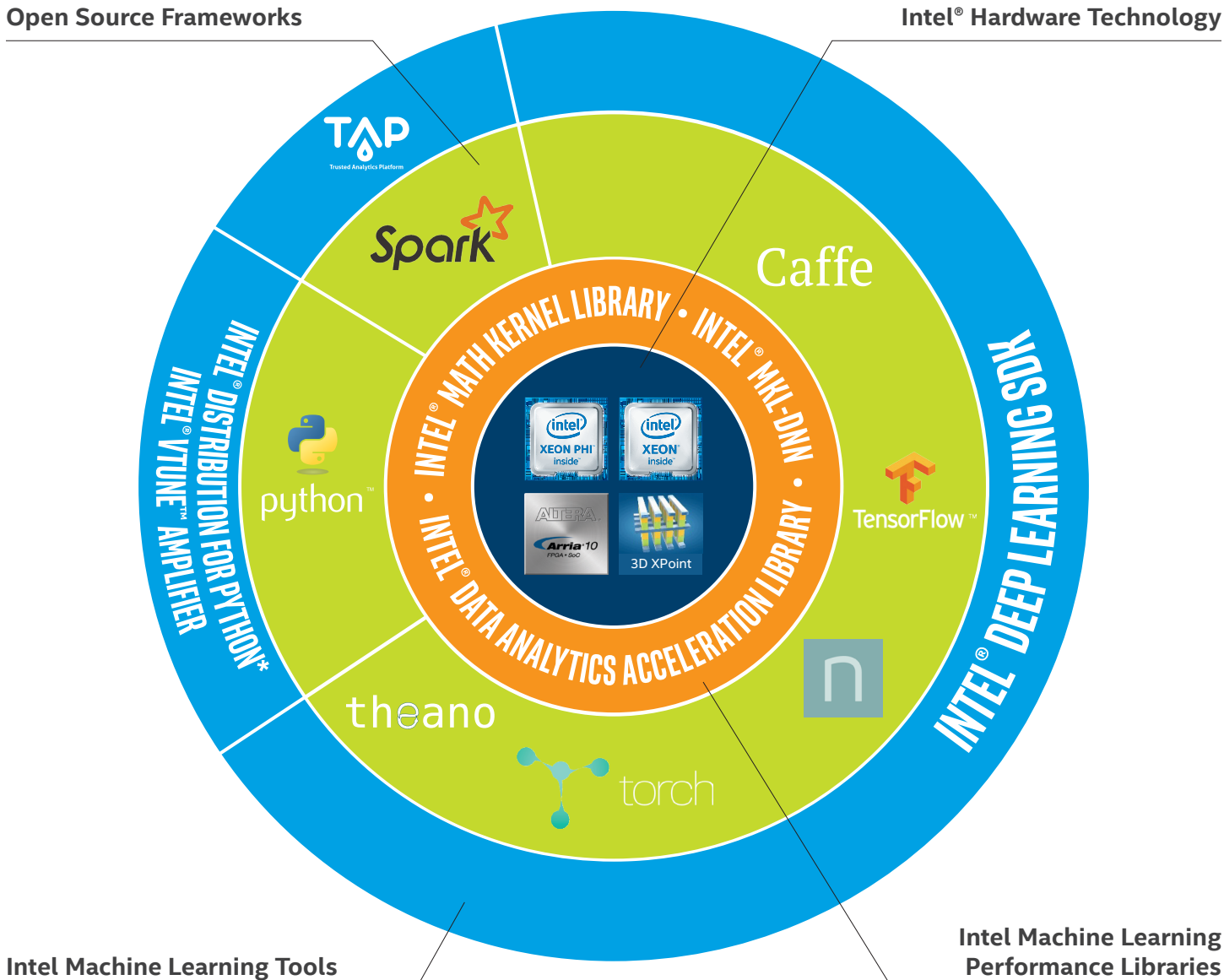
MAKING MACHINE LEARNING WORK FOR YOU

Challenges	Solutions
Machine learning requires compute-intensive applications that can take a long time	Intel software tools are optimized for Intel® architecture, so the software operates on the silicon at premium levels of performance.
Diverse tools and third-party libraries and frameworks create complexity	Intel software tools offer a simpler, cohesive development and deployment workflow with such tools as Intel® Distribution for Python* and Intel® DAAL. Intel-optimized versions of Caffe* and Theano* also are available, with more frameworks being added in the near future.
Deep learning requires programming experience	The Intel® Deep Learning SDK offers an easy-to-use graphical user interface so data scientists can perform the necessary steps of deep learning without coding.

INTEL SOFTWARE TOOLS WORK AS PART OF YOUR LARGER MACHINE LEARNING OPERATION

Open Source Frameworks

Intel® Hardware Technology



SUPPORTED HARDWARE

Intel machine learning libraries and tools support processors including, but not limited to, Intel® Core™ processors and Intel® Xeon® and Xeon Phi™ processors and coprocessors, along with FPGA accelerators.



System requirements vary by tool. Please see the **Learn More** links below for specific requirements.

LICENSING

Intel software tools for machine learning are available with different licensing options.

- **Intel DAAL:** Open source Apache 2.0 license and free forum-supported binary distributions. Also available as part of Intel® Parallel Studio with Intel Premier Support.
- **Intel MKL:** Free forum-supported binary distribution. Also available as part of Intel® Parallel Studio and Intel® System Studio with Intel® Premier Support.
- **Intel MKL-DNN:** Open source Apache 2.0 license.
- **Intel MLSL:** Free forum-supported binary distribution.
- **Intel Distribution for Python:** Free forum-supported binary distribution. Also available as part of Intel® Parallel Studio with Intel Premier Support.
- **Trusted Analytics Platform:** Open source Apache 2.0 license.
- **Intel Deep Learning SDK:** Free forum-supported binary distribution.

SUPPORT

Free community support is available by product on Intel® Developer Zone forums:
software.intel.com/forum

LEARN MORE

- **Intel Artificial Intelligence Developer Zone:** software.intel.com/ai
- **Intel DAAL:** software.intel.com/en-us/intel-daal
- **Intel MKL:** software.intel.com/en-us/intel-mkl
- **Intel MKL-DNN:** bit.ly/2dfLyzs
- **Intel Distribution for Python:** software.intel.com/en-us/intel-distribution-for-python
- **Trusted Analytics Platform:** software.intel.com/en-us/bigdata/tap
- **Intel Deep Learning SDK:** software.intel.com/deep-learning-sdk



TRY THE COMPLETE PERFORMANCE SUITE



Intel® Parallel Studio XE high performance software tools include Intel® DAAL, Intel® MKL, plus other performance libraries, compilers, a tuner, and whole lot more. Free 30-day trial versions are available.

Learn more at
software.intel.com/intel-parallel-studio-xe.

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1. Mankins, Michael C., and Lori Sherer. 2015. [Creating value through advanced analytics](#). Bain & Company, Inc.

For more complete information about performance and benchmark results, visit www.intel.com/benchmarks.

For more complete information about compiler optimizations, see our Optimization Notice at software.intel.com/en-us/articles/optimization-notice#opt-en.

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