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OBJECT DETECTION ON INTEL ARCHITECTURE TURNS IMAGES INTO MEANINGFUL INFORMATION

Written by Ravi Panchumarthy | April 28, 2017

Across a growing range of industries, there's a need to analyze large amounts of data gathered from various end points to obtain meaningful insights. Artificial intelligence (AI) enables machines to perform tasks with human-like intelligence by interpreting that input data, and deep learning algorithms are able to accelerate these AI capabilities in image, video, audio and text analysis.

For example, deep learning can classify objects from a live video stream using Intel's optimized Caffe* framework, and the Single Shot MultiBox Detector deep learning architecture can detect objects in images. The Single Shot MultiBox Detector uses a single deep neural network with the ability to pool from different scales of the feature maps. As a result, the overall algorithm can detect objects at various scales and sizes with more accuracy.

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the image.

Here are a few examples of how object detection can be used across different industries:

- In security and surveillance applications, object detection can identify objects people are carrying that could be used as a weapon.
- In autonomous vehicles, object detection software can recognize a person crossing the street, an animal in the path of the car, or a nearby stop sign. It can also differentiate between a pebble and a rock in a moment's notice, which is crucial when speed is a factor and accuracy matters.
- In manufacturing, object detection software can identify defective or incorrect parts on an assembly line.

At a technical level, the diverse use cases for live object detection share a common need: processing power, and lots of it. In a deep learning context, training and inferencing processes are computationally intensive tasks, and the power of the Intel® Xeon® processor E5 family provides this level of processing power.

Intel is focused on providing optimized hardware with optimized libraries and frameworks to drive ever-higher performance for AI applications running on the Intel Xeon processor E5 family. Object detection capabilities are incorporated in the Intel® Deep Learning SDK [https://itpeernetwork.intel.com/optimizing-deep-learning-sdk/] , which is a free package of tools that developers and data scientists can use to accelerate the development of deep learning solutions.

Object detection software also gets a boost from Intel® Math Kernel Library [https://software.intel.com/en-us/intel-mkl] , which accelerates math processing and neural network routines that increase application performance and reduce development time. With its highly optimized, threaded and vectorized functions, Intel MKL maximizes performance on each processor family.

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optimized fork dedicated to improving Caffe* performance when running on CPUs, in particular Intel Xeon processor-based servers. The Intel Distribution for Caffe* supports Single Shot MultiBox Detector [https://github.com/intel/caffe/wiki/SSD:-Single-Shot-MultiBox-Detector] to detect objects in images using a single deep neural network.

The combination of optimized Intel Xeon processor families and optimized libraries and frameworks yields higher performance for object detection applications running on Intel® architecture. We demonstrated this application at the International Conference on Learning Representations (ICLR) in Toulon, France this week. The interactive demo showed how an AI application detects objects in a live webcam video stream.

Ready to jump into the sandbox? You can download the Intel Deep Learning SDK to try it out on intel.com/ai [http://www.intel.com/ai] or GitHub [https://github.com/intel/caffe/wiki/SSD:-Single-Shot-MultiBox-Detector] . Or, for a demo of the object recognition software capabilities, similar to the demo shown at ICLR, grab a seat for this YouTube video [https://www.youtube.com/watch?v=RoUNDyJkgeQ] from IDG.tv at the South by Southwest Conference earlier this year.

📅 April 28, 2017 [https://itpeernetwork.intel.com/object-detection-intel-architecture-images-meaningful-information/]

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