Higher Quality, Better Precision

AxxonSoft Makes Its Neural Network Training Models More Effective with Intel® Technologies

"We can use much bigger batch sizes with neural network training on Intel® Xeon® processors. This results in higher-quality models. As a result, our network is more unified, works out of the box, and requires minimum or no additional training."

Egor Suchkov
Head of the Computer Vision Department
AxxonSoft

Neural network training is an essential aspect of video surveillance and analytics systems. And to give its customers the best possible performance, AxxonSoft needs the best possible training models. After trying multiple options, the company chose Intel® Xeon® processor-based servers instead of GPU-based servers for higher-quality, more precise results.

The Challenge: Higher-Quality Models

AxxonSoft develops smart, integrated video surveillance and video analytics systems. Its video management system (VMS) and physical security information management (PSIM) platforms power more than 240 Safe City municipal surveillance projects and security systems at retailers, banks, international airports, seaports, and industrial sites around the world.

The company's open VMS and PSIM platforms are designed to create security systems of any scale based on various types of equipment—integrating video surveillance, access control, fire protection, and other specialized systems into a single information environment that supports interaction of all subsystems, intellectual information analysis, and automatic control.

"We can use much bigger batch sizes with neural network training on Intel Xeon processors," explained Egor Suchkov, head of the Computer Vision Department at AxxonSoft. "This results in higher-quality models. The Intel Xeon processor-based server allows us to train a network with 500K pictures with a batch size of around 1,500, using about 500Gb of memory. As a result, our network is more unified, works out of the box, and requires minimum or no additional training."

Using the Newest Technologies

AxxonSoft is an early adopter of Intel® technology and was one of the first to implement the vector neural network instructions (VNNI) that are part of the Intel Xeon processor architecture.

The Intel Software team provided consulting to help ensure AxxonSoft had the best possible experience with the newest technology. AxxonSoft uses a wide range of Intel® architecture-based products including Intel® Core™ and Xeon® processors, CPUs, iGPUs, HDDL cards, Intel® Optimization for Caffe, Intel® Distribution for Python*, and Intel® Distribution of OpenVINO™ Toolkit.

"Currently, we use the Intel Distribution of OpenVINO Toolkit's libraries as the default for all our projects based only on CPUs or coprocessors—such as HDDL and Movidius. This allows us to achieve performance comparable to a GPU-based server," explained Suchkov.

Higher-Quality, More Precise Models

"We also tried Nvidia GPUs for training," he explained. "We found that training took less time but resulted in a lower-quality model. The Intel Xeon processors can address a larger volume of memory compared to GPUs and, as a result, enable bigger batch sizes. Models trained with bigger batch size have higher quality, better precision, and can be used on a broader range of AxxonSoft deployments without additional training.

Intel Optimization for Caffe and Intel Distribution for Python allow us to use the full power of Intel architecture."

Learn More

- **Intel Distribution for Python**

- **Intel Distribution of OpenVINO Toolkit**

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 information go to www.intel.com/benchmarks.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [most relevant URL to your product]. No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document.

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.

This document contains information on products, services and/or processes in development. All information provided here is subject to change without notice. Contact your Intel representative to obtain the latest forecast, schedule, specifications and roadmaps.

The products and services described may contain defects or errors known as errata which may cause deviations from published specifications. Current characterized errata are available on request.

Copies of documents which have an order number and are referenced in this document may be obtained by calling 1-800-548-4725 or by visiting www.intel.com/design/literature.htm. Intel, Core, Xeon, OpenVINO, and the Intel logo, are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

*Other names and brands may be claimed as the property of others

© 2020 Intel Corporation.   SS/0320