Solution Brief

Human Resources
Talent Acquisition

XOPA AI Accelerates Emotional Analysis Training Time On High-Resolution Imagery

Intel® Optimizations for TensorFlow and Intel Math Kernel Library for Deep Neural Networks reduce training time by 65 percent[1], allowing faster service delivery with potentially lower cost

Intel®
AI Builders
Member

XOPAAi
MAXIMISING OBJECTIVITY IN HIRING

Hiring employees is a critical practice in any company in order to fill positions with the best candidates that will help grow the organization. A corporate job opening typically attracts 250 résumés,[2] keeping recruiters very busy finding the best prospects. With these heavy workloads, recruiters take a mere six seconds to make the initial decision of who makes it to the next stage of the hiring process.[3]

Historically, hiring has been a subjective process—people evaluating people based on many factors, often presented in an interview. With today's data-driven business environment and availability of intelligent tools, bringing objectivity into the recruitment process has gotten easier.

X0PA AI uses Artificial Intelligence (AI) and machine learning to help recruiters gain more insight to hire ideal candidates. Top companies are taking advantage of AI-aided tools such as those from X0PA AI because they:

- Increase employee retention by 56%.
- Evaluate skill gaps with 50% more accuracy.
- Increase the quality proposition/offer to the candidates by 50%.[4]

Such technologies help companies reduce the recruiters' workload, leading to adding more high-quality staff in a short period.

X0PA AI Analytics Platform

Hiring a candidate not well suited for a position can have crucial effects on company performance, employee attrition, and personnel morale. Yet, when the talent pool is limited, finding the right person becomes more difficult. X0PA AI helps remove uncertainty from the hiring process and adds objectivity supported by big data and AI for better candidate selection.

X0PA AI built its leading Software as a Service (SaaS) hiring and talent acquisition platform to help companies choose ideal candidates. The platform uses predictive analytics with multiple metrics, such as CV relevance, loyalty, emotion, attitude, and performance, to help recruiters determine if a candidate is best suited for a job.

One of the company's tools provides real-time evaluation of emotions from a recorded interview to allow recruiters to better understand their candidates and make more informed hiring decisions. In-depth, machine-based emotional analysis of the applicant's responses during the interview not only provides insights, but it helps maximize objectivity in hiring.

The tool's algorithm implements transfer learning from a VGG16 pre-trained model with the addition of a few new layers in the convolutional neural network (CNN) structure to predict the emotion during the interview. The solution dissects the interview video stream into a series of pictures at a high frame rate (frames per second—FPS), calls the trained model, and inferences the time-series images to predict the emotion presented by the candidate. After inferencing the raw data for emotion, the platform applies domain knowledge and additional machine learning algorithms to provide greater insight from the interview and relevant data.

The large size of the converted images plays an important role in the classification quality of emotions. Yet, larger images are more compute intensive than smaller images, and compute time affects costs and time to solution. By reducing the time to inference without loss of accuracy of the prediction, X0PA AI can offer faster, less costly services to their customers.

As an Intel Builder member, X0PA AI's engineering team engaged with Intel to benchmark and optimize their algorithms for Intel® architecture and technologies. The objective of the benchmarking was to accelerate training and understand the impact of image size on their model.

Reducing Training Time with Optimizations for Intel Architecture

X0PA AI's model is built on the open source TensorFlow framework, which runs demanding floating-point operations. Intel offers optimized libraries specifically designed to improve performance of TensorFlow-based models, by taking advantage of technologies built into 2nd generation Intel Xeon® Scalable processors. The libraries and optimizations applied to X0PA AI's models included Intel Optimizations for TensorFlow and Intel Math Kernel Library for Deep Neural Networks (Intel MKL-DNN). Additionally, image inferencing is a great candidate for integrating the Intel Distribution of OpenVINO™ toolkit to accelerate visual computing.

As described above, image size impacts analysis quality and compute intensity. 480x480-pixel images were used for optimization testing. Optimizing X0PA AI's emotional analysis model on 2nd Gen Intel Xeon Gold 6248 Scalable processors with Intel libraries reduced training time on 480x480 images by 65 percent[1] over the open source TensorFlow-based model.

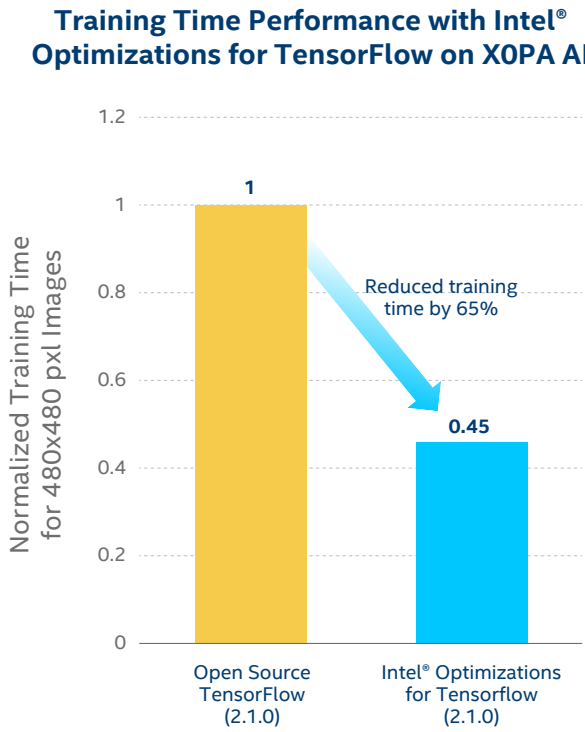

Figure 1. Intel optimizations for X0PA AI's recruitment platform reduces training time by 65%.[1]

By accelerating training time, X0PA AI can deliver solutions faster to customers, potentially impacting their cost of services to customers.

X0PA AI runs on Microsoft cloud services, using the following technologies:

- Microsoft Azure
- Microsoft Azure PostgreSQL
- MongoDB
- Azure Security
- Azure Cache for Redis

Microsoft Azure cloud offers instances built on 2nd Gen Intel Xeon Scalable processors.

Conclusion

Working with the Intel Builders program played a key role in helping X0PA AI to improve their model development process. The optimizations allowed developers to boost their AI development process by reducing the training time with minimal programming changes and no loss of predictive accuracy. Additionally, working with Intel introduced them to the benefits of future integration of Intel Distribution of OpenVINO toolkit to improve accuracy and leverage existing solutions for further applications in their domain.

For more information about XOPA AI, visit **x0pa.com**

Learn more about the Intel AI Builders program at **builders.intel.com/ai/membership**

Intel®
AI Builders
Member

X0PA AI is the leading SaaS hiring and talent acquisition platform for companies that choose to make a difference with great people.

---

[1] Customized VGG model training on TensorFlow* Throughput Performance on Intel® Xeon® Gold 6252 Processor:

NEW: Tested by Intel as of Jul/2020. 2 socket Intel® Xeon® Gold 6252 CPU @ 2.10 GHz, 24 cores HT On Turbo ON Total Memory 192 GB (12 slots/16 GB/2666 MTs/DDR4 DIMM), BIOS: SE5C620.86B.02.01.0011.032620200659 (ucode: 0x5002f01), Ubuntu 18.04.4 LTS, 5.3.0-61-generic, Deep Learning Framework: Intel® Optimized TensorFlow* 2.1.0 (pip install), MKL DNN version: 2019.0 Update 5 Product build 20190502, Customized VGG: Multi Layer, BS=32, customer data, 1 instance/2 socket, Datatype: FP32

BASELINE: Tested by Intel as of Jul/2020. 2 socket Intel® Xeon® Gold 6252 CPU @ 2.10 GHz, 24 cores HT On Turbo ON Total Memory 192 GB (12 slots/16 GB/2666 MTs/DDR4 DIMM), BIOS: SE5C620.86B.02.01.0011.032620200659 (ucode: 0x5002f01), Ubuntu 18.04.4 LTS, 5.3.0-61-generic, Deep Learning Framework: Public TensorFlow* 2.1.0 (pip install), Eigen, Customized VGG: Multi Layer, BS=32, customer data, 1 instance/2 socket, Datatype: FP32

[2] https://www.glassdoor.com/employers/blog/50-hr-recruiting-stats-make-think/#:~:text=Recruiting%20has%20gone%20social%20%26%20mobile,will%20be%20offered%20a%20job.

[3] https://www.theladders.com/career-advice/you-only-get-6-seconds-of-fame-make-it-count#:~:text=In%20fact%2C%20Ladders%20launched%20a,candidate%20in%20only%20six%20seconds!&text=It%20truly%20only%20takes%20a,is%20in%20tip%2Dtop%20shape.

[4] http://www.workonic.com/top-recruitment-statistics-of-2019/

Intel is committed to respecting human rights and avoiding complicity in human rights abuses. See Intel's Global Human Rights Principles information at https://www.intel.com/content/www/us/en/policy/policy-human-rights.html. Intel's products and software are intended only to be used in applications that do not cause or contribute to a violation of an internationally recognized human right.

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.

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

Printed in USA 1120/AU/HBD/PDF ♻ Please Recycle 344526-001US

intel®