

Object detection with deep learning: Performance optimization of neural network inference using the Intel OpenVINO™ toolkit

Abstract

We give an overview of the Intel® Distribution of the OpenVINO™ toolkit. We consider the toolkit components; describe the capabilities and application of the individual components. The practical use of the Intel® Distribution of the OpenVINO™ toolkit is demonstrated by the example of solving an object detection problem based on a deep learning approach. The application development focuses on the efficient implementation of deep neural network inference using the Inference Engine component of the OpenVINO™ toolkit. We consider the synchronous and asynchronous inference modes and select the optimal parameters of the both inference modes for the demonstration problem. Finally, we describe possible ways of increasing inference performance using the low-precision inference.

Organizers

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Tentative Schedule

11.30 — 13.00	Introduction to the Intel® Distribution of the OpenVINO™ toolkit. Inference Engine capabilities. Introduction to the performance topics
13.00 — 13.30	Lunch
13.30 — 15.30	Python API overview. An object detection problem statement. Solving the object detection problem based on a deep learning approach
15.30 — 16.00	Break
16.00 — 17.40	Implementing synchronous and asynchronous inference modes using object detection topology. Selecting optimal parameters of both inference modes
17.40 — 19.00	Workbench tool overview. Fine-tuning of the performance using low-precision (INT8)

Hardware and software requirements

Hardware:

- 3d generation of Intel® Core™ processors or higher

OS:

- Ubuntu 16.04 or higher (LTS) 64-bit
- Centos 7.4 or higher 64-bit
- Microsoft Windows 10 64-bit

Software:

- Python 3.*
- Intel® Distribution of OpenVINO™ toolkit R5 or higher (recommended 2019 R2)
[\[https://software.intel.com/en-us/openvino-toolkit\]](https://software.intel.com/en-us/openvino-toolkit)