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OpenCV FFT realization benchmark

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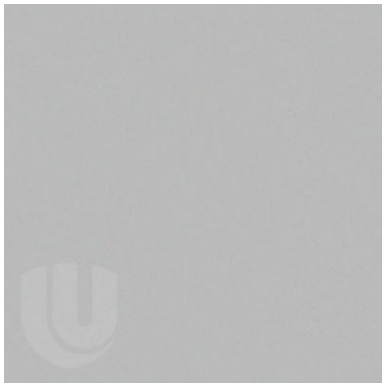
Introduction

- OpenCV is worldwide library with computer vision algorithms.
- It is free for using in commercial software (almost all modules) instead of alternatives (like MKL-FFT or FFTW).

- Aim of this project is to measure FFT speed of FFT algorithm in OpenCV realization.

Test data

- Input image – synthetic image with white gauss noise and lighted logo.
  - 1000*1000 px
  - 2000*2000 px



Environment

- Customer PC
  - CPU Intel core i7 8600 2.5GHz (6 cores, 12 threads)
  - Ubuntu 18.04 LTS
  - Compiler GCC GNU 7.4.0
- Language - C++11
- OpenCV 3.2.0 from Ubuntu repository
- OpenCV 4.1.0 precompiled by Intel (from OpenVINO)
- OpenCV 4.1.1 build from sources with default settings

Image 1000 x 1000

Input image	OpenCV version	DFT time, sec	IDFT time, sec	Total time, sec
1000x1000	3.2.0-ubuntu	0.016	0.010	0.028
1000x1000	4.0.1-openvino	0.004	**0.003**	**0.007**
1000x1000	4.1.2-sources	**0.003**	**0.003**	**0.007**

Image 2000 x 2000

Input image	OpenCV version	DFT time, sec	IDFT time, sec	Total time, sec
2000x2000	3.2.0-ubuntu	0.077	0.045	0.126
2000x2000	4.0.1-openvino	**0.017**	**0.015**	**0.033**
2000x2000	4.1.2-sources	**0.017**	**0.015**	**0.033**

Conclusions

- To get the best performance, compile OpenCV on target machine or use precompiled OpenCV from Intel® Distribution of OpenVINO™ Toolkit.

- Using OpenCV from the OpenVINO package works **~4** times faster than OpenCV from Ubuntu repository!

Contacts

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- Benchmark solution:
  - https://github.com/FenixFly/OpenCV_FFT_benchmark
- OpenVINO:
  - https://01.org/openvinotoolkit