AMD

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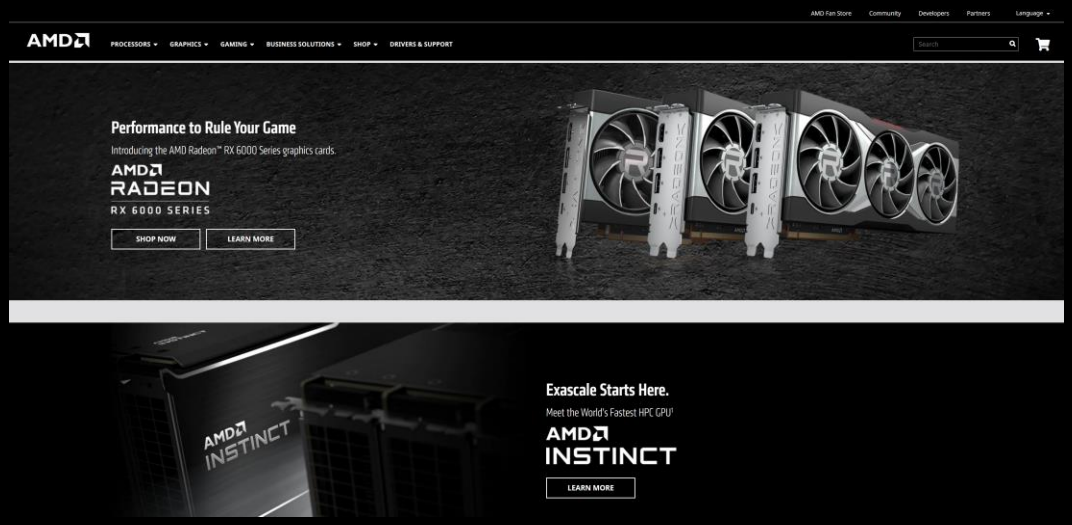
INTRODUCTION - TVM ON AMD HARDWARE

- *"OctoML announced in the collaboration with AMD to support of Apache TVM" in Nov'21*
- *Easy ML applications' deployment to AMD CPUs, GPUs, and APUs with peak efficiency and optimal power*
- *Expanding TVM support to Adaptive HPC Platforms*



ACCELERATING FACE DETECTION ON AMD GRAPHICS FEATURING THE AMD RDNA2 ARCHITECTURE USING TVM

AMIR KHOJASTE, MEI YE, WILSON YU

FACE DETECTION

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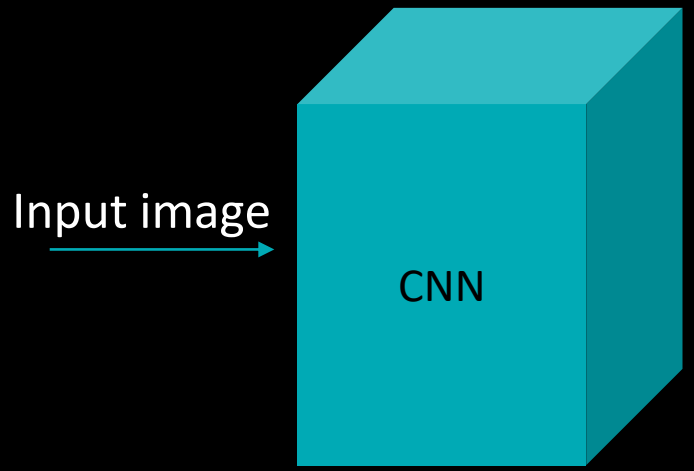
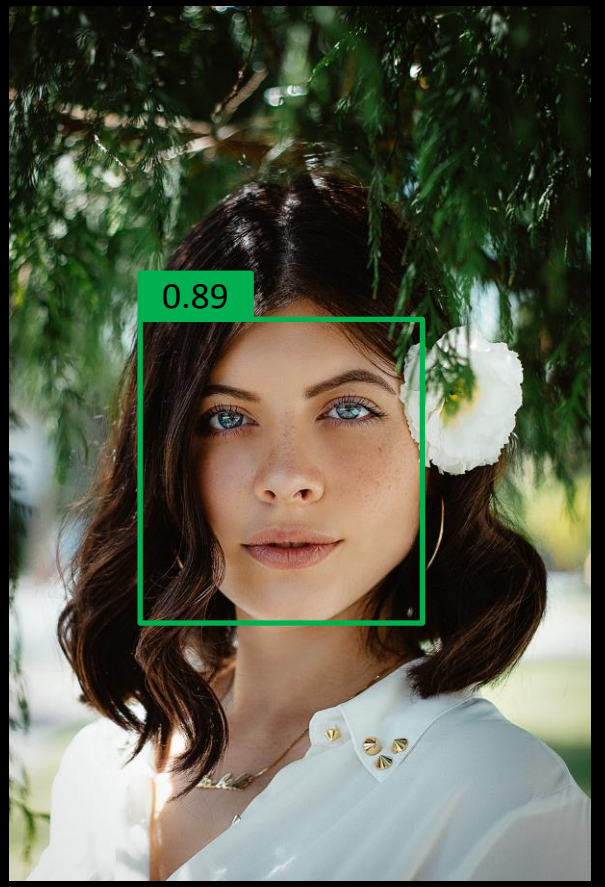
- Using convolutional neural network to detect human faces





INTEGER DOT PRODUCT SUPPORT IN TVM'S VULKAN TARGET

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- AMD RDNA2 GPUs support integer dot product instructions.
- SPIR-V integer dot product extension was ratified in August 2021 for Vulkan 1.2.190.
- AMD proprietary Vulkan driver supported SPIR-V integer dot product for RDNA2 GPUs.
- We added SPIR-V code generation for conv2d_NCHWc_int8.cuda, dense_int8.cuda, group_conv2d_NCHWc_int8.cuda.
- Vulkan SDK 1.2.198 is available for download on Nov 22, 2021.

ISSUES OF INT8 MODELS

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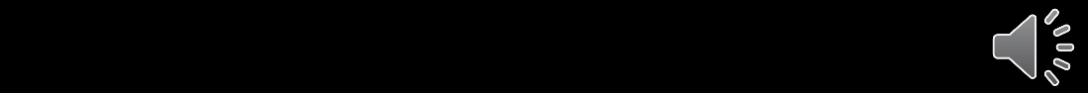
- Usage of composite operators like QLinearAdd and QLinearConv in ONNX introduces redundant pairs of requant/dequant and quant/dequant.
- Overhead of quant/dequant surrounding operators lacking quantization support.
- Overhead of layout transformations surrounding int8 operators with different layouts.
- ML frameworks (TF, PyTorch, ONNX Runtime) does not support conversion of int8 models between different formats.



COME JOIN US!

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Our group is actively hiring top talents globally:

- Santa Clara, USA
- Markham, Canada
- Shanghai, China
- Hyderabad, India

Contact us at: *dl.atg.hiring_ext@amd.com*

To find out more AMD opportunities, visit us at: *https://www.amd.com/en/corporate/careers*

THANK YOU

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