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HIGH-PERF OBJECT DETECTION ON EDGE WITH AWS™ GREENGRASS LAMBDAS

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intel AI

OUTLINE

- Introduction to ‘Edge’ environment
- Today’s technology ecosystem
- Deployment solutions
- Demo
- Summary

INTRODUCTION TO “EDGE”

WHAT IS AN 'EDGE' PLATFORM?

On-premise compute capable resource

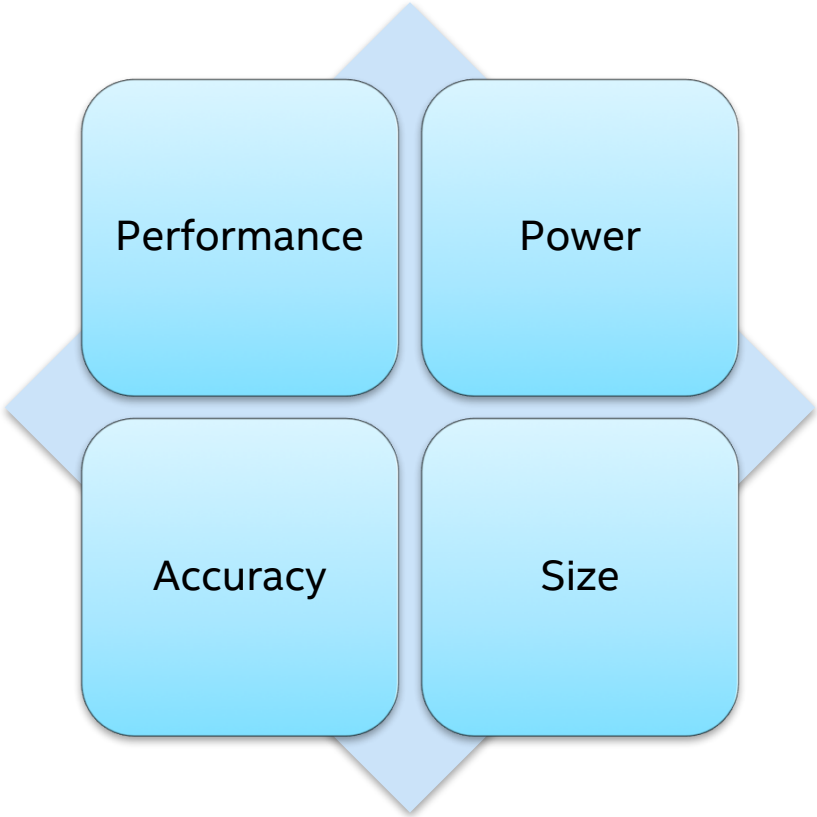
- Placed physically close to data source
- Data sources connect to the Cloud through them
- First receivers & analyzers of data
- Designed to endure on-field conditions while capable of complex analytics

WHY DO WE NEED EDGE PLATFORMS?

- Slow/Unreliable network connectivity
- Expensive network connection
- Privacy/Security of customer data

CONSTRAINTS FOR AI ON THE EDGE

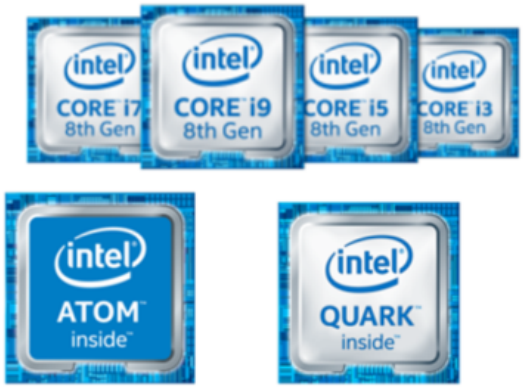
- Close to real time performance requirements
- Low power consumption
- Adaptable to different input data formats & resolutions
- Deployable on low-memory platforms
- Maintain ‘reasonable’ accuracy



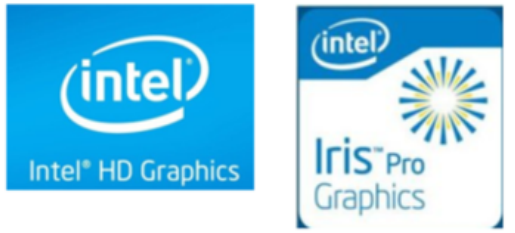
TECHNOLOGY ECOSYSTEM

HARDWARE CHOICES

General Purpose
Easily programmable



CPU



GPU

Massively parallel
High throughput

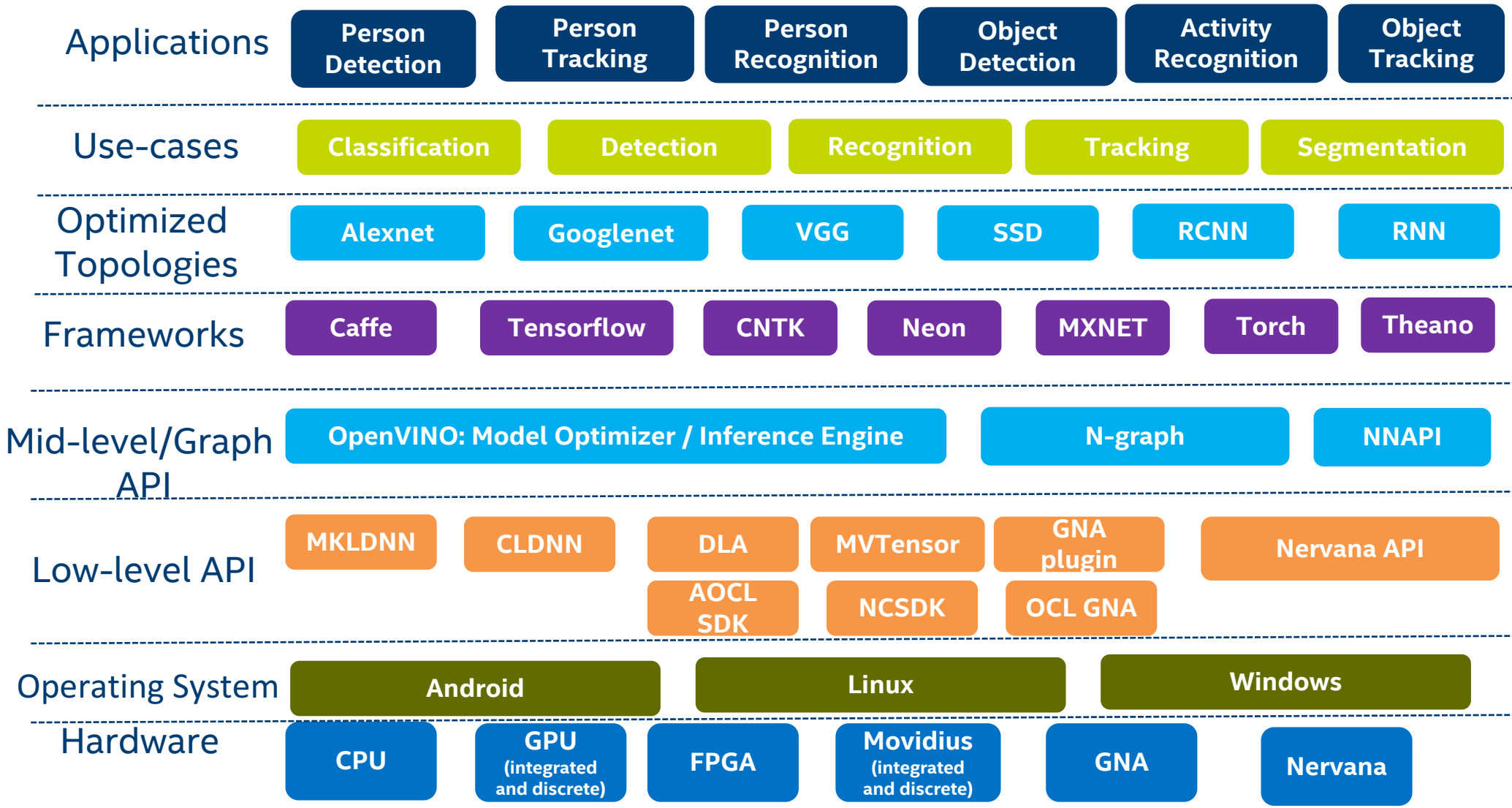
High throughput
Low power

FPGA

ASIC & ASSP

Ultra low power
Low price

SOFTWARE STACK



CHALLENGES

- Picking the right combo from the layers
- Optimizing across the stack for particular use-case
- Integration with the rest of the software pipeline

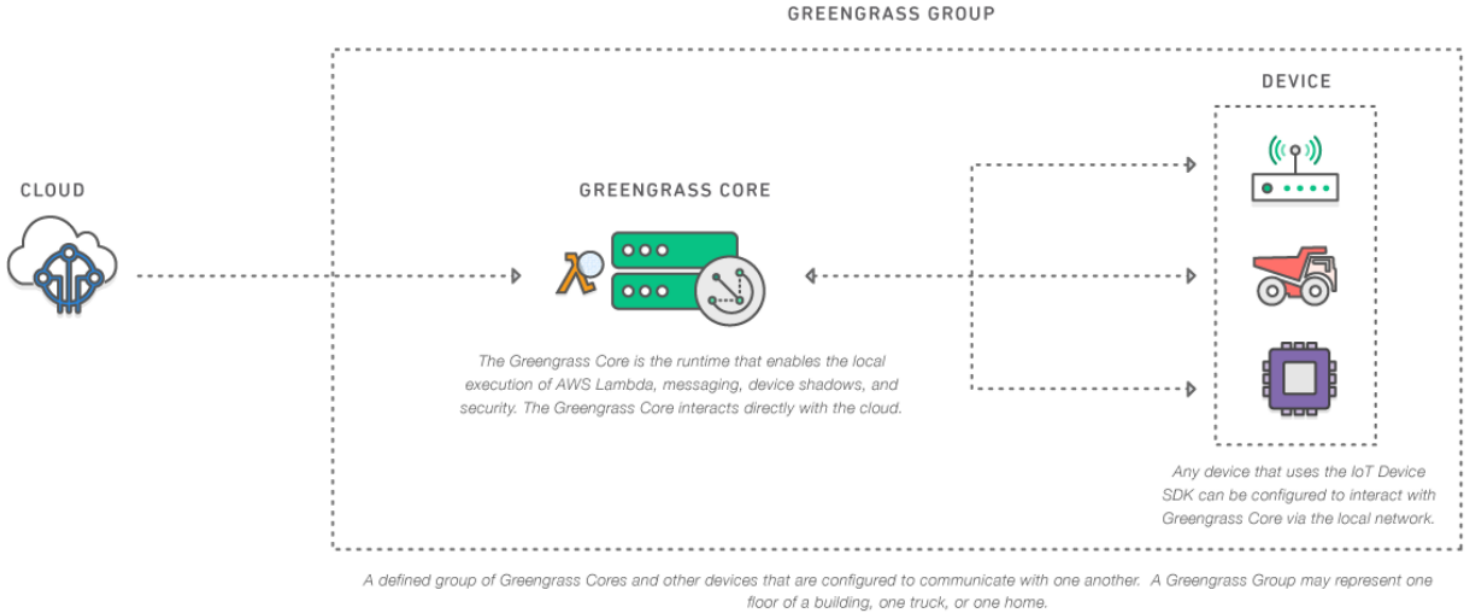
DEPLOYMENT SOLUTIONS

INTEL® IOT RFP READY KITS

- Bundled hardware, software and support
- Optimized for the specific use cases

CLOUD PLATFORM INTEGRATION

- Solutions deployed as Function as a Service (FaaS) offerings in Cloud Service Providers
- Active effort to integrate into AWS Greengrass as Lambdas
- Support for other CSPs also on roadmap



FAAS DEMO: MULTI-CLASS OBJECT DETECTION

- Identify and locate all the objects in the picture
- Accurately locate their positon in the picture with bounding boxes
- Techniques well published

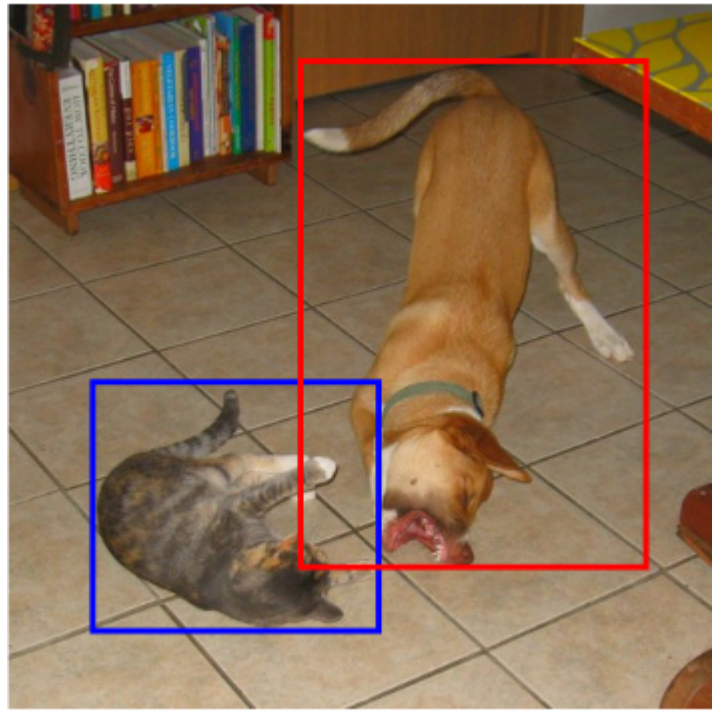


Image with bounding boxes around objects
Source: Liu et. al., SSD:SingleShot Multibox Detection

LINKS

- Intel® IoT RFP Ready Kit
  www.intel.com/content/www/us/en/products/solutions/iot.html
- FaaS released with Intel® OpenVINO™ toolkit
  software.intel.com/en-us/openvino-toolkit
- Optimized DL models available in github
  github.com/intel/Edge-optimized-models
- AI at Intel
  software.intel.com/ai-academy

CONTACT

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THANK YOU

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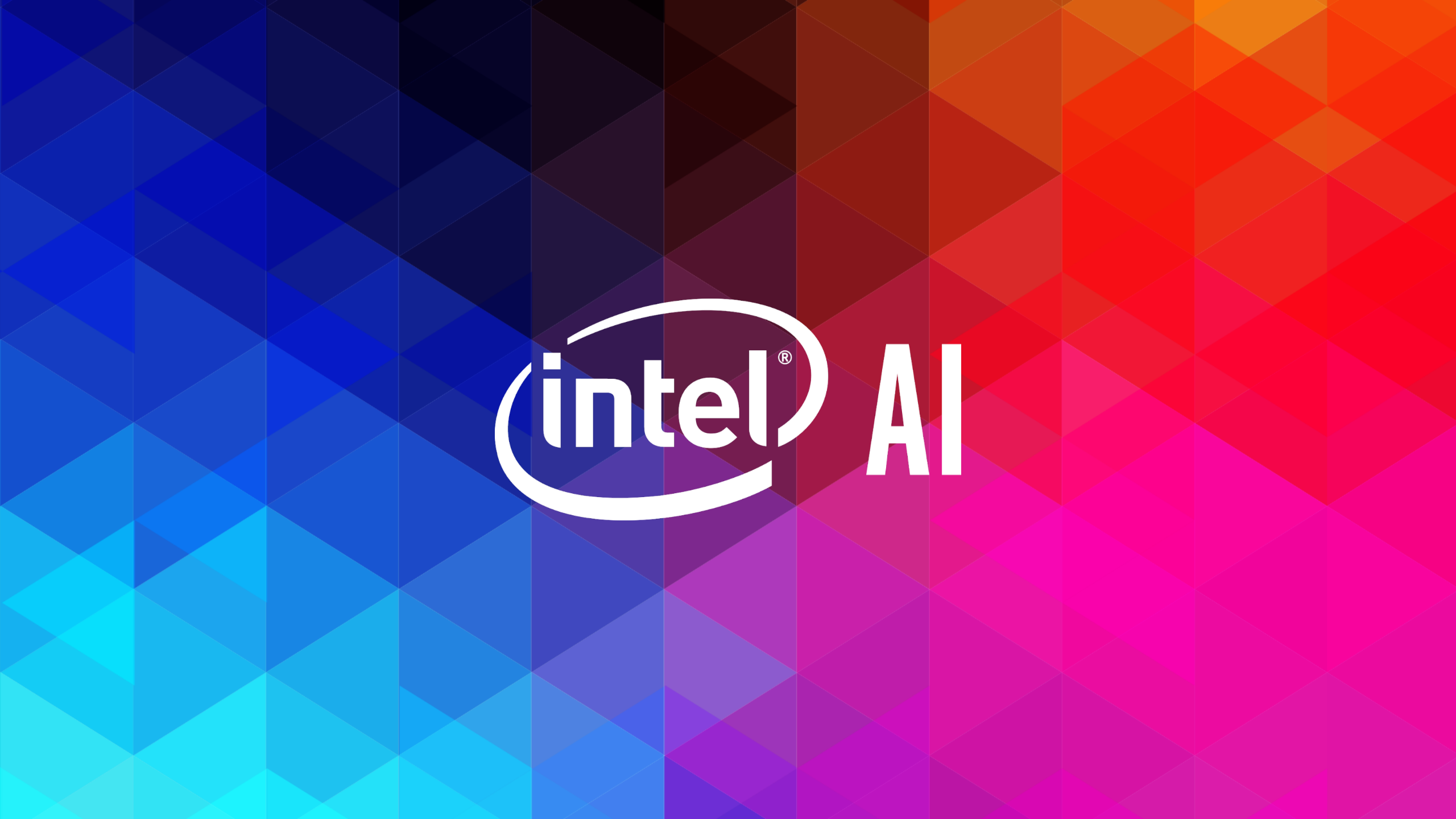
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