Introduction to Intel® Distribution of OpenVINO™ toolkit for Computer Vision Applications

100: Beginner-level
Lesson 09

Introduction to Intel® Distribution of **OpenVINO™** toolkit for Computer Vision Application

OpenVINO 100 – **Course agenda**

Lesson 1: Introduction, why do we need Artificial Intelligence (AI).

Lesson 2: What is Video, what is computer vision, how do we accelerate it on modern computers.

Lesson 3: How to accelerate Video processing

Lesson 4: How to accelerate Neural Network for vision applications

Lesson 5: Video Analytics pipeline

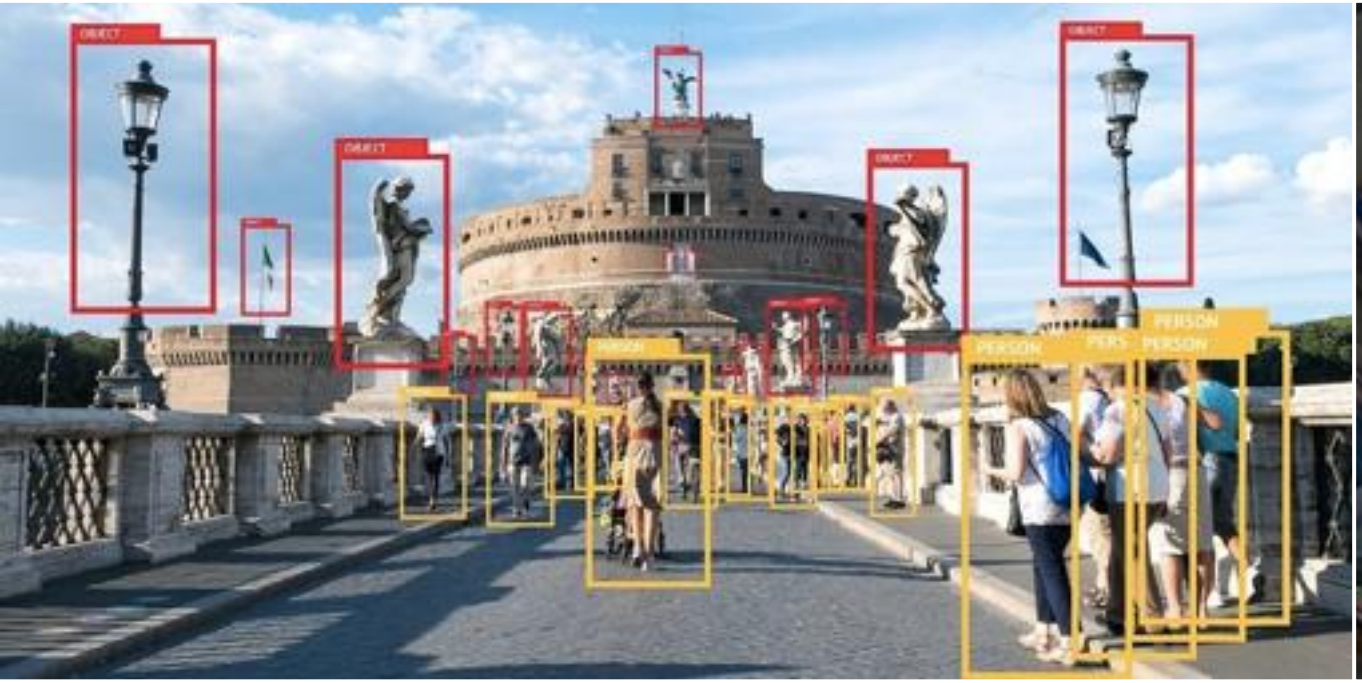
Lesson 6: Demos, OpenVINO at work

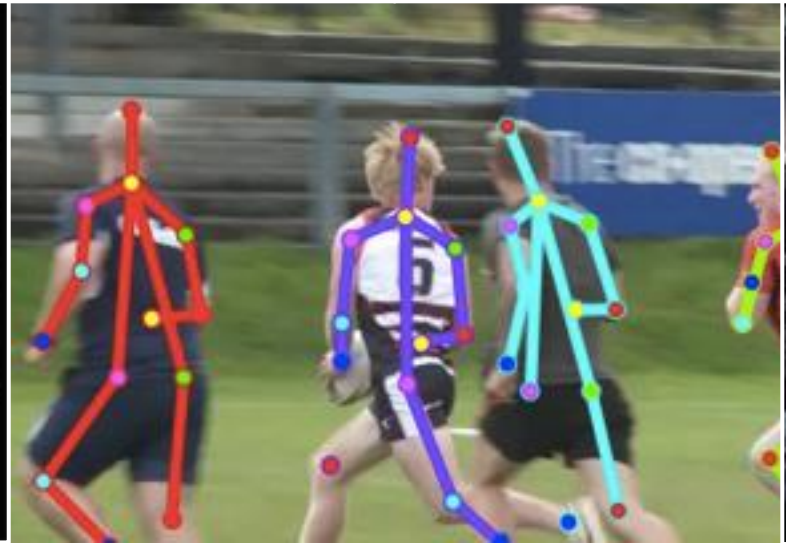
Lesson 7: The full flow, from Data to a product using Intel tools-Part 1.

Lesson 8: The full flow, from Data to a product using Intel tools-Part 2.

Lesson 9: Summary, intro to next course (200)

Visual analytics Opportunities





500 000 000

people watch Facebook videos every day.

1/3 of the time people spend online is devoted to watching videos.

74%

of all internet traffic is video

2017

2019

80%

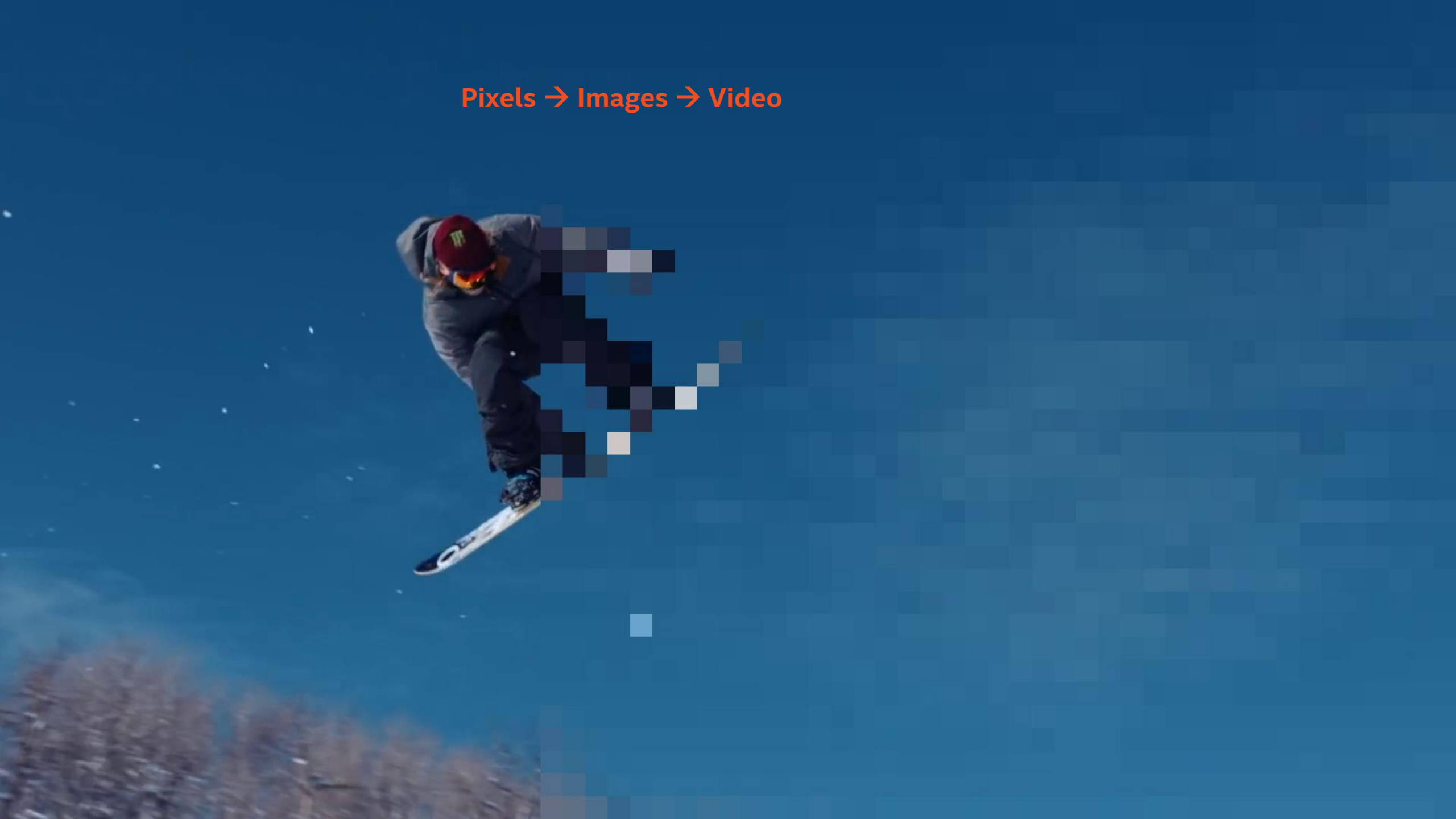
of all internet traffic will come from video

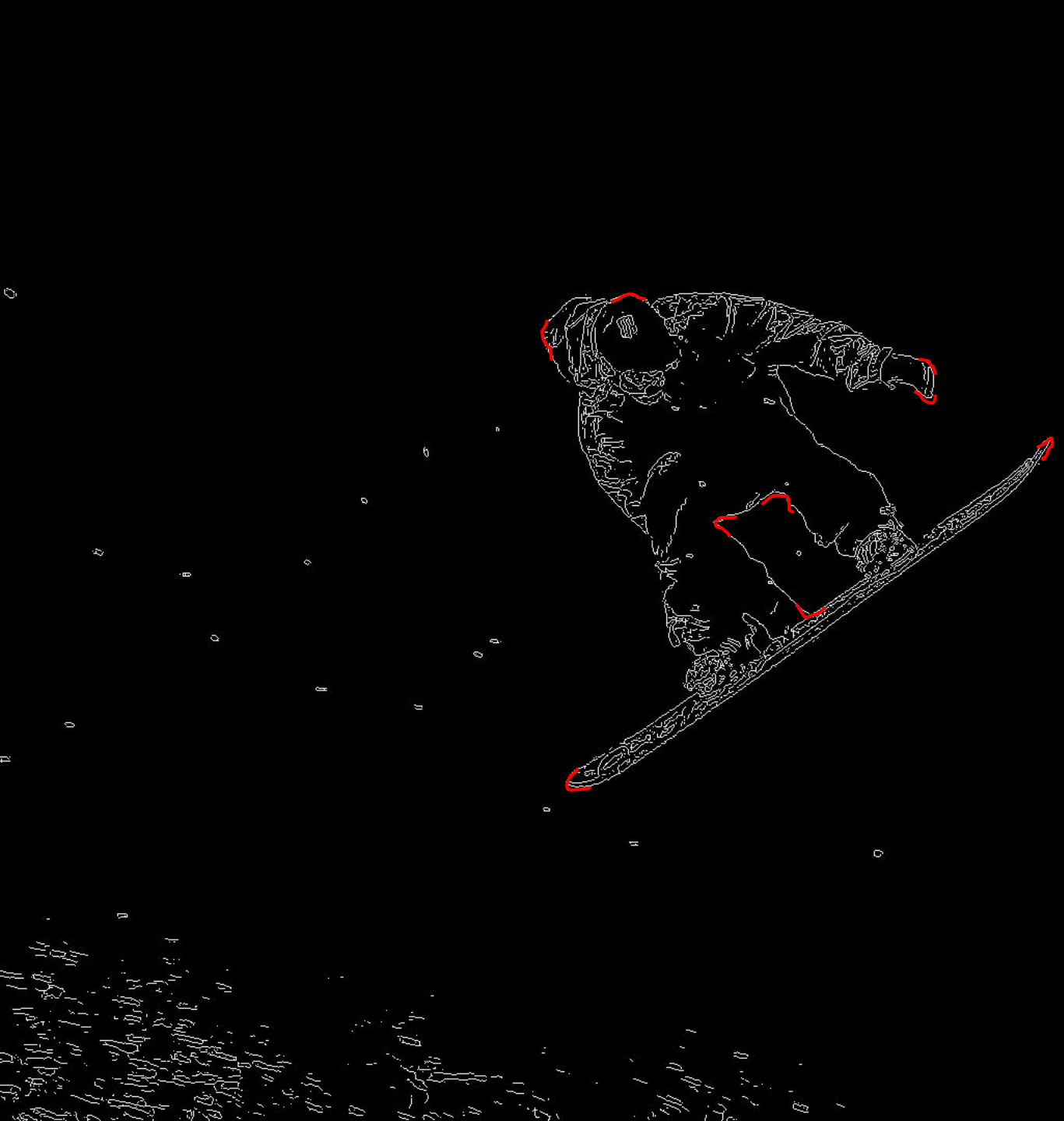
13%

of all internet traffic will consist of live video

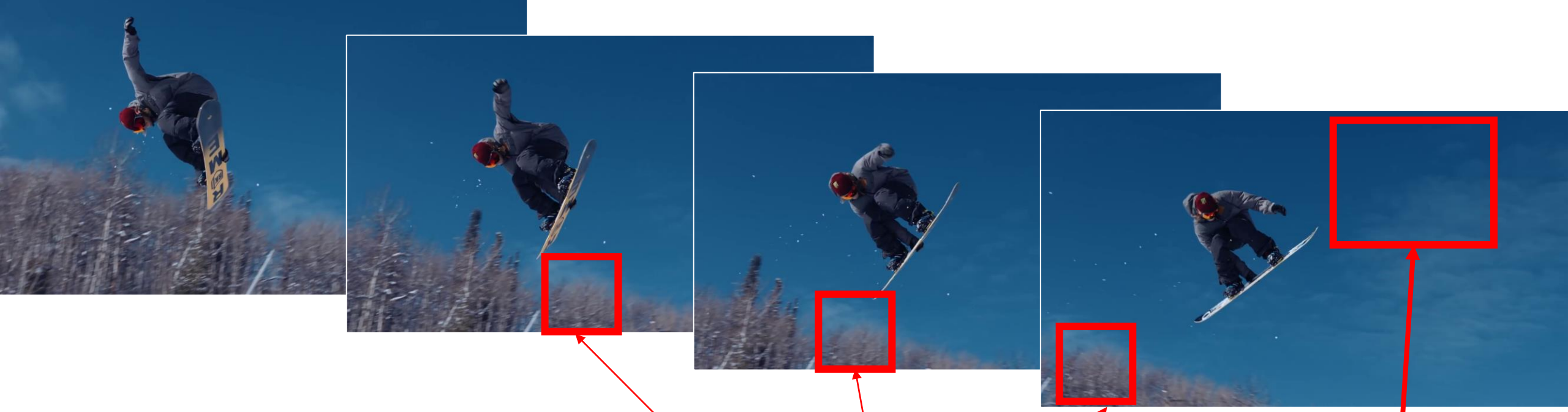
2021

Pixels → Images → Video



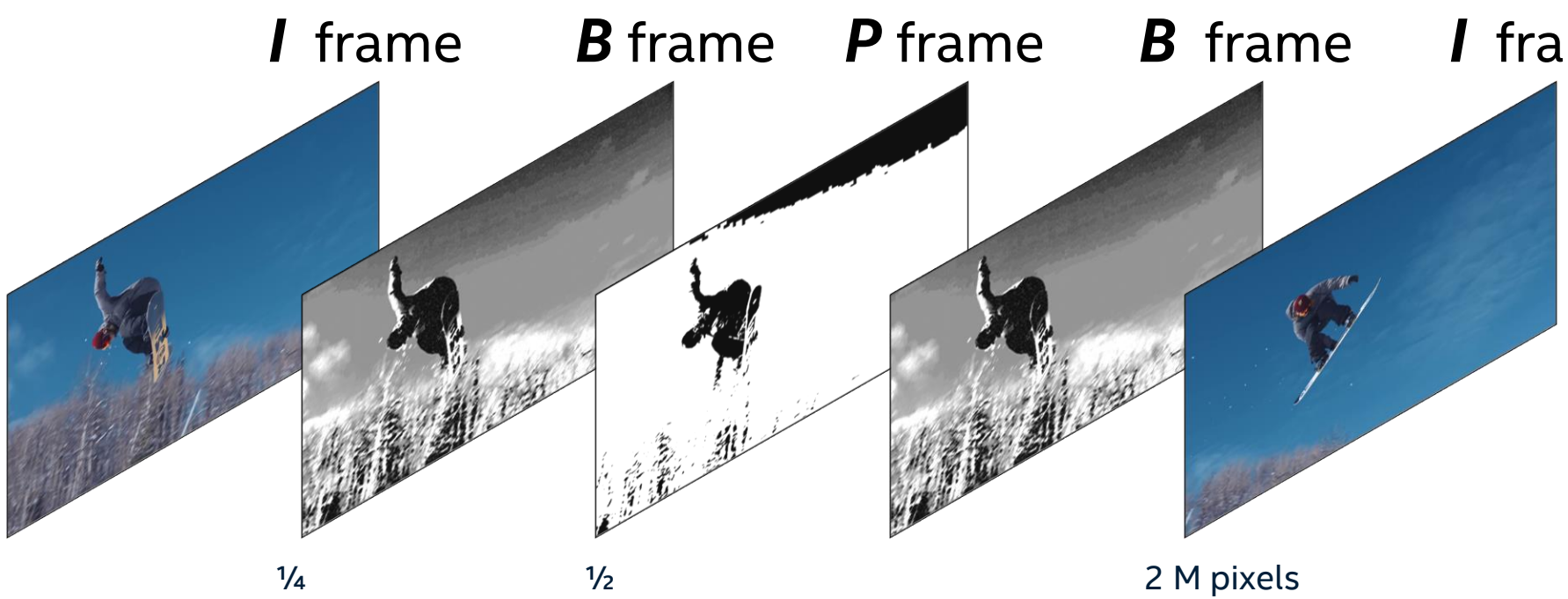


features



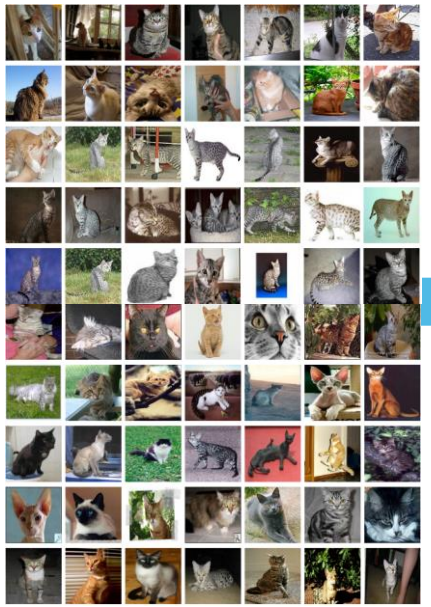
Temporal redundancy

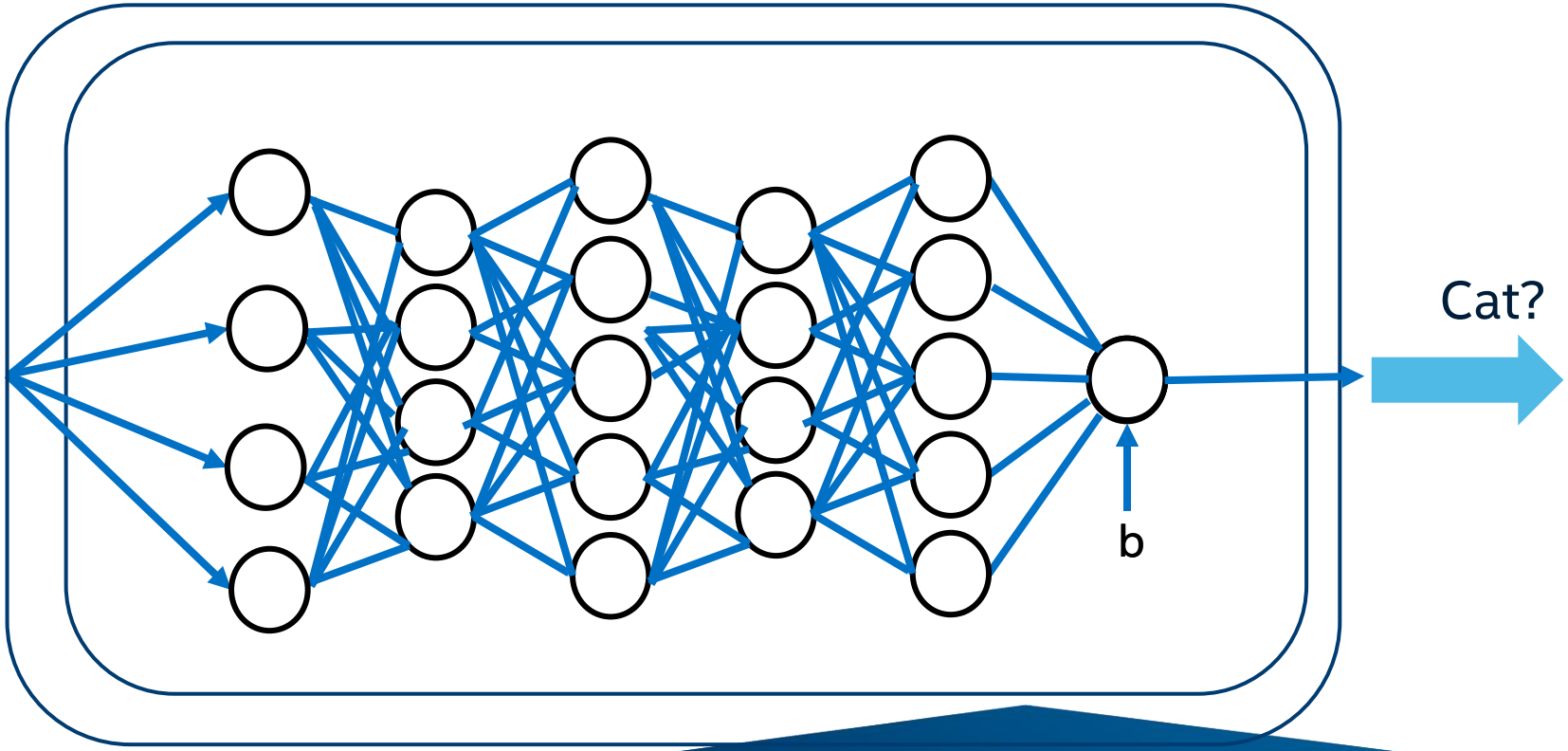
Spatial Redundancy


I frame
B frame
P frame
B frame
I frame
¼
½
2 M pixels

Forward. Classify/Infer →Define Error

INFERENCE





"PER FRAME"

Decode → Pre Processing → Inference → Post Processing → Encode

Inference

- Use a deep-learning based model to inference
- Could be multiple models

Intel® Distribution of OpenVINO™ toolkit

Deep Learning

Intel® Deep Learning Deployment Toolkit

Model Optimizer
Convert & Optimize

IR

Inference Engine
Optimized Inference

IR = Intermediate Representation file

Open Model Zoo

40+ Pretrained Models

Samples

Model Downloader

Calibration Tool | Benchmark app | Model Analyzer | Accuracy Checker | Aux. Capabilities

Traditional Computer Vision

Optimized Libraries & Code Samples

OpenCV*

OpenVX*

Samples

For Intel® CPU & GPU/Intel® Processor Graphics

Tools & Libraries

Increase Media/Video/Graphics Performance

Intel® Media SDK
Open Source version

OpenCL™ Drivers & Runtimes

For GPU/Intel® Processor Graphics

Optimize Intel® FPGA (Linux* only)

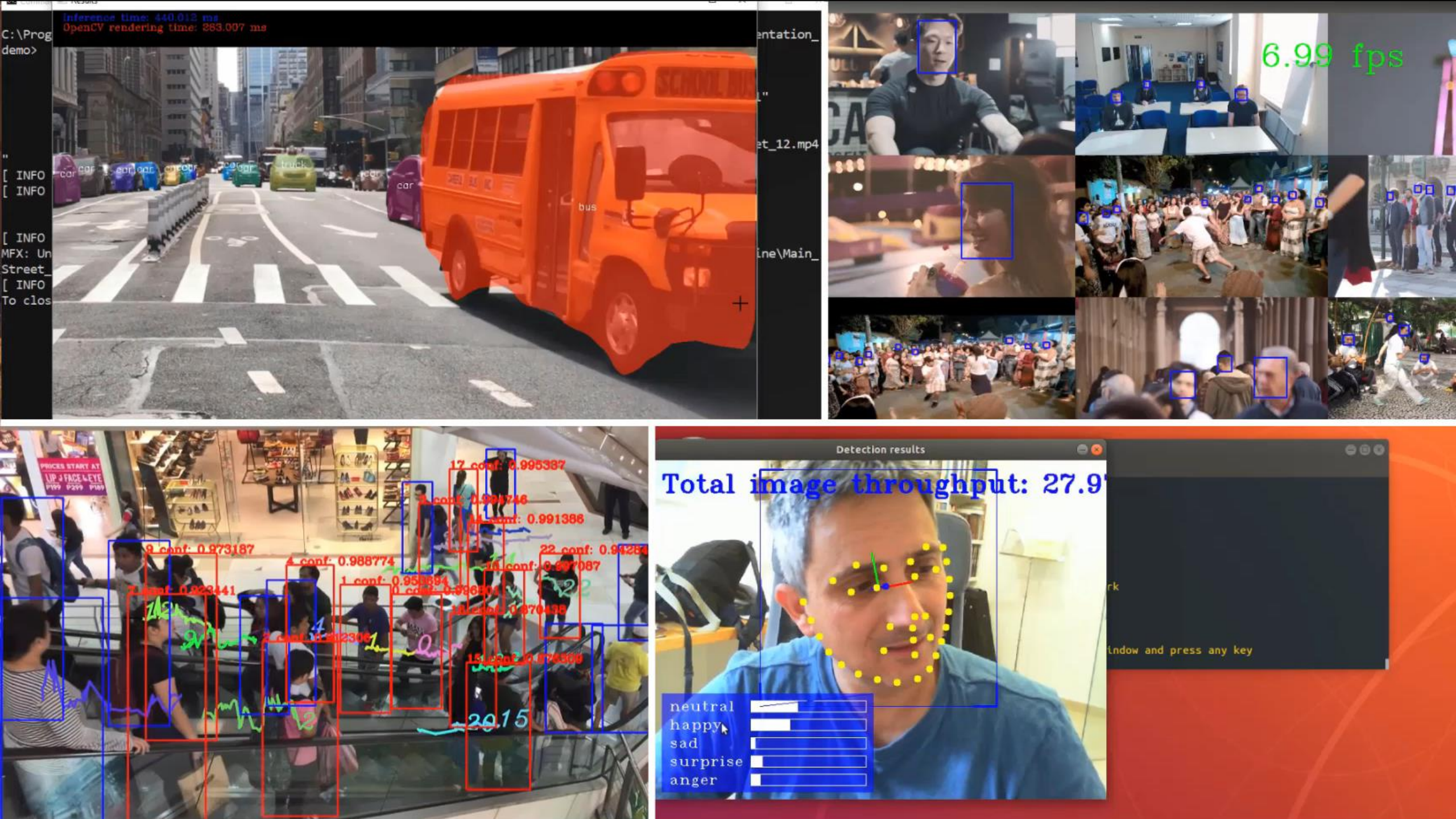
FPGA RunTime Environment
(from Intel® FPGA SDK for OpenCL™)

Bitstreams

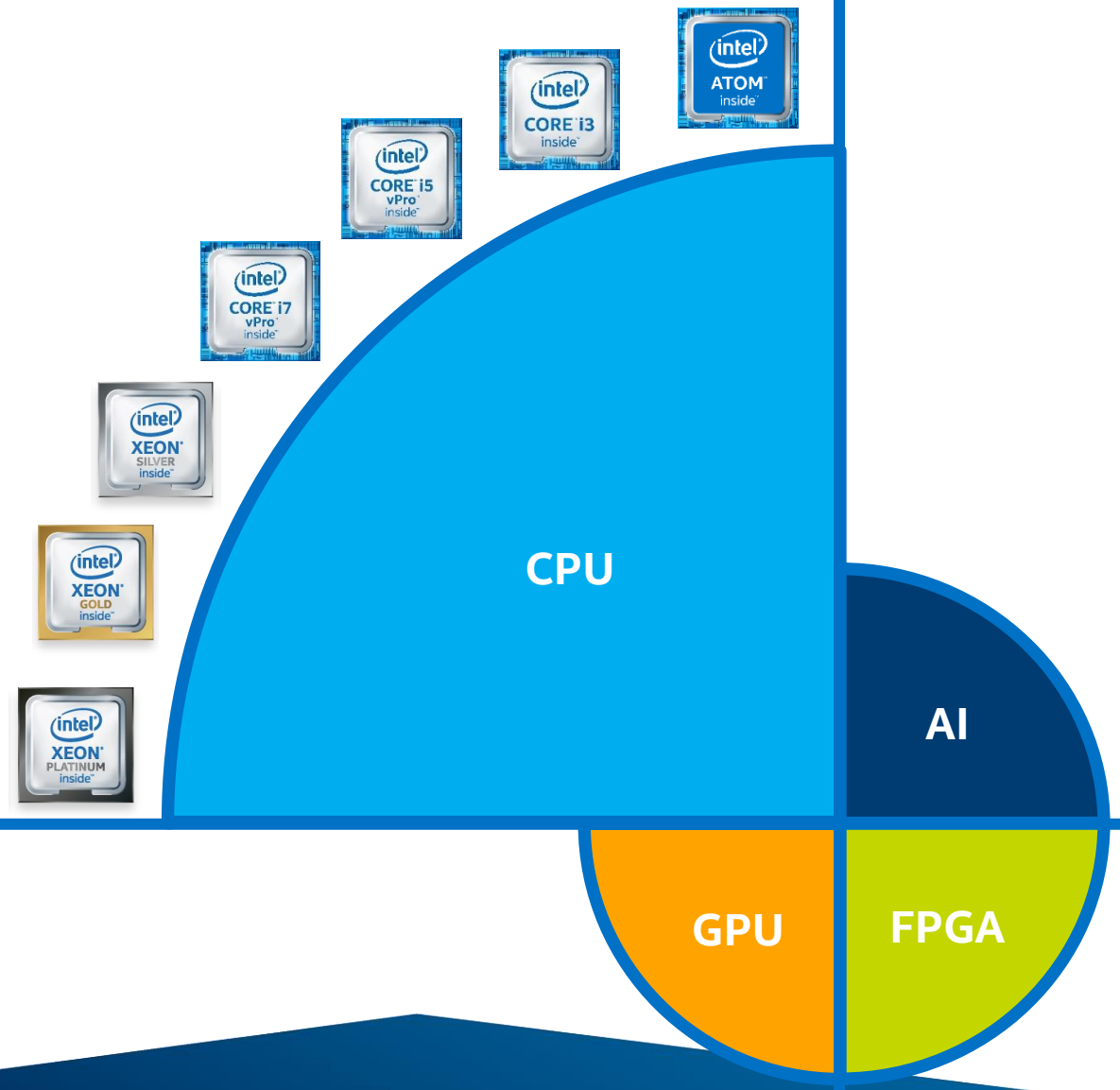
Intel® Architecture-Based Platforms Support

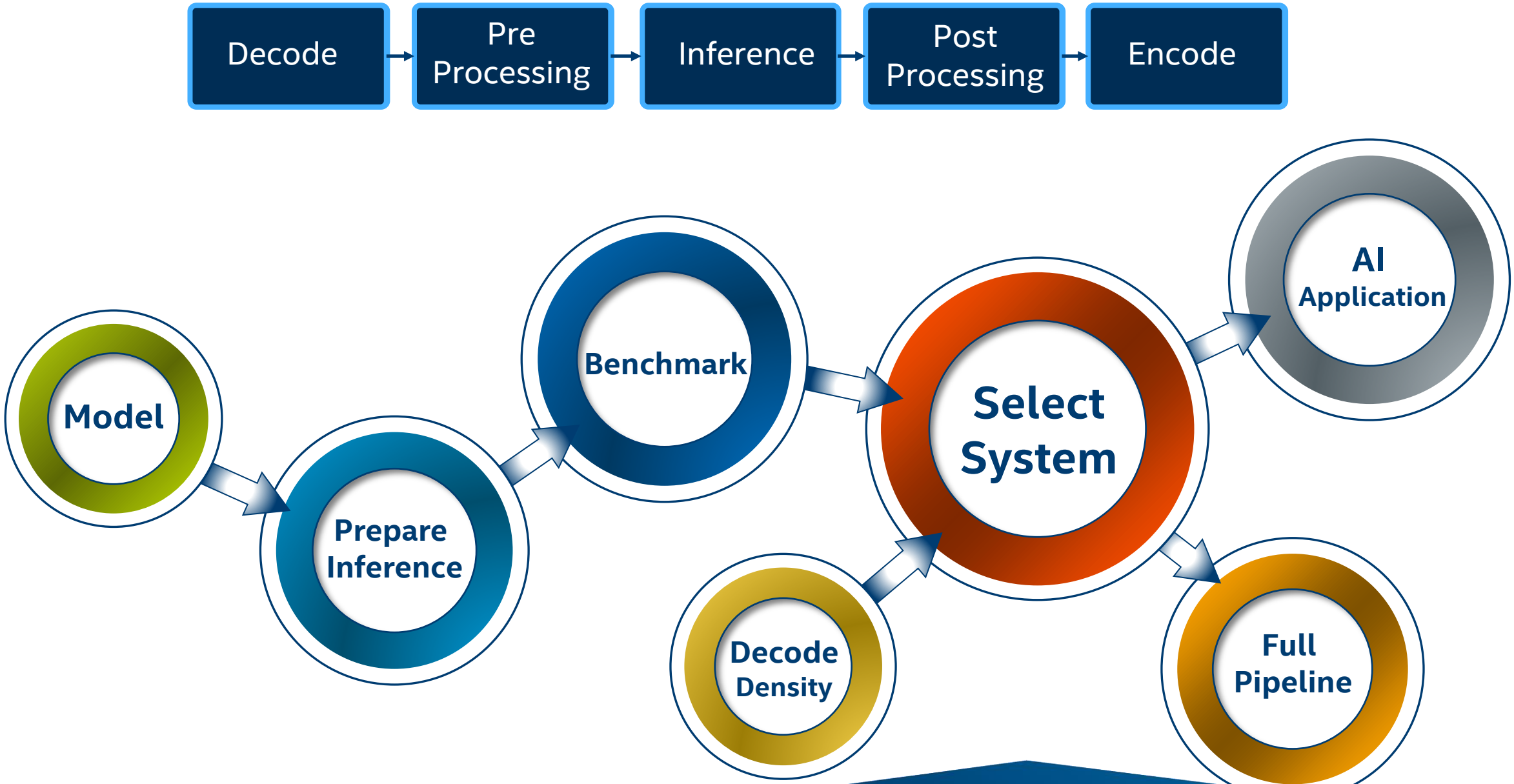
Intel® Vision Accelerator Design Products & AI in Production/ Developer Kits

OS Support: CentOS* 7.4 (64 bit), Ubuntu* 16.04.3 LTS (64 bit), Microsoft Windows* 10 (64 bit), Yocto Project* version Poky Jethro v2.0.3 (64 bit), macOS* 10.13 & 10.14 (64 bit)

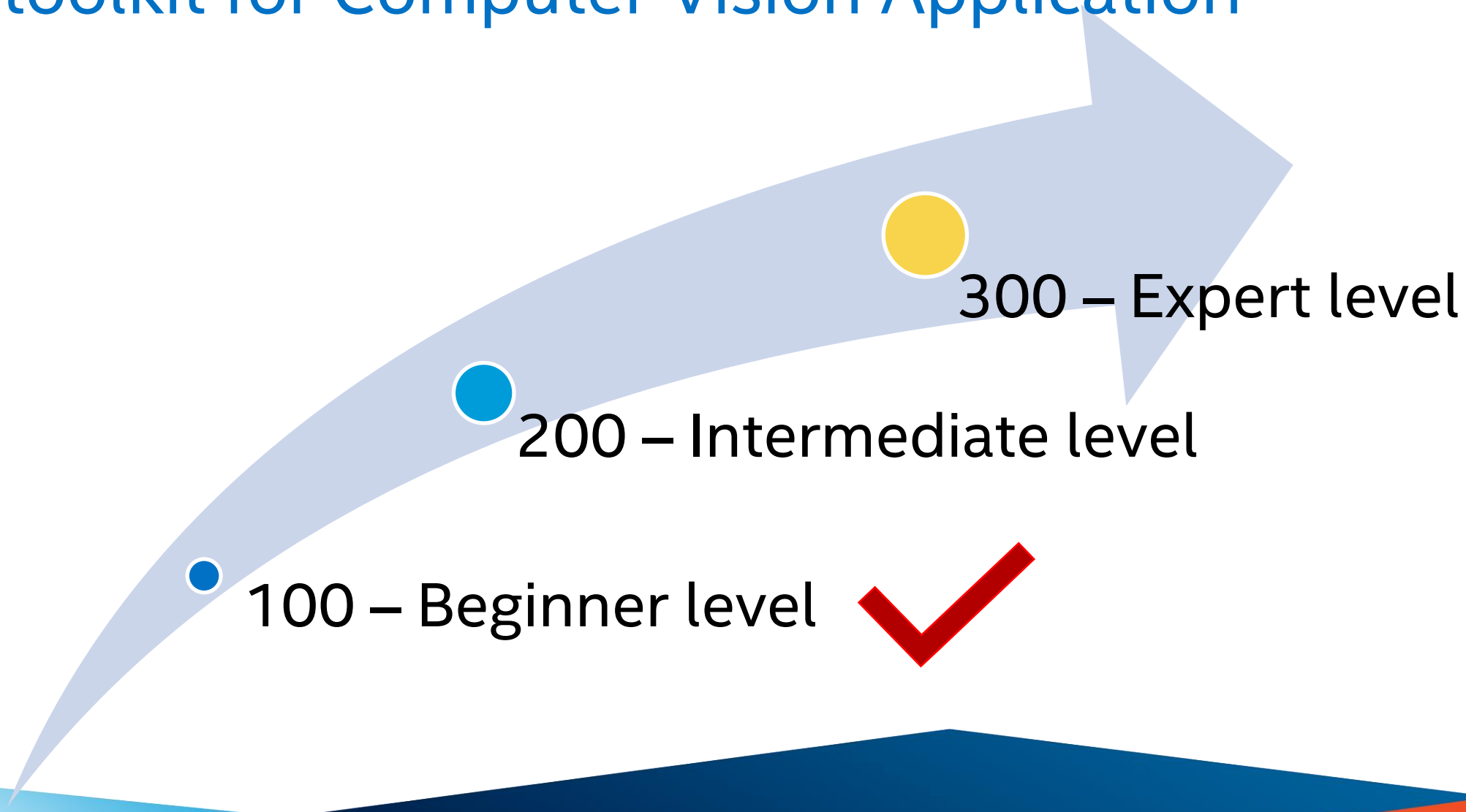

Inference time: 440.012 ms
OpenCV rendering time: 283.007 ms
C:\Prog
demo>
[INFO
[INFO
[INFO
MFX: Un
Street_
[INFO
To clos
entation_
et_12.mp4
ine\Main_
car
truck
bus
6.99 fps
17 conf: 0.995337
14 conf: 0.991386
9 conf: 0.973187
4 conf: 0.988774
22 conf: 0.94283
Detection results
Total image throughput: 27.9
neutral
happy
sad
surprise
anger
rk
indow and press any key

	ResNet50 Infer/sec	MobileNet-SSD Infer/sec
Apollo-Lake	8	20
Coffee-Lake i3	80	170
Coffee-Lake i7	134	300
Cascade-Lake	1500	2500




Decode
Pre Processing
Inference
Post Processing
Encode
Model
Prepare Inference
Benchmark
Decode Density
Select System
AI Application
Full Pipeline

PLEASE FIND A BETTER, AND LEGAL IMAGE HERE !!!

VectorStock®
VectorStock.com/24844058

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