O’REILLY AI CONFERENCE

DELIVERING AI VISION ECOSYSTEM OFFERS WITH INTEL® AI: IN PRODUCTION

September 12, 2019
AI technologies are evolving fast and growing increasingly critical to firms' ability to win, serve, and retain customers. …strategic technologies for 2019 with the potential to drive significant disruption and deliver opportunity over the next five years. …70% of CIOs will aggressively apply data and AI to IT operations, tools, and processes by 2021.

THE TIME TO BEGIN AI ADOPTION IS NOW

*Other names and brands may be claimed as the property of others
Source: https://www.idc.com/getdoc.jsp?containerId=prUS44420918

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MOVING AI COMPUTE TO THE EDGE
BANDWIDTH, STORAGE, LATENCY, SECURITY

43% share of AI tasks taking place on edge devices (vs. cloud) in 2023¹

15X growth in devices with edge AI capabilities by 2023¹

CHALLENGES REMAIN...

TECHNOLOGY EXPLOSION
LACK OF HARDENED DEVELOPER OFFERINGS
VERTICAL SPECIFIC REQUIREMENTS
FRAGMENTED, COMPLEX LANDSCAPE

AI IN PRODUCTION ECOSYSTEM OFFERS WITH INTEL

**BUILD**
your deep neural network models where desired

**DEPLOY**
Complete Reference Applications Pilots to Production

**SCALE**
Cloud to Edge AI: In Production Products and solution offers

Intel® Neural Compute Stick 2h

Intel® RFP Ready Kits

Intel and Partner AI Development and Foundation Kits

Intel® Vision Reference Design Products
BREADTH OF INTEL PRODUCTS
UNLEASHING AI AT THE EDGE

OPENVINO
VISUAL INFERENCE & NEURAL NETWORK OPTIMIZATION

MAXIMIZE PERFORMANCE • DEPLOY TO CPU, GPU, FPGA & VPU ACCELERATORS • LEVERAGE COMMON ALGORITHMS

INTEL COMPUTE + INTEL VISION ACCELERATORS

CORE CORE
GPU
CORE CORE

VPU

FPGA

INTEL
MOVIDIVUS
inside

INTEL
ARRIA 10
inside
**Prototype AI at the Edge**

**Intel® Neural Compute Stick 2**

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**Discover Efficiencies**
Deploy exceptional performance per watt per dollar at the edge for AI inferencing

Operate without cloud compute dependence

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**Develop However You Want**
Start quickly with USB plug-and-play simplicity on Win10® or Ubuntu®

Prototype with low-cost edge devices, such as Raspberry PI® 3 and other ARM®-host devices

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**Prototype with Versatility**
Develop using common frameworks, such as TensorFlow®, Caffe®, MXNet® and ONNX®, and out-of-box sample applications using Intel® Distribution of OpenVINO™ toolkit

Write once and deploy everywhere with Intel® Distribution of OpenVINO™ toolkit starting with the Intel® NCS 2 and then onto an Intel® Movidius™ Myriad™ X VPU-based embedded device
INTEL® VISION ACCELERATOR DESIGN PRODUCTS DELIVERED BY ECOSYSTEM PARTNERS

EXAMPLE CARD BASED ON VISION ACCELERATOR DESIGNS

- 1 Movidius VPU
- 2 Movidius VPUs
- 8 Movidius VPUs
- Intel® Arria® 10 FPGA 1150GX

INTERFACE

- M.2, Key E
- miniPCle*
- PCIe x4
- PCIe x8

CURRENTLY MANUFACTURED BY*

INTEL® DISTRIBUTION OF **OpenVINO** TOOLKIT

Develop NN Model; Deploy across Intel® CPU, GPU, VPU, FPGA; Leverage common algorithms

*Please contact Intel representative for complete list of ODM manufacturers. Other names and brands may be claimed as the property of others.

Optimization Notice
### Ecosystem Portfolio: Ingredients

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<th>CSP Edge Offerings</th>
<th>Software</th>
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<td><strong>Intel® Movidius™ Myriad™ X VPU</strong></td>
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<td>- Gorilla Technology Intelligent Video Analytics Recorder (IVAR)</td>
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<td>- Mobiliya Technologies ThirdEye Vision Analytics Platform</td>
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<td>- TinyGO AI Edge Module Kit</td>
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Step 1

Begin the AI Inference Journey
Download and explore the Intel® Distribution of OpenVINO™ toolkit to train deep neural network models or experiment with pretrained models to harness the power of edge AI.

- Intel® Distribution of OpenVINO™ Toolkit
- Pretrained Models
- Code Samples
- Reference Implementations

Step 2

Create a Deep Neural Network Prototype
Use a variety of low-power to high-performance kits and tools that include the Intel Distribution of OpenVINO toolkit, such as the Intel® Neural Compute Stick 2 (Intel® NCS 2)

- Intel NCS 2
- Computer Vision Forum
- Support

Step 3

Take Your AI and Vision Product to Market
Streamline your path to production with vision accelerator kits and harness increased acceleration with an Intel® Vision Accelerator Design product. At the same time, move your applications with the Intel Distribution of OpenVINO toolkit.

- Computer Vision Hardware
- IoT Developer Kits
- Exclusive access to Intel® Devcloud
- Intel Vision Accelerator Design Products

intel.com/ai-in-production
The IUCN consider that 38% of South-east Asian reefs had been destroyed, 28% are critically endangered and 29% are endangered.

Studies with a constant destruction rate predict 70% of the worldwide coral reefs destroyed by 2050.

**Why do coral reefs matter?**

- 25% global marine life depends on coral reefs
- ~50% of the Great Barrier Reef has died since 2015
- 0.1% part of the seabed covered with coral reefs
- $30B Annual value of goods & services provided by coral reefs
- $9.6B the economic value of coral reefs derived from tourism & recreation
- 97% wave energy absorbed by coral reefs
- 1B people w/ some dependence on coral reefs for food & income from fishing
- 900K Average annual diver certs given out globally by PADI
- 15 ton the amount of seafood a well-managed km² of coral reef can yield/yr
- 197M Amount of people living below 10m elevation and within 50km of a reef, who might be receiving protection from reefs

**Why are they endangered?**

- $9.6B the economic value of coral reefs derived from tourism & recreation
- 1B people w/ some dependence on coral reefs for food & income from fishing
- 900K Average annual diver certs given out globally by PADI
- 15 ton the amount of seafood a well-managed km² of coral reef can yield/yr
- 197M Amount of people living below 10m elevation and within 50km of a reef, who might be receiving protection from reefs
PROJECT CORAIL: CORAL RESTORATION

Automated reef monitoring solution

An Accenture-developed toolchain, workflow, and set of guidelines for training object detection CNN models.

TrainTracc

TensorFlow

OFFSHORE EDGE

Cloud Centralized Backend

ONSHORE LOCAL Backend

Data sets:
- Fish4Knowledge
- OUT Fish Dataset
- IMAGENET
- FishBase
PROJECT CORAIL: CORAL RESTORATION

AUTOMATED REEF MONITORING SOLUTION

PROTOTYPE FULLY FUNCTIONAL MODULAR AI-POWERED UNDERWATER CAMERA UNIT

that continuously counts the number of visible fauna, and when possible, assign a taxonomy. This will allow for a much more granular and frequent insight of the fish population without disrupting the marine life.

Allowing biologists to study the populations, and thus the reef health, not only enabling tracking of changes over large periods of time, but also changes over the time of the day, different weather conditions, different tide cycles, etc.

Pangatalan Island, the Philippines

PROTOTYPE DEPLOYMENT SITE

Intel Confidential
PROJECT CORAIL: CORAL RESTORATION

Data Collection: One picture every 5 minutes is captured from 5 AM to 7 PM in order to build a relevant dataset. Camera position is changed every few days. An Firmware update is in progress, allowing capture of fishes based on movements detection.
Step 4
Deploy Use-Case-Specific Solutions
Solve critical market challenges in key vertical industries. Drive innovation and faster transitions to IoT solutions with Intel® IoT RFP Ready Kits.

View Intel IoT RFP Ready Kit Solutions for AI

Step 5
Deliver Scalable, End-to-End Solutions
Strengthen delivery through unique support and scaling opportunities with flexible and repeatable solutions with Intel® IoT Market Ready Solution (Intel® IMRS)

View Intel® IoT Market Ready Solutions for AI

Step 6
Leverage Scaling and Support Opportunities
Accelerate time to market and deployment of your complete solutions with Intel® IoT Solution Aggregators that provide scaling and support.

Arrow
Synnex*
World Peace Industrial Group (WPI)
INTEL® IOT SOLUTIONS ALLIANCE

Accelerate your revenue growth with a world-class, solution-centered ecosystem program that bridges the gaps for your IoT solutions and offers multiple ways to scale.

Gain additional benefits as you increase revenue growth of your Intel-based products, services & solutions

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<td>Solutions promotions, Access to content marketing</td>
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<td>Affiliate Member Tier</td>
<td>General benefits +, Co-Marketing (MDF), Special event inclusion, Incremental benefits based on partner type</td>
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<td>Premier Member Tier</td>
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ODM: Designed to accelerate sales by accessing co-selling resources, promotions, go-to-market tools and investments

OEM: Designed to increase visibility and accelerate sales by accessing go-to-market tools and investments

ISVs: Designed to promote software solutions by accessing ecosystem matchmaking opportunities and go-to-market tools

Cloud Service Providers: Coming in 2019, an invitation-only program for top CSPs to help align products and co-development of new initiatives leading to edge-to-cloud deployments for their companies

Leverage integrated initiatives to help get your solutions to market

For partners with edge-to-cloud offerings:

**Market Ready Solutions**
Targeted program to validate and accelerate complete edge-to-cloud IoT solutions that are truly ready for the market.

**RFP Ready Kits**
Targeted program for focused technology offerings that solve a class of market problems, have been deployed and tested in the field, and provide bundled hardware, software, and support.

For strategic segment partners:

**Segment-driven Specialist Initiatives: Machine Building, Retail & Video**
Coming in 2019, segment-driven specialist initiatives created to harness Intel and partner expertise to scale business and accelerate revenue within a select business focus area.

Qualifying partners access tiered program benefits along with the value-add targeted initiatives' offerings.
Intel® IoT RFP Ready Kits are commercially-hardened, ready-for-customer solution kits built for scale into customer deployments. To apply for joint scaling opportunities go to: www.intel.com/marketreadysurvey

Intel® IoT RFP Ready Kit criteria include...

- Features commercial grade components, customizable APIs, a verified distribution, pricing model and support
- Turnkey kit is available for purchase today and built for scale tomorrow

Intel® IoT RFP Ready Kits enable customers to:

- Offload testing and development costs by leveraging pretested RKK kits to estimate deployment demands
- Accelerate time to market by overcoming deployment barriers with concrete, tangible kits that can be tried today
- Gain initial customer wins with kits that appeal to specific industry problems and customer environments

Intel® IoT RFP Ready Kits apply to a variety of use cases across:

- Smart Building
- Embedded Vision
- Asset Tracking
- Precision Agriculture
- Digital Signage
- Smart Vending
- Smart Home
- Predictive Maintenance
- Farming
- Smart Retail
Intel® IoT Market Ready Solutions are end-to-end solutions built on Intel® platforms and verified by Intel’s Core Initiative team to ensure they are hardened, scalable, and supported. To apply for joint scaling opportunities go to: www.intel.com/marketreadysurvey

Intel® IoT Market Ready Solutions are:
- Tailored to industry specific business problems
- Pre-integrated and in production today
- Designed to accelerate ROI

Intel® IoT Market Ready Solutions make it easier for:
- Customers to realize solution value
- Solution partners to get solutions to market
- Integrators to implement solutions

Intel® IoT Market Ready Solutions apply to a variety of use cases across:
- Connected Retail
- Building Management
- Energy Monitoring
- Connected Worker
- Connected Factory
- Health & Wellness
- Connected Transportation
- Predictive Maintenance
- Logistics & Asset Management
- Inventory Management
- Visual Displays
- Video Monitoring
- Outdoor Lighting
- Smart Cities

Connected
Retail
Building
Management
Energy
Monitoring
Connected
Worker
Connected
Factory
Health & Wellness
Connected
Transportation
Predictive
Maintenance
Logistics & Asset Management
Inventory Management
Visual Displays
Video Monitoring
Outdoor Lighting
Smart Cities
COLLABORATION WITH PARTNERS

EQUIPMENT PROVIDERS
Deliver a system with Intel CPU, iGPU, VPU or FPGA, including Intel® Vision Accelerator Design products working with Intel® Distribution of OpenVINO™ toolkit.
Deliver an Intel Architecture-based smart camera system

SYSTEM INTEGRATORS
Deploy, integrate and service end-to-end AI at the Edge systems with Intel® Vision Products, and provide level 1 support

SOFTWARE AND ANALYTICS PROVIDERS
Provide a commercial offering built on the Intel® Distribution of OpenVINO™ toolkit

SOLUTION AGGREGATORS
Provide inventory management for Intel® Vision Products, and training and support on Intel® Vision Products

CLOUD SERVICE PROVIDERS
Integrate Intel® Vision Products with edge IoT platforms and AI tools for developers
IOTG Channels | Vision Ecosystem & Offerings

INTEL® AI: IN PRODUCTION

DEVELOP GET-TO-MARKET

- Access to Intel trainings and workshops
- Access to Intel technologies and tools, such as
  - Intel® Distribution of OpenVINO™ toolkit
  - Intel® Neural Compute Stick 2
  - Intel® Vision Accelerator Design products
- Exclusive access to Intel® Devcloud
- Offer co-creation opportunities
- Access to technical support

SCALE GO-TO-MARKET

- Access to Intel ecosystem programs
  - Intel® IoT Solutions Alliance
  - Intel® IoT RFP Ready Kits
  - Intel® IoT Market Ready Solutions
  - Intel® IoT Solution Aggregators
- Amplification of your brand and offerings with Intel
  - Joint marketing collateral
  - Key industry event participation opportunities
- Partner and solution matchmaking

intel.com/ai-in-production
This is AI in production delivering results.

Worker safety
Access control

Shopper traffic
Mapping

Smart manufacturing

Smart cities

Video analytics
Solution

Security for 2018 World Cup stadiums

Remote monitoring solution

Public transport monitoring

Facial recognition

Macular degeneration detection

Smart surveillance

Smart manufacturing

Smart robotics
INTEL® AI BUILDERS PROGRAM PARTNERS

avaamo
IBM
maxQ®
sparkcognition™
L&T Technology Services
wrnch
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<td>END-TO-END DATA ANALYTICS: COLLECT, ORGANIZE, ANALYZE, &amp; INFUSE</td>
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MaxQAI’s ACCIPIO® Ix Intracranial Hemorrhage (ICH) Platform, the complete ICH solution for stroke and head trauma assessment, is designed to greatly increase ICH detection and reduce missed ICH through near real-time triage, annotation and diagnostic rule-out. The demo will showcase the complete ACCIPIO® platform, which is seamless from the start with a fully automated solution that provides identification & prioritization to support the Radiologist, Emergency Room and Neuro-rad teams with a fully-automated solution. Learn more in the Intel on AI podcast, take a look at the blog post on DL algorithms in the acute-care marketplace, and learn about the latest enhancement of the ACCIPIO® ICH Platform.

Learn how to simplify and automate how your organization turns data into insights within a design using IBM Cloud Pak™ for Data. Make data simple and accessible, create a business-ready analytics foundation, build and scale AI with trust & transparency, and operationalize AI throughout the business. Check out this demo to see how Cloud Pak™ can be customized to your unique data landscape.

The most successful IoT ecosystems are those utilizing best in class software and hardware to support complex layers of advanced analytics and AI techniques to derive the best possible intelligence and value for the best ROI. This demo will showcase SAS managing and orchestrating its advanced analytics and AI capabilities from edge to enterprise through streaming analytics from SAS supported by Intel’s latest advancements in computer vision hardware.

Despite technological advancements, traditional engineering companies have been very slow in digital adoption. The task of digitalizing legacy data, which when done manually is both time-consuming and cost-intensive activity. The AiKno® Meta Data Extraction solution helps in solving the challenge of extracting metadata from noisy and unstructured legacy scanned documents and converting the unstructured data into a structured format.

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Custom-build novel, elegant machine learning models that act directly on your data to extract actionable business insights in less time than traditional data science methods. SparkCognition’s AutoML solution Darwin, empowers you with productive workflows to make your data ready for the machine learning process and quickly optimize, deploy, and maintain thousands of models from a single environment.

Avaamo will showcase a live conversation with UCHealth’s virtual assistant, “Livi.” During this demo, they will discuss how AI techniques are implemented, time to deployment, and how UCHealth has been able to successfully automate the patient experience in a personalized and, surprisingly, very human way. Learn more about Avaamo’s conversational AI solution: listen to the podcast, see the demo in action, and read more in the solution brief.

wrnch is the world software engineering leader in using AI and deep machine learning to teach cameras how to understand human motion and activity in video, through a frictionless motion capture and activity recognition experience to digitize human. Located in Montreal, Canada, a renowned deep learning hub for AI, wrnch is changing how we interact with the world, each other and AI; making our lives safer, healthier and of course, more fun!

GE HEALTHCARE’S ARTIFICIAL INTELLIGENCE PRESCRIPTION (AIRX™) IS A 510(K)-APPROVED AUTOMATED WORKFLOW TOOL USING ARTIFICIAL INTELLIGENCE (AI) TO PRECISELY IDENTIFY AND ALIGN MR SCANS FOR DIAGNOSTIC NEUROIMAGING. GE HEALTHCARE PARTNERED WITH INTEL TO OPTIMIZE THE INFERENCE SPEED OF AIRX™ ON THEIR EXISTING INTEL® XEON® CPU-BASED PLATFORMS. USING SOFTWARE OPTIMIZATION, INCLUDING THE INTEL® DISTRIBUTION OF OPENVINO™ TOOLKIT, GE HEALTHCARE REDUCED THE TOTAL INFERENCE TIME FROM 2.85 SECONDS TO 0.659 SECONDS WITHOUT THE ADDITIONAL COST OF HARDWARE ACCELERATORS.
PROTOTYPE TO PRODUCTION
INTEL® AI: IN PRODUCTION

Welcome

AI at the Edge partners

• Want to build, deliver, deploy, or service AI solutions
• Need easily accessible tools and resources
• Want to find other solution partners to work with
• Need to shorten time to market

Develop Get-to-Market

Build solutions with Intel’s portfolio of software and hardware products

Increase knowledge of AI with trainings and workshops

Access resources for AI inference all in one place

Jumpstart development with essential AI development kits

Join

Demonstrate value by delivering ingredients other partners need

Differentiate portfolio by transforming solutions into targeted, marketable solutions

Match make with complementary partners

Discover new marketing avenues, and increase reach and exposure

Scale Go-to-Market

Join intel® Ai: in production

intel.com/ai-in-production
THANK YOU
ADDITIONAL REFERENCE SLIDES