

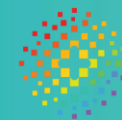


# Welcome – Sept. 17

Jeff Bier

Edge AI and Vision Alliance

September 2020



edge ai + vision  
**ALLIANCE**

# Patterson Keynote – My Takeaways

- Domain-specific architectures (DSAs) are the way forward
- Domain-specific languages are key to exploiting DSAs
- Importance of the software stack
- Raising the hardware/software interface enables processor innovation
- Less is more: It's harder to come up with simple solutions, but they accelerate progress
- Take the time for a quantitative approach
  - Good benchmarks are essential
- The market is impatient!

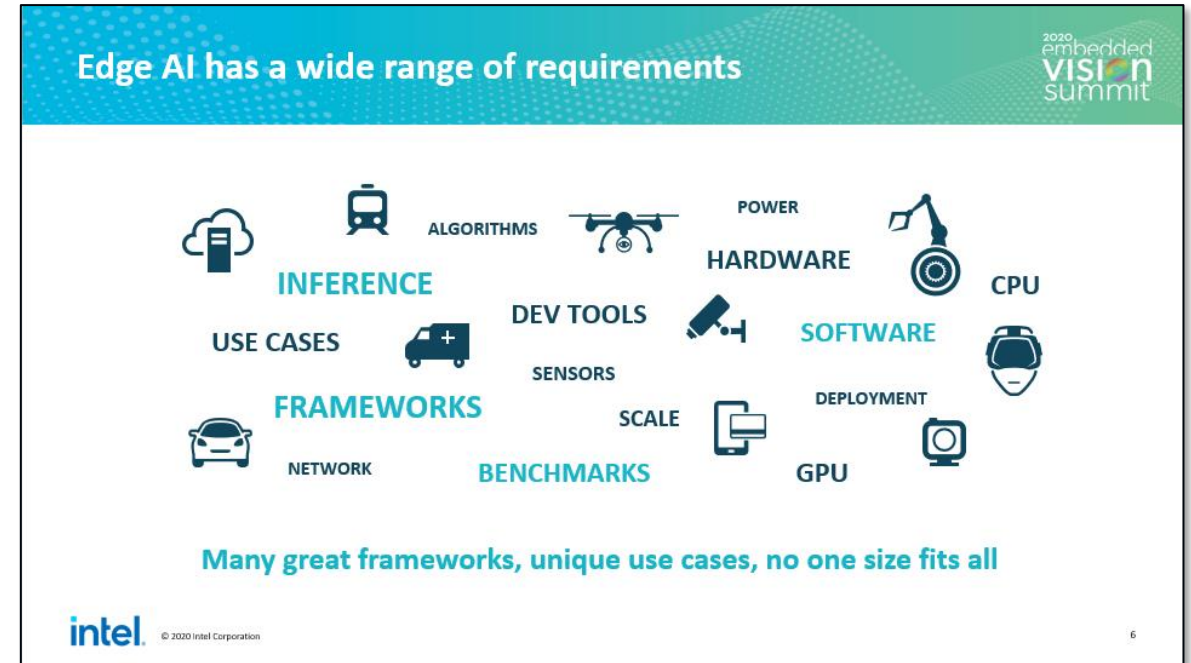


**David Patterson**  
Professor, UC Berkeley



# Bill Pearson – Intel: Complex Choices

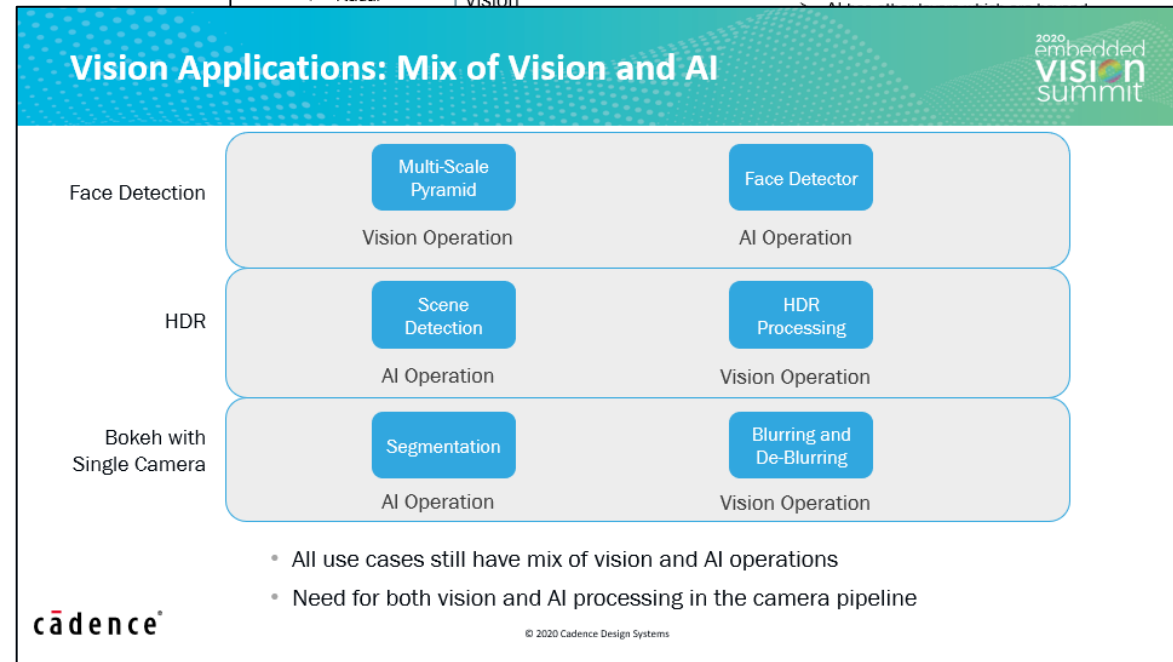
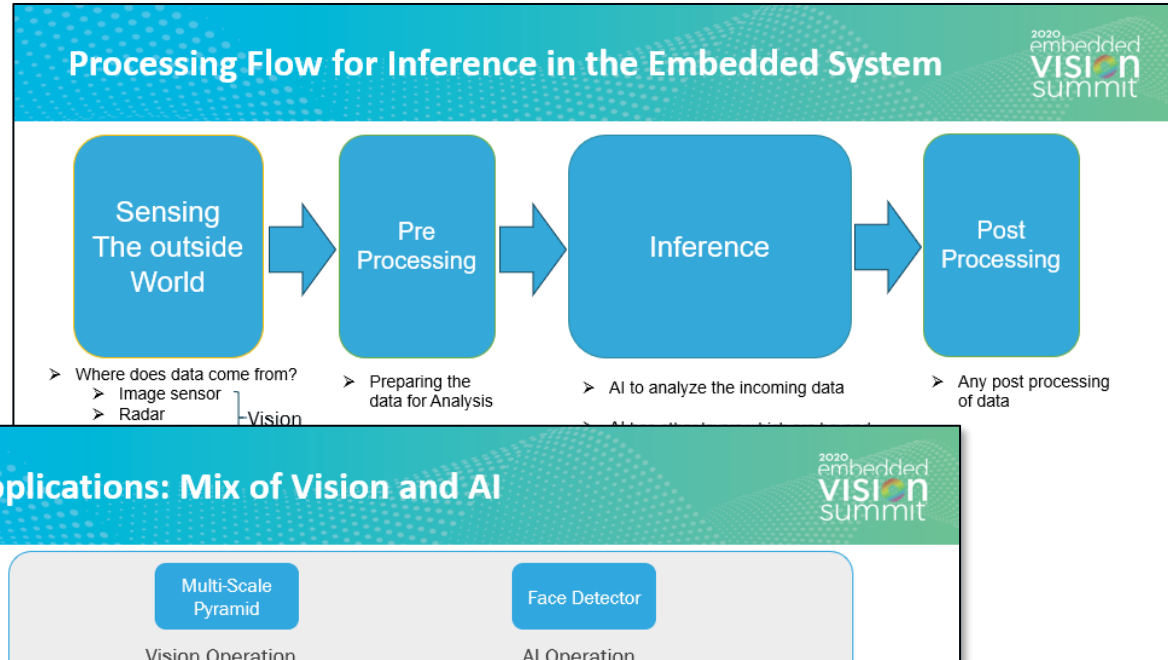
- 43% of AI tasks will occur on edge devices (vs. cloud) in 2023
- 15X growth in devices with edge AI capabilities by 2023
- Diverse edge AI applications with diverse requirements...
- ...no one-size-fits-all solution
- Appropriate benchmarks are key
- DevCloud for the Edge provides a quick start



Source:  
Bill Pearson,  
Intel

# Pulin Desai – Cadence: Heterogeneity

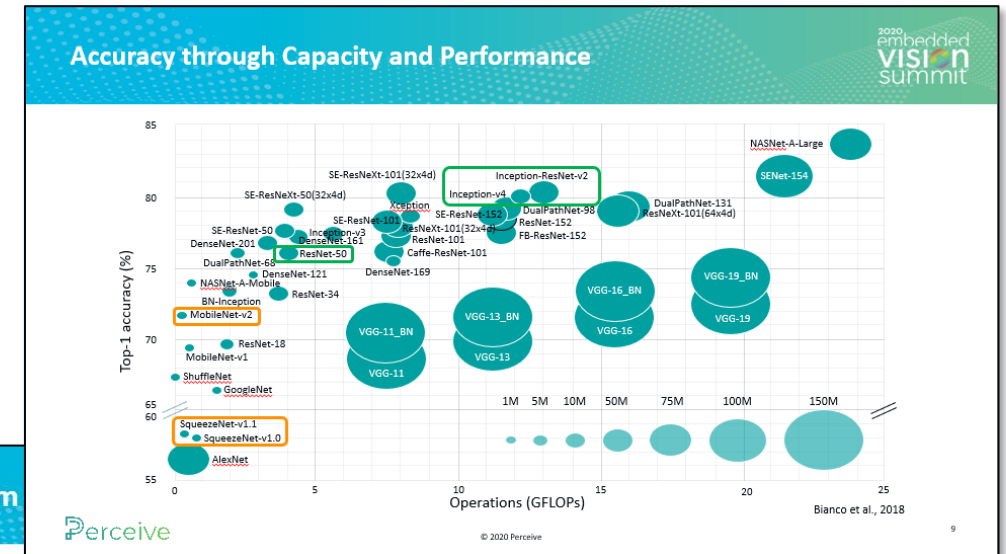
- Inference  $\neq$  application!
- Real edge AI applications typically combine inference with pre-processing (e.g., filtering) and post-processing (e.g., tracking)
- Important implications for tools, processors, and skills



Source:  
Pulin Desai, Cadence

# Steve Teig – Perceive: High Efficiency Edge Processing

- Edge processor preferred due to cost, latency, power, security and privacy
- High accuracy on demanding tasks requires large DNNs...
- ...which require high performance
- Encrypt your networks to protect your IP



## The problem

Today's consumer camera/doorbell streams everything to the cloud



Significant costs to user & provider



Perceive

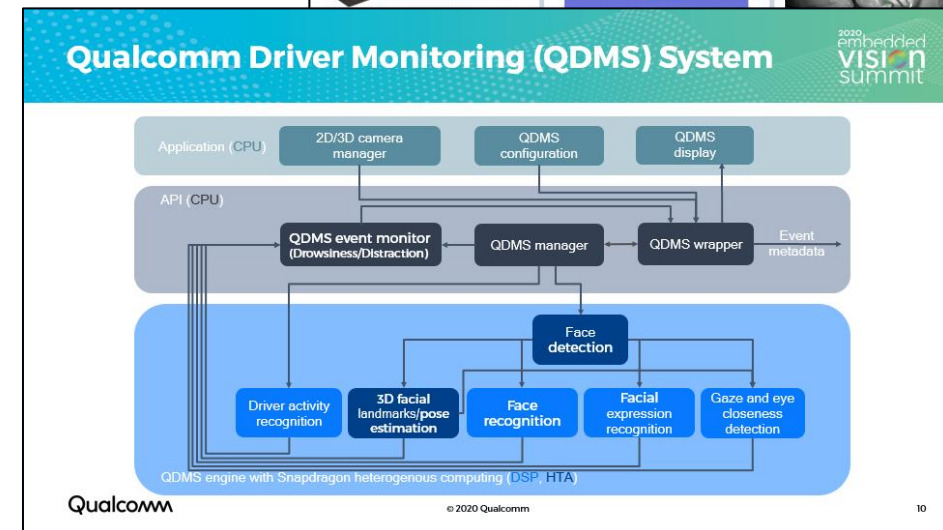
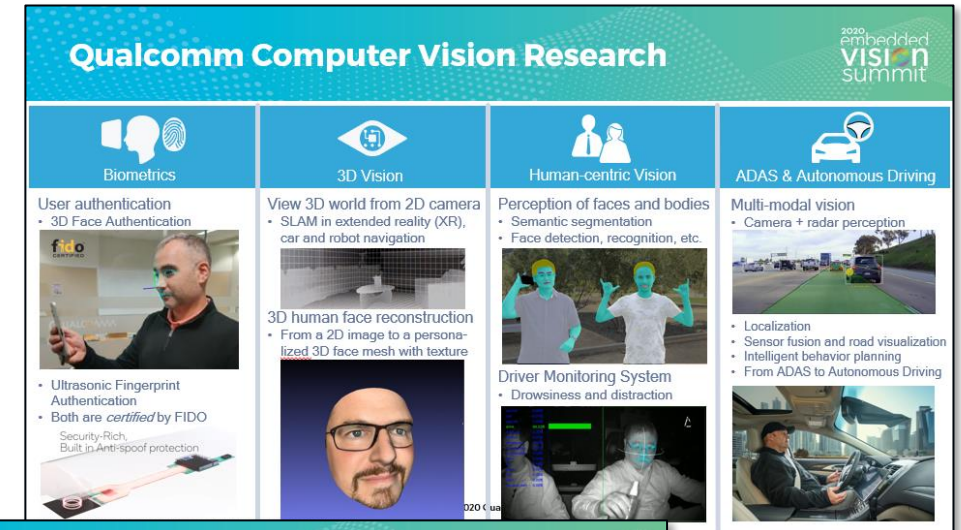
© 2020 Perceive

Source:  
Steve Teig, Perceive



# Ning Bi – Qualcomm: Research and Applications

- Qualcomm is investing in fundamental research in visual AI
- Visual AI use cases in automotive are multiplying – including monitoring driver and passengers for safety



Source:  
Ning Bi, Qualcomm

# Ning Bi – Qualcomm: Research and Applications

- Qualcomm is i
- research in vis
- Visual AI use c
- multiplying – i
- driver and pas



**ion Research**

2020 embedded VISION summit

Human-centric Vision	ADAS & Autonomous Driving
<p>Perception of faces and bodies</p> <ul style="list-style-type: none"><li>• Semantic segmentation</li><li>• Face detection, recognition, etc.</li></ul>  <p>Driver Monitoring System</p> <ul style="list-style-type: none"><li>• Drowsiness and distraction</li></ul> 	<p>Multi-modal vision</p> <ul style="list-style-type: none"><li>• Camera + radar perception</li></ul>  <ul style="list-style-type: none"><li>• Localization</li><li>• Sensor fusion and road visualization</li><li>• Intelligent behavior planning</li><li>• From ADAS to Autonomous Driving</li></ul> 

2020 embedded VISION summit

Event metadata

and eye ness cion

Qualcomm

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10



# Today's Schedule

9:00-10:30 am PT

**Opening Remarks, Presentations and Q&As**

10:30 am-1:00 pm PT

**Product Presentations  
and Q&A Sessions**

10:30 am-1:00 pm PT

**Staffed Exhibit Booths**

1:00-2:00 pm PT

**Presentations and Q&As**



# Conference Tracks

## FUNDAMENTALS

### FUNDAMENTALS

#### Can You See What I See? The Power of Deep Learning



**Scott Thibault, PhD**  
StreamLogic

🕒 9:30 AM - 10:00 AM PDT

DATA

APPLICATIONS

DEEP NEURAL NETWORKS

## ENABLING TECHNOLOGIES

### ENABLING TECHNOLOGIES

#### Machine-Learning-Based Perception on a Tiny, Low-Power FPGA



**Hoon Choi**  
LATTICE SEMICONDUCTOR

🕒 10:30 AM - 11:00 AM PDT



PROCESSORS

ALGORITHMS

## TECHNICAL INSIGHTS

### TECHNICAL INSIGHTS

#### Practical DNN Quantization Techniques and Tools



**Raghuraman Krishnamoorthi**  
Facebook

🕒 9:30 AM - 10:00 AM PDT

DEEP NEURAL NETWORKS

## BUSINESS INSIGHTS

### BUSINESS INSIGHTS

#### Can You Patent Your AI-Based Invention?



**Thomas Lebens, Esq.**  
Fitch, Even, Tabin & Flannery, LLP

🕒 1:30 PM - 2:00 PM PDT

BUSINESS

# Exhibit Hours

## STAFFED EXHIBIT BOOTH HOURS

**Tuesday, Sept 15**

10:30 am – 1:00 pm PT

**Thursday, Sept 17**

10:30 am – 1:00 pm PT

## SPECIAL ASIA BOOTH HOURS

**Tuesday, Sept 15**

6:00 pm – 8:00 pm PT

(Wednesday, Sept 16,  
9:00 – 11:00 am China Standard Time)

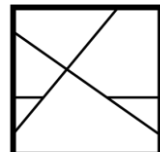
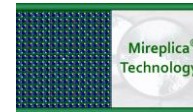
## SPECIAL EUROPE BOOTH HOURS

**Thursday, Sept 17**

7:00 am – 9:00 am PT  
(4:00 – 6:00 pm Central European Time)

# Exhibitors

2020  
embedded  
VISION  
summit



RAMONA OPTICS





# Finding Exhibitors

The screenshot shows the website for the 2020 Embedded Vision Summit. The top navigation bar includes links for Home, Schedule, People, Sponsors, Exhibitors, Conversations, Summit Rewards, Upgrade, Support, and Account. A search bar is located in the top right corner. Below the navigation bar, a grid of exhibitor cards is displayed, organized into three rows (A, B, and C). Each card features the company logo, name, and a list of roles (e.g., Intel Partner, Alliance Member, Exhibitor, Gold Sponsor). A sidebar on the right side of the grid contains a search bar and a list of filters. The filters include a 'Search' bar, a 'GO' button, and a list of categories: Type, Live Chat, Description, Name, Markets Served, and Products or Services Provided. The 'Products or Services Provided' section is expanded, showing a list of tags such as Software and Algorithms, ICs and SoCs, Development Tools, Cameras, Silicon IP, Design and Manufacturing Services, Processor Boards & Modules, Image and Video Data, Camera Modules, Sensors, Standards, Market Research, Strategic Consultancy, Mergers and Acquisitions Advisory, Lenses, Open Source, Illumination, and Memory.

2020 embedded  
**VISION**  
summit

Home Schedule People Sponsors Exhibitors Conversations Summit Rewards Upgrade Support Account

A

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brainchip  
Brainchip  
ALLIANCE MEMBER EXHIBITOR

C

cadence  
Cadence Design Systems  
GOLD SPONSOR ALLIANCE MEMBER

CEVA  
CEVA  
ALLIANCE MEMBER EXHIBITOR

ChipsMedia  
Chips&Media, Inc.  
ALLIANCE MEMBER EXHIBITOR

Codeplay

Search  
GO

All terms must match

Type

Live Chat

Description

Name

Markets Served

Products or Services Provided

Software and Algorithms

ICs and SoCs Development Tools

Cameras Silicon IP

Design and Manufacturing Services

Processor Boards & Modules

Image and Video Data

Camera Modules Sensors

Standards Market Research

Strategic Consultancy

Mergers and Acquisitions Advisory

Lenses Open Source

Illumination Memory

< Search by **Keyword**

< Filter by **Name**

< Filter by **Tags**

# Connect with Exhibitors

Talk in real-time with exhibitors during **staffed exhibit booth hours!**

**BDTi** **BDTi** **LIVE NOW** **WANT TO MEET** **REQUEST INFO**

**GOLD SPONSOR** **ALLIANCE MEMBER** **ENTER LIVE CHAT**

**< Click the Enter Live Chat button within a booth to speak with exhibitors.**

BDTi is a specialized pro and deep learning. We focus on helping companies create and use technology through:

- Processor evaluation and selection
- Algorithm selection and design
- Software optimization

Chat with us live here in our booth:

- Tuesday, September 15, 10:30 am - 1:00 pm Pacific
- Wednesday, September 16, 9:00 am - 11:00 am, CST (for Asian attendees)

**Discussion** **NEW CONVERSATION**

**Jeremy Giddings** 11 hours ago

# 2020 Vision Product of the Year

2020  
embedded  
**VISION**  
summit

**Best  
AI Processor**



**Best  
Developer Tool**



**Best Automotive  
Solution**



**CONGRATULATIONS 2020 WINNERS!**

**Best AI Software  
or Algorithm**



Semantic Filtering

**Best Camera  
or Sensor**



Dynamic Vision Platform





# 2020 Workshops and Seminar

**Wednesday, Sept 16** | 9:00 am – 12:00 pm PT and **Friday, Sept 18** | 9:00 am – 12:00 pm PT

## Beyond 2020—Vision SoCs for the Edge

PRESENTED BY

**SYNOPSYS®**

**Friday, Sept 18** | 9:00 am – 1:30 pm PT

## Using the Intel Distribution of the OpenVINO Toolkit for Deploying Accelerated Deep Learning Applications

PRESENTED BY **intel.**

**Monday, Sept 21** | 9:00 am – 1:30 pm PT

## Edge AI for Retail

PRESENTED BY **intel.**

**Wednesday, Sept 23** | 9:00 am - 1:30 pm PT

## Edge AI for Industrial

PRESENTED BY **intel.**

See the **Agenda page** and click **Register Now** to add these sessions for \$25 each.

# Week Two Schedule-at-a-Glance

Monday  
**September 21**

9:00 am-1:30 pm PT  
WORKSHOP  
**Edge AI for Retail**

PRESENTED BY  
INTEL

Tuesday  
**September 22**

9:00-10:30 am PT  
**Daily Remarks, Presentations  
and Q&As**

10:30 am-1:00 pm PT  
**Product Presentations  
and  
Q&A Sessions**

1:00-2:00 pm PT  
**Presentations and Q&As**

Wednesday  
**September 23**

9:00 am-1:30 pm PT  
WORKSHOP  
**Edge AI for Industrial**

PRESENTED BY  
INTEL

Thursday  
**September 24**

9:00-10:30 am PT  
**Closing Remarks, Presentations  
and Q&As**

10:30 am-1:00 pm PT  
**Product Presentations  
and  
Q&A Sessions**

1:00-2:00 pm PT  
**Presentations and Q&As**

**Don't miss the exhibit booths!**

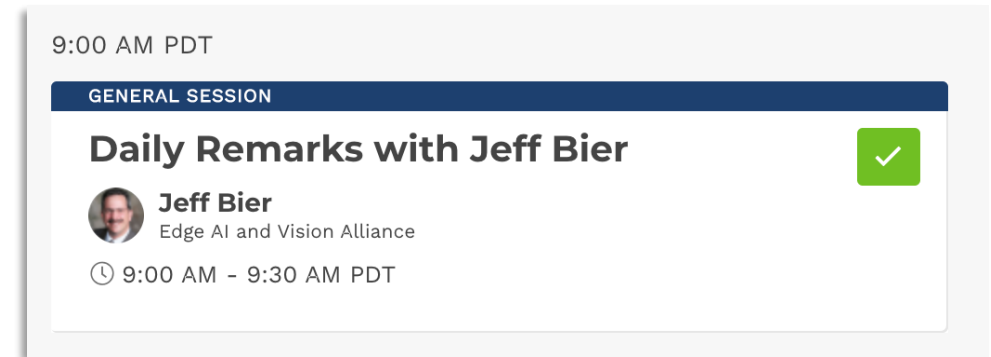
Download exhibitor product info, request a meeting, or click the  
**Request Info** button to get your questions answered by exhibitors.

# Daily Remarks with Jeff Bier

On **September 22** (Tues.) and **September 24** (Thurs.) at 9:00 am PT, I will:

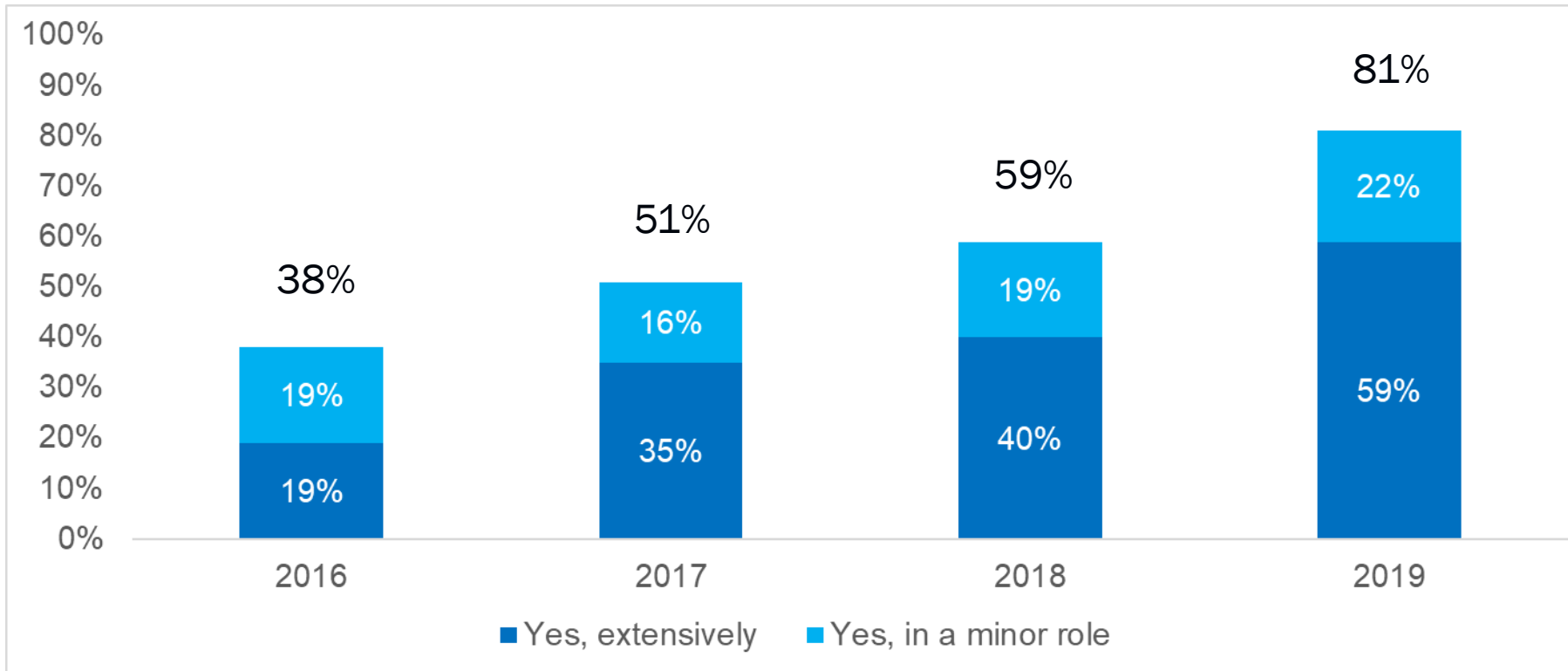
- Recap Summit highlights from the past day or two
- Preview what's coming up next
- Share data and insights, including:
  - Results from the Edge AI and Vision Alliance's *Computer Vision Developer Survey*
  - Observations on key technology and industry challenges
  - "Lighthouse" applications
  - Market research highlights

Join me!

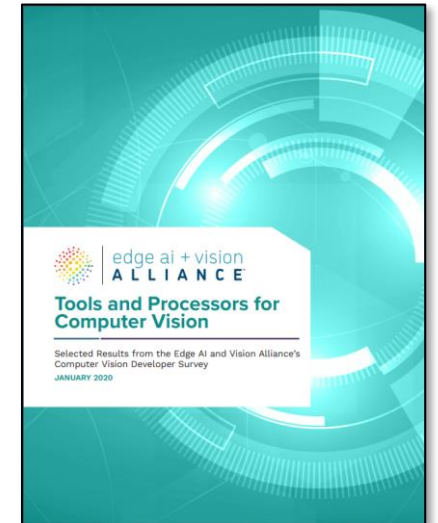




# Use of Neural Networks in Vision Applications

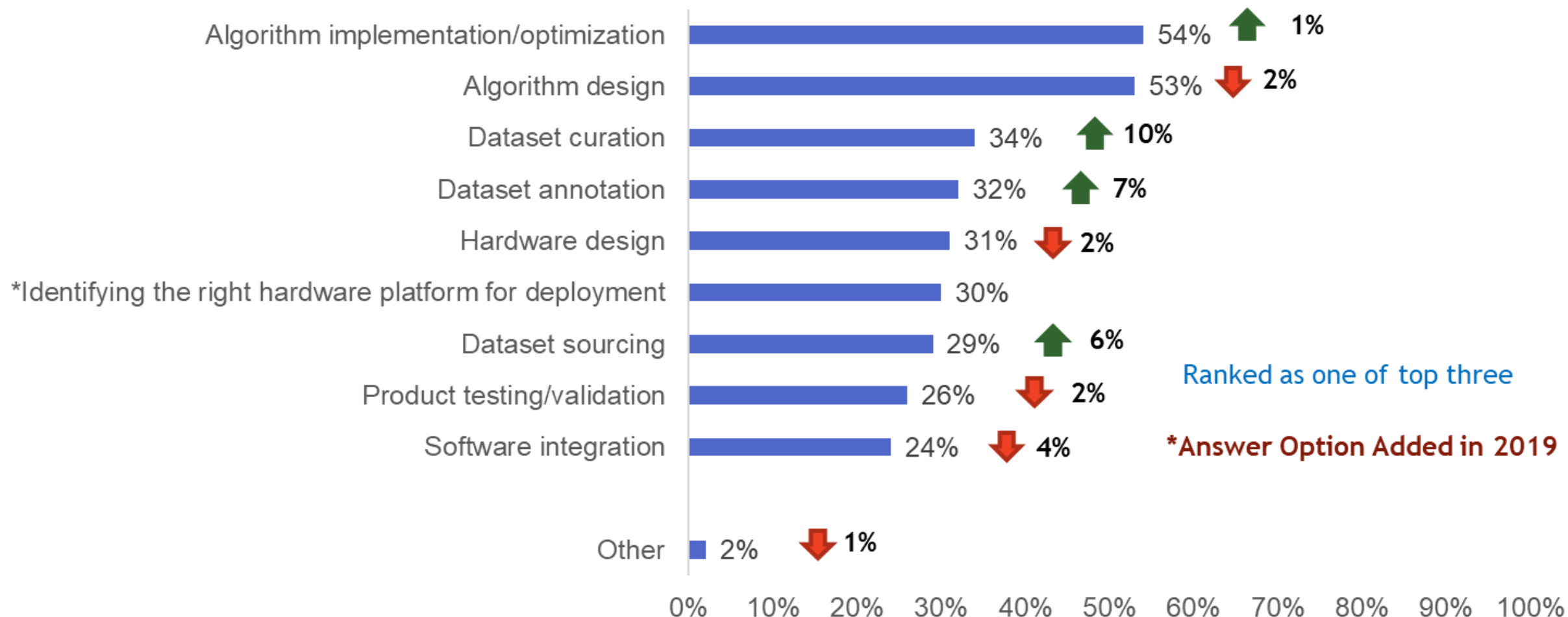


Source: Edge AI and Vision Alliance, *Computer Vision Developer Survey*, Oct. 2019

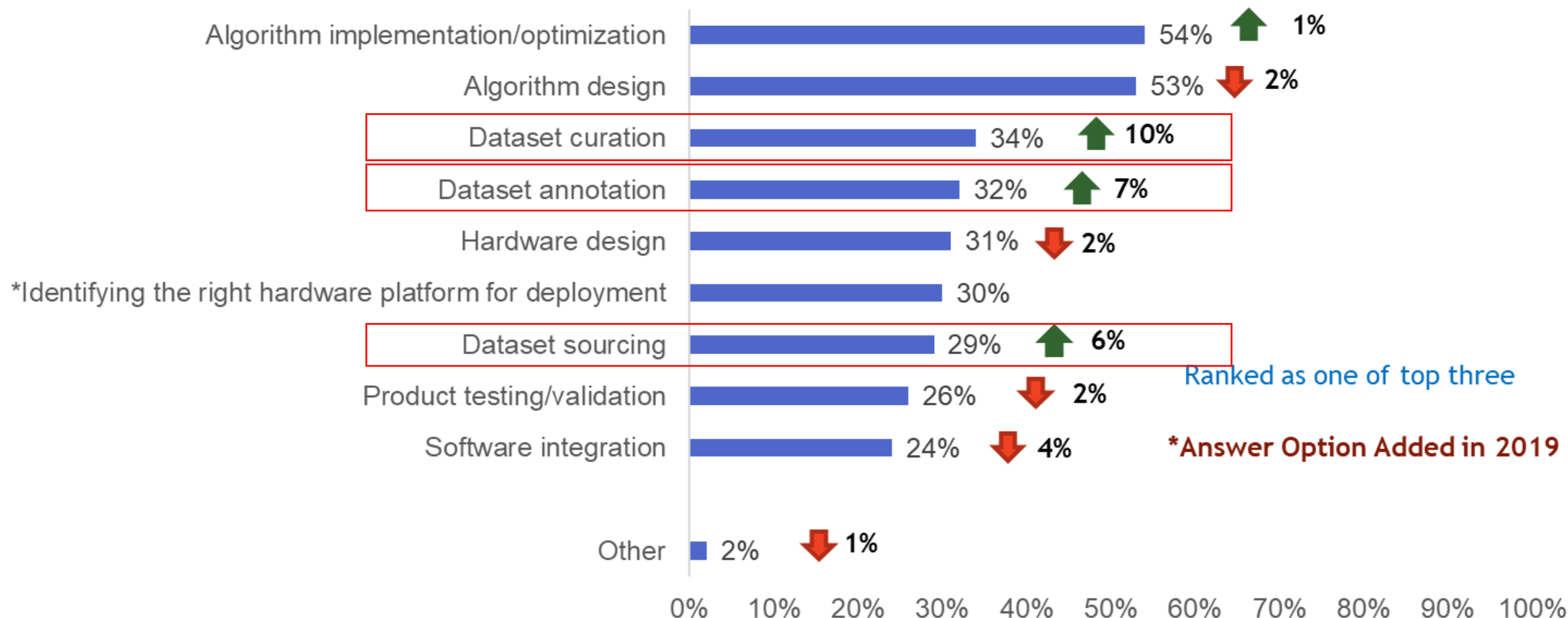


[bit.ly/  
DeveloperSurvey  
WhitePaper2020](https://bit.ly/DeveloperSurveyWhitePaper2020)

# Most Challenging Areas of Computer Vision Product Development



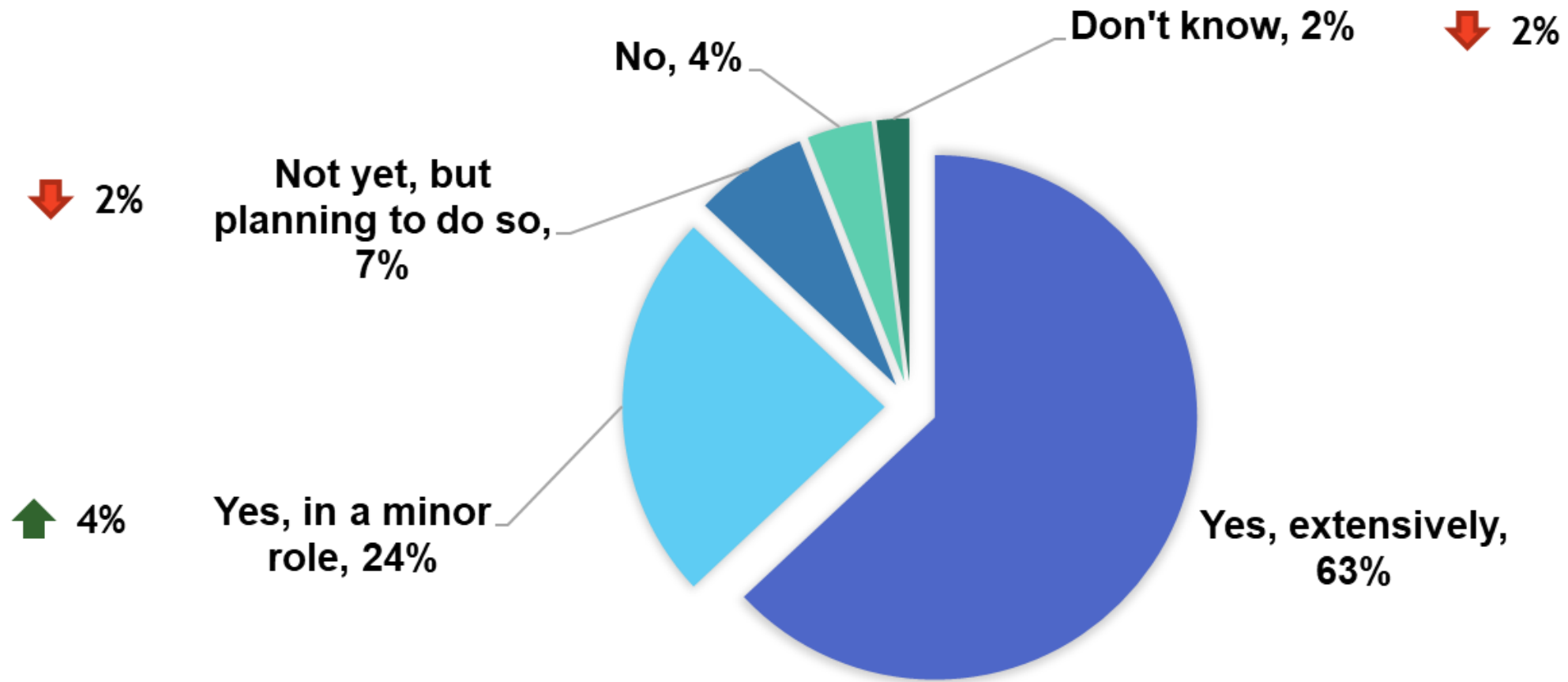
# Most Challenging Areas of Computer Vision Product Development



Source: Edge AI and Vision Alliance, *Computer Vision Developer Survey*, Nov. 2019



# Using Non-Neural Network Algorithms to Perform Computer Vision Functions



Thursday, Sept. 24,  
9:30 am PT

2020  
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**VISION**  
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VIRTUAL | SEPT 15-25

## BUSINESS INSIGHTS

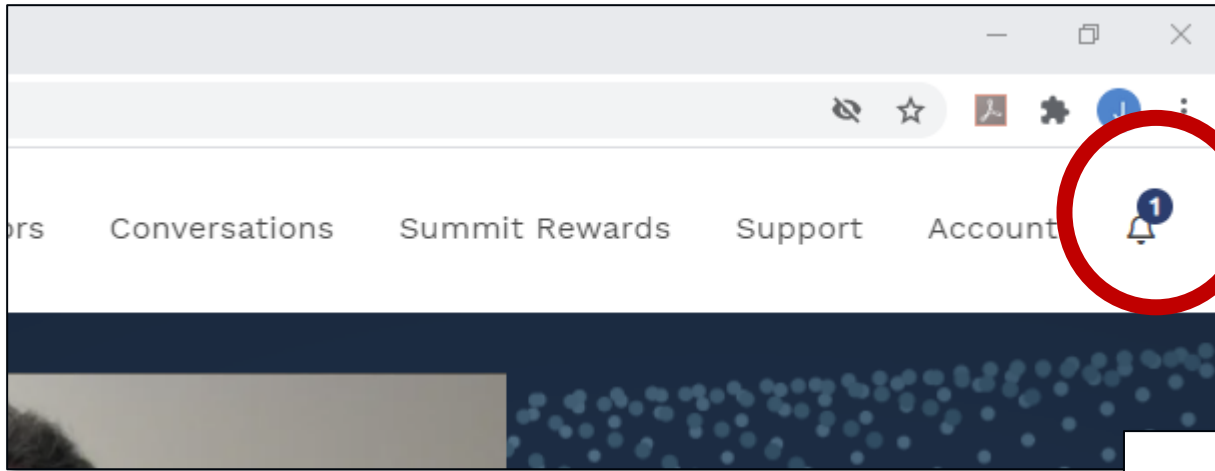
# Key Trends and Challenges in Practical Visual AI and Computer Vision

**Jeff Bier**

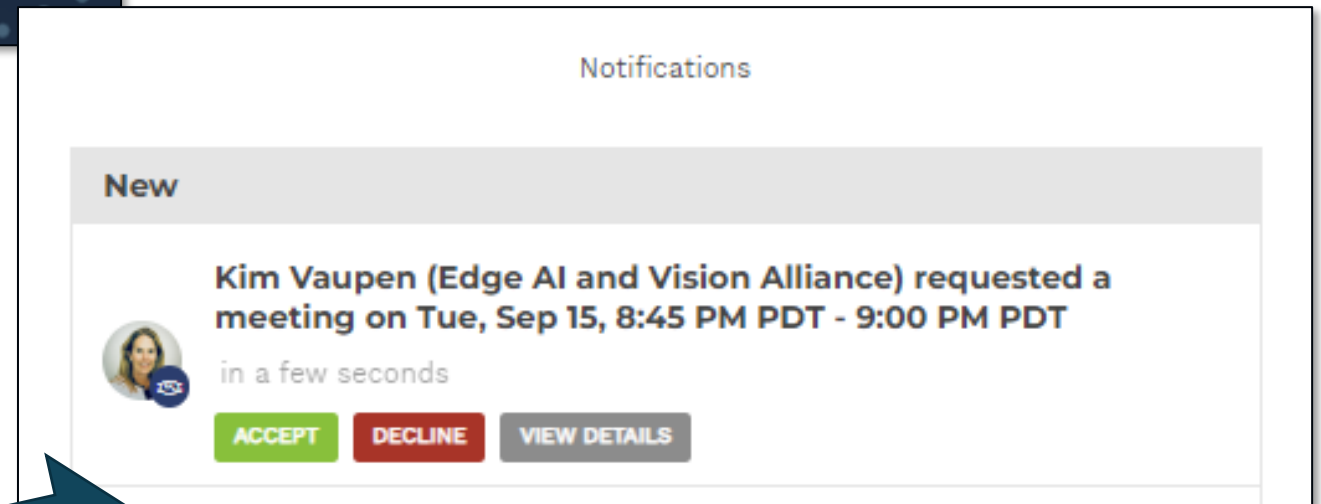
Founder, Edge AI and Vision Alliance  
President, BDTI



# Check for Meeting Invitations and Messages



Number on bell icon  
means new invitations,  
messages or notifications





# Thanks to Our Sponsors!

## PREMIER



## GOLD



## SILVER



## SPECIAL EVENT



# Solving Real-World Problems at Scale



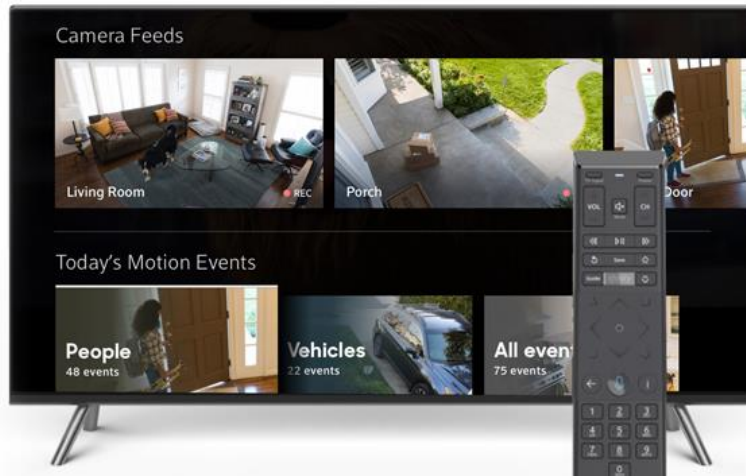
Source: TechCrunch



Source: zipitwireless.com



Source: iphoness.com



Source: xfinity.com



Source: deere.com



Source: Skydio



# Edge AI and Vision Alliance Members

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# Connect with Summit Attendees

The screenshot shows the 'WANT TO MEET LIST' interface for the 2020 Embedded Vision Summit. The top navigation bar includes links for Home, Schedule, People, Sponsors, Exhibitors, Conversations, Summit Rewards, Upgrade, Support, and Account. A search bar is located on the right side of the header. Below the navigation bar, the main content area displays a grid of attendee profiles. Each profile includes a circular profile picture, a name, and a job title. To the right of the grid, there is a search and filter sidebar. The sidebar has a search bar with a 'GO' button and a toggle for 'terms must match'. Below the search bar, there are several filter categories: First name, Last name, Title, Company, Ribbons, and Markets Served. The 'Products or Services Sought' section is expanded, showing various tags such as Camera Modules, Cameras, Design and Manufacturing Services, Development Tools, ICs and SoCs, Illumination, Image and Video Data (e.g. for Training), Lenses, Market Research, Memory, N/A, Open Source Software, Processor Boards & Modules, Sensors, Silicon IP, Software & Algorithms, Standards, and Venture Capital & Investment Banking. At the bottom of the sidebar, there are 'RESET' and 'HIDE >' buttons.

< Search by **Keyword**

< Filter by **Company**

< Filter by **Tags**

Build your  
**Want to Meet List,**  
**Propose a Meeting, or**  
**Send a Message!**

Three buttons are displayed vertically. The top button is dark blue with a white icon of two people and the text 'WANT TO MEET'. The middle button is grey with the text 'SCHEDULE MEETING'. The bottom button is white with a black border and the text 'SEND MESSAGE'.