

The logo for the 2024 Embedded Vision Summit is centered on the left side of the slide. It features a white octagonal background with a colorful, multi-layered border in shades of purple, blue, green, yellow, and orange. The text "2024" is at the top, "embedded" is below it, "VISION" is in large, bold, dark blue letters with a gradient, and "SUMMIT" is at the bottom in a smaller, dark blue font.

2024
embedded
VISION
SUMMIT®

A View from the Summit (Part 2)

Jeff Bier

Founder, Edge AI and Vision Alliance

President, BDTI

May 23, 2024

CV + AI + Retail

Inventory



Foot Traffic



Spills



Fraud



Queue lengths



Product Identification



365 Retail Markets © 2024



What I Learned Yesterday



Junko Yoshida
Editor-in-Chief
Ojo-Yoshida Report



Will Glaser
Founder and CEO
Grabango



BIZ & IT TECH SCIENCE POLICY CARS GAMING & CULTURE STO

AI STANDS FOR "ACTUALLY, INDIANS" —

Amazon Fresh kills “Just Walk Out” shopping tech—it never really worked

"AI" checkout was actually powered by 1,000 human video reviewers in India.

What I Learned Yesterday



David Scott, Instacart



The Spoon Tech

Opportunities: Consumer



Wyze

Make the Impossible Combination Possible!

embedded
VISION
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15,000-Year Monthly Video Duration

\$2.99 Monthly Subscription

1.5 ms Inference Latency

- Highly optimized cloud models
- Highly optimized on edge models
- Edge-cloud collaboration

WYZE Wyze Cam v3 From \$25.98

© 2024 Wyze Labs, Inc.

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Lin Chen, Wyze

Opportunities: Consumer




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- Highly optimized cloud models
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- Edge-cloud collaboration

WYZE Wyze Cam v3 From \$25.98 © 2024 Wozon Labs, Inc. 21

Lin Chen, Wyze

ER 11, 2023 - 7:00PM EST Jean-Marcel Arena Hawks

#77 - M. Wasserman

Game top speed: 6.5mph


#77 M. WASSERMAN

- RUSH 0:43 1st period | D vs H | 2023-11-11
- SHOT 1:04 1st period | D vs H | 2023-11-11
- GOAL 1:05 1st period | D vs H | 2023-11-11
- SHOT 1:04 1st period | D vs H | 2023-11-11
- GOAL 1:05 1st period | D vs H | 2023-11-11
- SHOT 1:04 1st period | D vs H | 2023-11-11
- RUSH 1:05 1st period | D vs H | 2023-11-11

Mehran Javan, Sportlogiq

Our Vision

- Given visual sensory inputs, can an AI app predict in real time how a sighted human would react in future?
- And then convey this prediction audibly to assist a blind individual



AI Guide Dog

Aishwarya Jadhav, CMU/Tesla

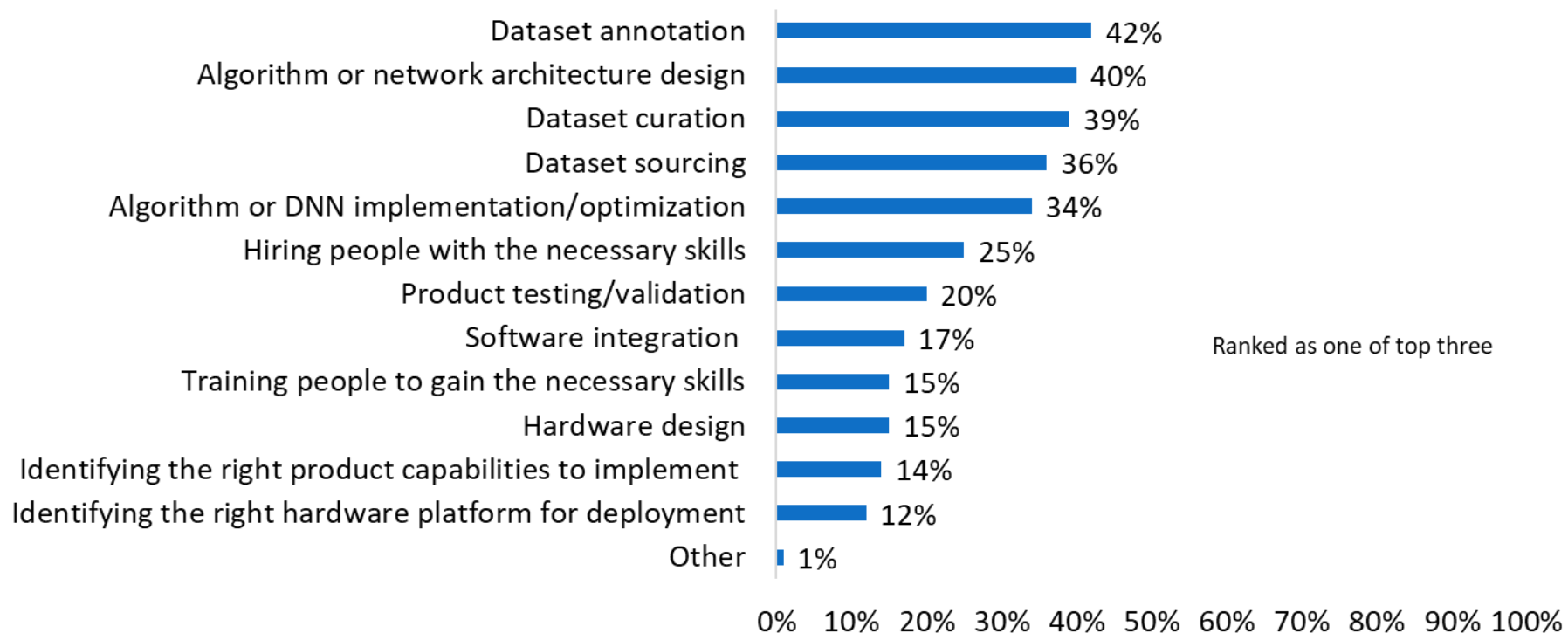
Ray Ban Meta Smart Glasses



Cultinno

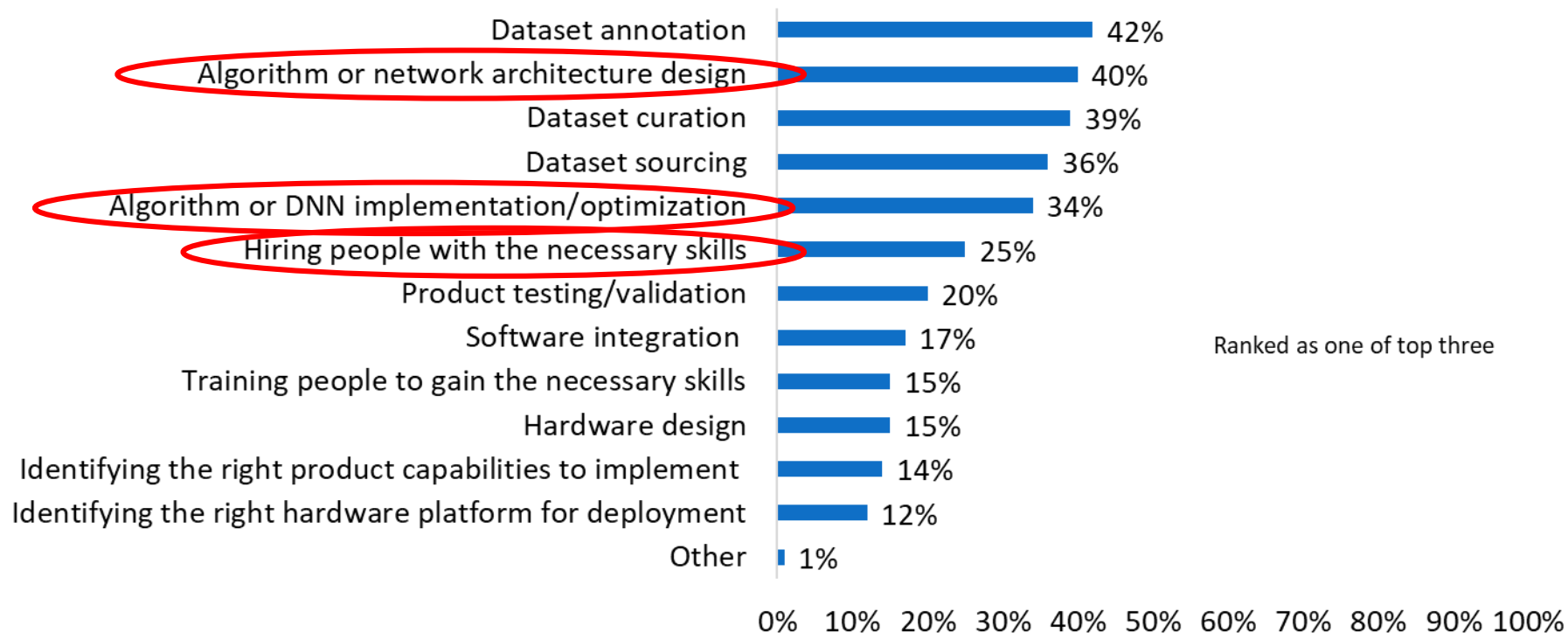
www.youtube.com/watch?v=NOdjgw_v4bw

Areas of Computer Vision/Machine Perception Product Development Most Challenging



Source: Edge AI and Vision Alliance, *Computer Vision and Perceptual AI Developer Survey, November 2023*

Areas of Computer Vision/Machine Perception Product Development Most Challenging



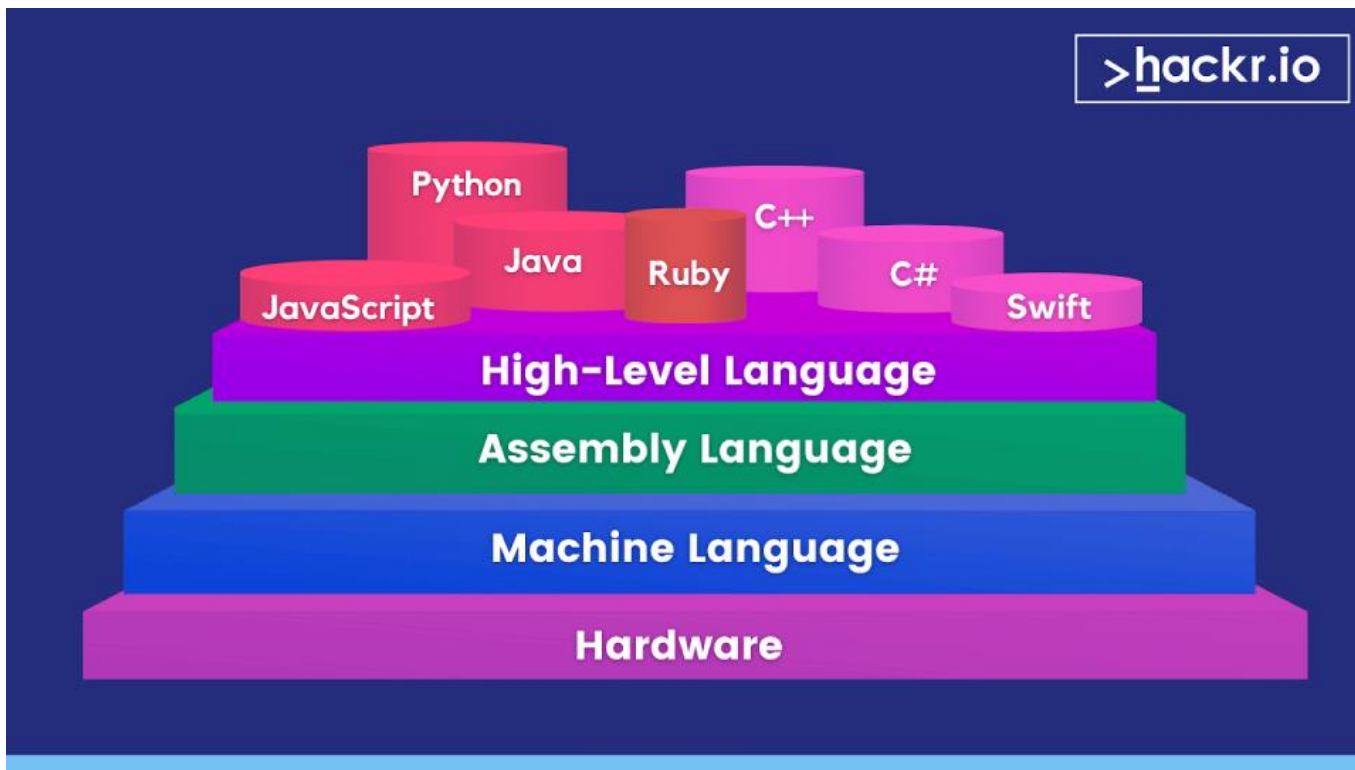
Source: Edge AI and Vision Alliance, *Computer Vision and Perceptual AI Developer Survey, November 2023*



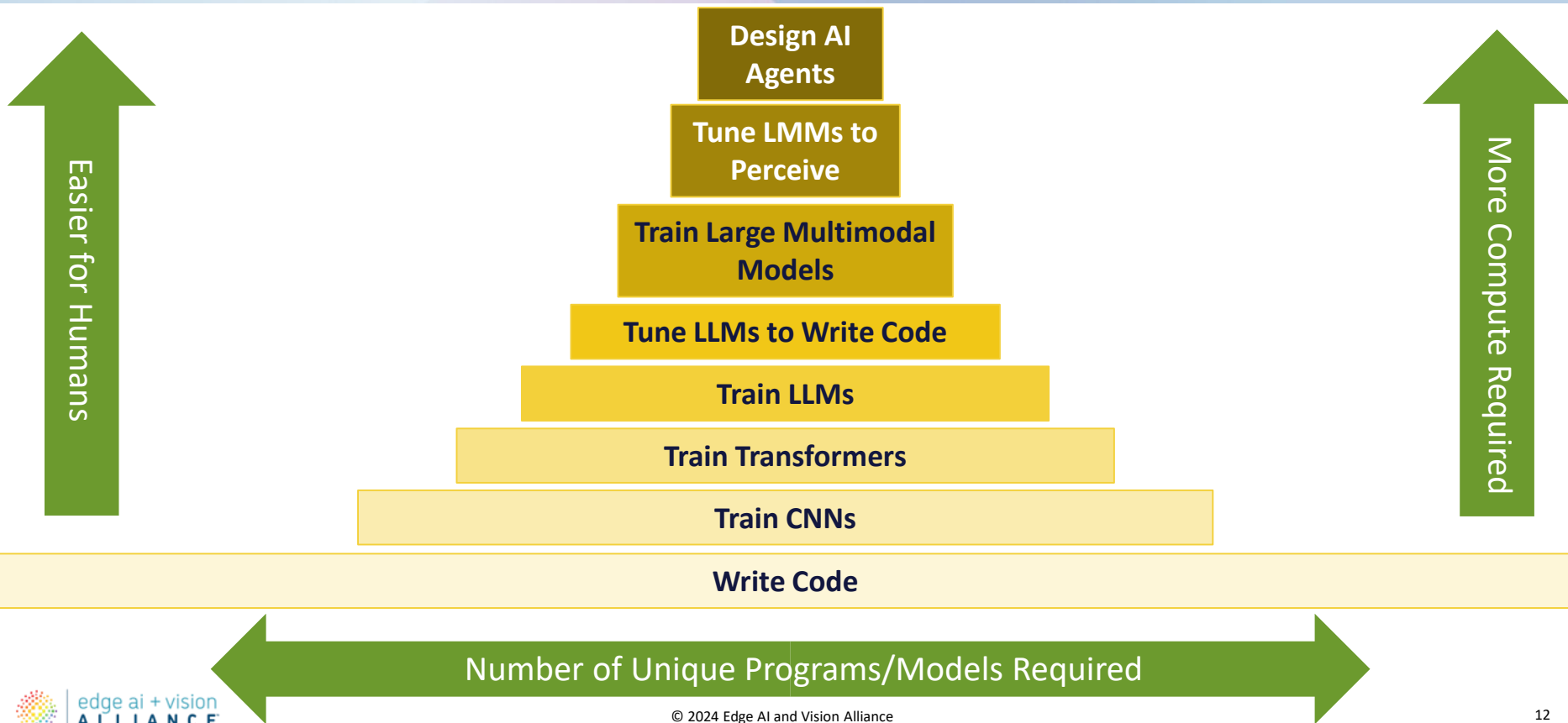
@sumo43

x.com/sumo43/status/1791589684121903555

How We Tell Computers What to Do



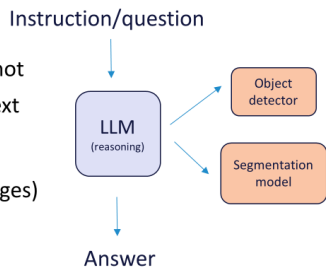
How We Tell Computers What to Do



What I Learned Yesterday

LLM-aided visual reasoning

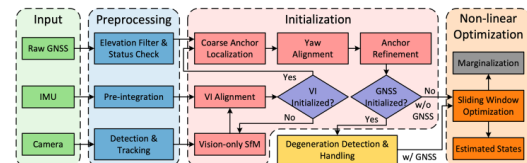
- LLM function calling
 - Controller – task planning
 - Decision maker – summarize, continue or not
 - Semantic refiner – generate text wrt. context
- Strong generalization
- Emergent ability (e.g., understand meme images)
- Better control



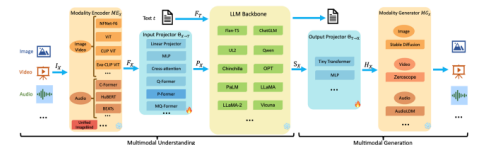
Istvan Fehervari, BenchSci

Thou Shalt Embrace Multimodality – Sensor Fusion is Good

Classical Kalman Filter / Nonlinear Optimization



Multimodal Large Language Models



Vaibhav Ghadiok, Hayden AI

Multimodal LLMs at the Edge: Are We There Yet?



Sally Ward-Foxton
EE Times



Adel Ahmadyan
*Meta Reality
Labs*



Jilei Hou
*Qualcomm
Technologies*



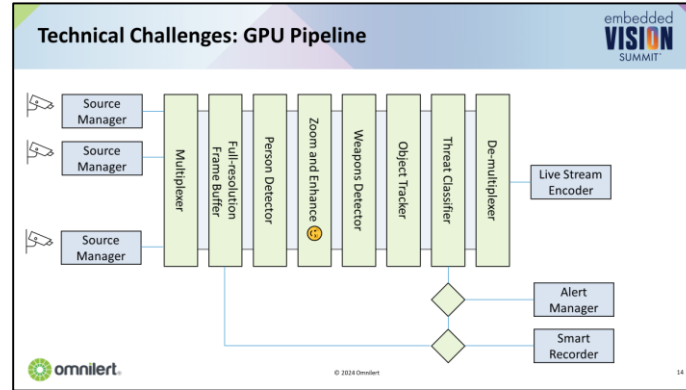
Yong Jae Lee
*University of
Wisconsin-Madison
and GivernyAI*



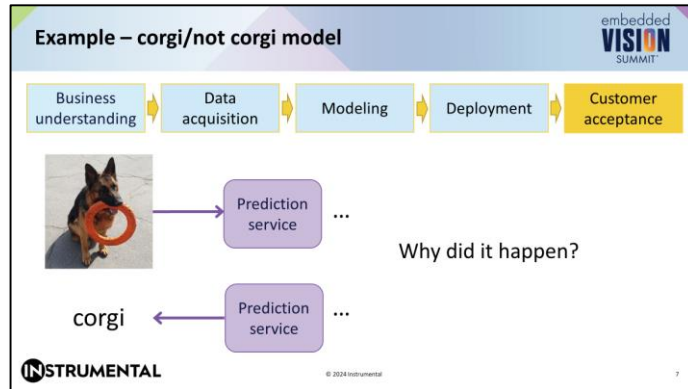
Pete Warden
Useful Sensors

Today 10:20 am

2024
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Chad Green, Omnilert



Rustem Feyzkhanov, Instrumental

Team Organization for Complex System Development

- Small teams.
- Multi disciplinary.
- Focused leads.
- Clear short terms objectives.
- Well defined overarching goals.

DEKA © 2024 DEKA Research and Development 11

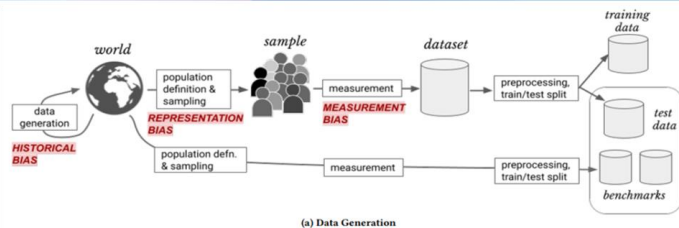
Dirk van der Merwe,
DEKA Research and Development

Bias in Data Generation



Historical Bias:

- Caused by preconceived notion even on perfectly measured/sampled data
- E.g., Gendered occupation
- Case study: Amazon hiring algorithm/ Google Gemini AI image generation



(a) Data Generation

Representation Bias:

- Target population does not:
 - reflect the user population
 - include underrepresented groups
- Sampling method is limited or uneven
- Two-fold representation – uniform vs proportional
- E.g., ImageNet images

Measurement Bias:

- The proxy oversimplifies a complex construct, or measurement methods and accuracy differ among groups
- E.g., COMPAS (Correctional Offender Management Profiling for Alternative Sanctions)

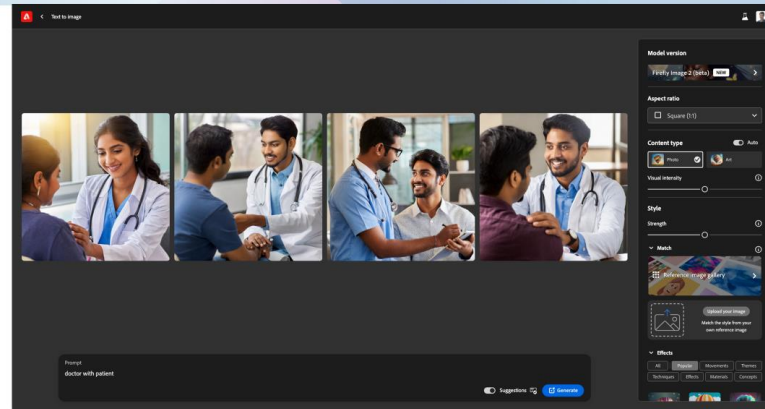
Nikita Tiwari, Intel



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Example of Debiasing Strategies for India



Rebecca Li, Adobe

Meanwhile, Back in the Lab...

“ The SDK install process was disjointed. It listed installation steps in an illogical order, some commands didn't do what they said they would do, others resulted in errors.

The Installation guide dead-ends and doesn't provide links to code examples to start learning their API. It's difficult to find 'get started' examples.

There's no Python support.

The field application engineers weren't intimately familiar with the reference code, and struggled to find documentation to point us in the right direction. ”

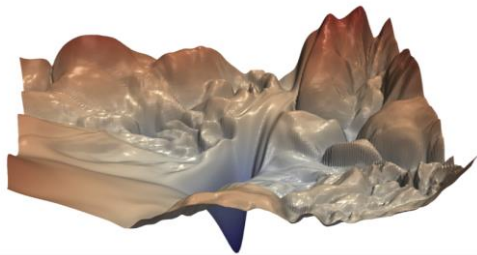


ChatGPT

For Product Developers



Navigating the Future: How Avnet is Addressing Challenges in AMR Design



Quantization of Convolutional Neural Networks: Quantization Analysis



Edge AI and Vision Alliance
Conversation with GenAI Nerds on
Generative AI At the Edge

www.edge-ai-vision.com

edge ai + vision
INSIGHTS
The latest developments in computer vision and edge AI

VOL. 13, NO. 19 A NEWSLETTER FROM THE EDGE AI AND VISION ALLIANCE Late September

To view this newsletter online, [please click here](#)

MULTIMODAL PERCEPTION

Frontiers in Perceptual AI: First-person Video and Multimodal Perception
First-person or "egocentric" perception requires understanding the video and multimodal data that streams from wearable cameras and other sensors. The egocentric view offers a special window into the camera wearer's attention, goals, and interactions with people and objects in the environment, making it an exciting avenue for both augmented reality and robot learning. The multimodal nature is particularly compelling, with opportunities to

KEYNOTE SPEAKER
Frontiers in Perceptual AI
First-Person Video and
Multimodal Perception
KRISTEN GRAUMAN
University of Texas at Austin

embedded
VISION
SUMMIT
OCT 11-13, 2024
SAN JOSE, CALIFORNIA

The premier conference for innovators adding computing edge



July 11, 9:00 am PST

“The Rise of Neuromorphic Sensing and Computing: Technology Innovations, Ecosystem Evolutions and Market Trends”



July 24, 9:00 am PST

“Who is Winning the Battle for ADAS and Autonomous Vehicle Processing, and How Large is the Prize?”

Register at:

www.edge-ai-vision.com/resources/webinars/



Save the Date!
May 20-22, 2025

Making the Most of Your Day

Thursday Schedule

9:00 am -
11:10 am

INTRODUCTION, AWARDS PRESENTATION, GENERAL SESSION and PANEL

11:10 am - 11:25 am **Break**

11:25 am -
12:30 pm

**Technical
Insights 1**

**Technical
Insights 2**

Fundamentals

**Business
Insights**

**Enabling
Technologies 1**

**Enabling
Technologies 2**

11:00 am -
5:00 pm
**Technology
Exhibits**
Exhibit Hall

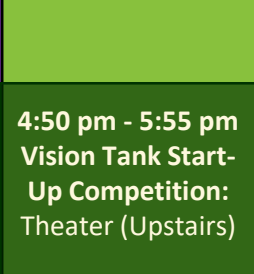
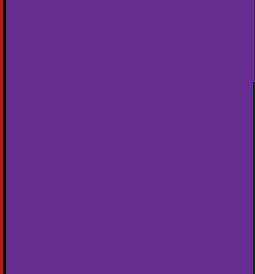
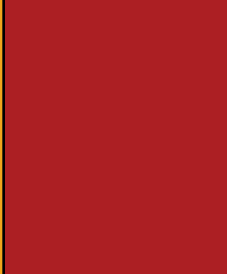
12:30 pm - 1:30 pm **Lunch - Exhibit Hall**

1:30 pm -
3:10 pm



3:10 pm - 4:15 pm **Break**

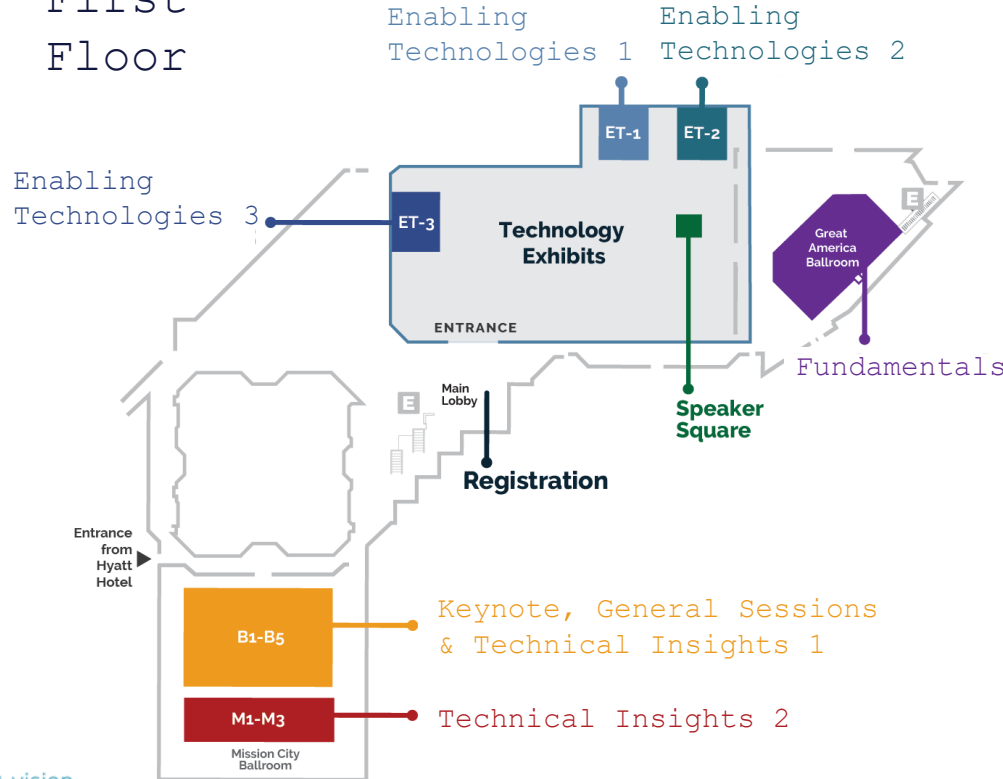
4:15 pm -
5:55 pm



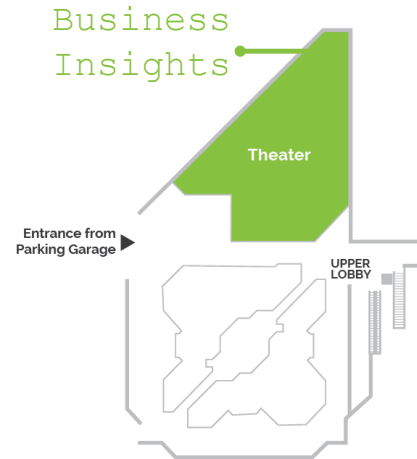
**4:50 pm - 5:55 pm
Vision Tank Start-
Up Competition:
Theater (Upstairs)**

Facility Map

First Floor



Second Floor



Facility Map

Technology

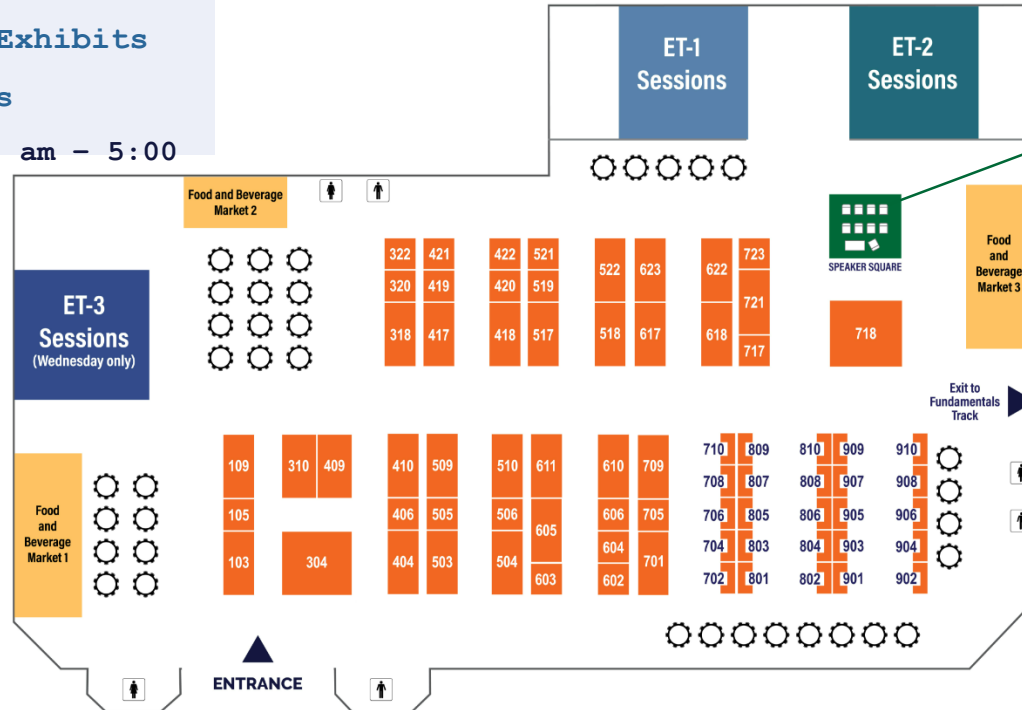
Exhibits

Technology Exhibits

Hours

Thursday 11:00 am - 5:00 pm

pm



Speaker Square

Thursday Speaker Office Hours (in the Speaker Square)



11:15 am – 12:00 pm Sally Ward-Foxton (*EE Times*)
AI processors and industry trends



11:15 am – 12:00 pm Yong Jae Lee
(University of Wisconsin-Madison and GivernyAI)
Vision language models, research directions



11:15 am – 12:00 pm Adel Ahmadyan (Meta)
Training and efficient implementation of large models at the edge



11:15 am – 12:00 pm Pete Warden (Useful Sensors)
LLMs at the edge



11:15 am – 12:00 pm Jilei Hou (Qualcomm Technologies)
Efficient implementation of large models at the edge

Thursday Speaker Office Hours (in the Speaker Square)



1:30 pm – 2:15 pm Himanshu Vajaria (365 Retail Markets) Retail applications; getting from model to product



1:30 pm – 2:15 pm Mehrsan Javan (Sportlogiq) Sports applications; creating a vision-based product



2:30 pm – 3:15 pm Jonathan Goldberg (D2D Advisory) Industry, technology and investment trends



2:30 pm – 3:15 pm Haran Thanigasalam (MIPI Alliance) MIPI camera interface standards

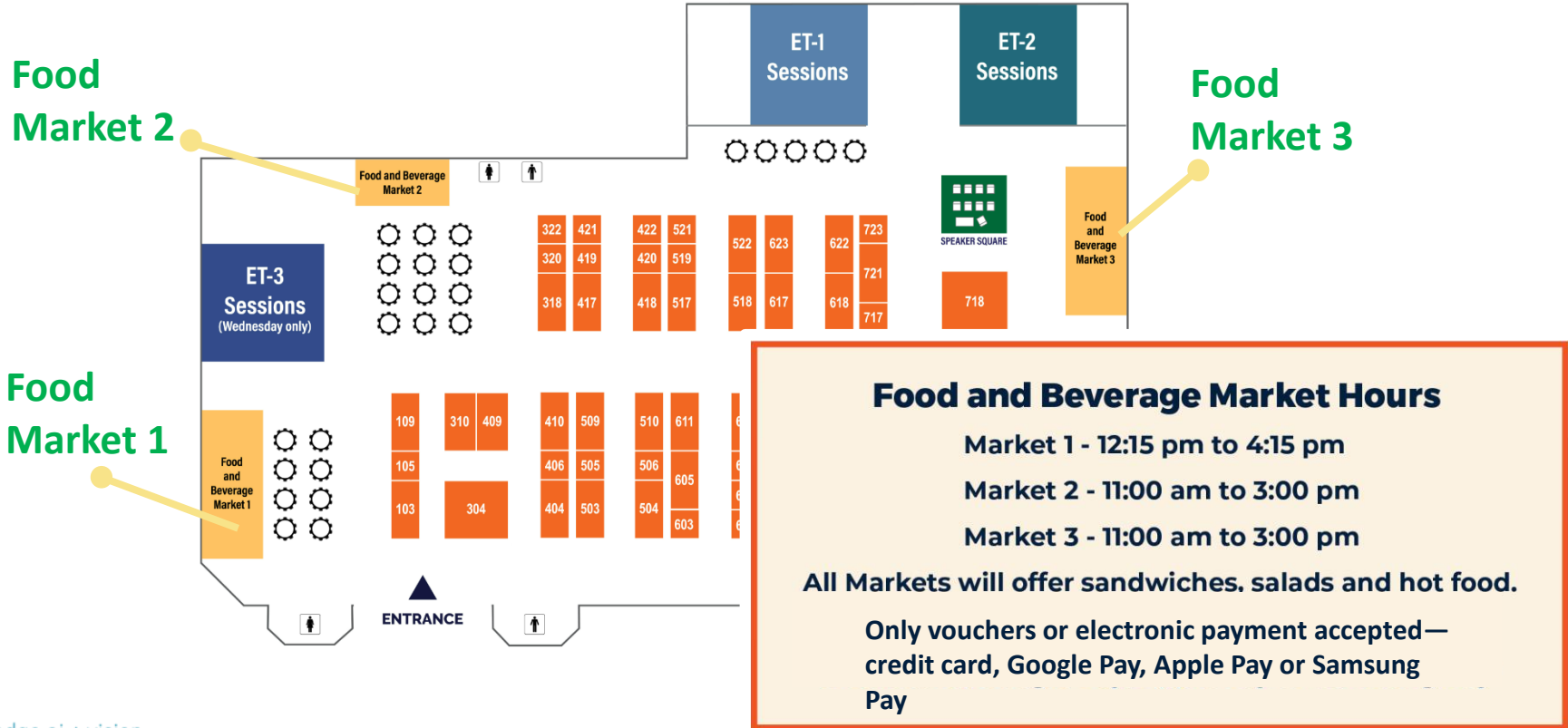


3:30 pm – 4:15 pm Lin Chen (Wyze) Consumer applications; creating a vision-based product



3:30 pm – 4:15 pm Chris Padwick (Blue River Technology) Agriculture applications; creating a vision-based product

Enjoy Food and Refreshments Visit the Food Markets in the Exhibit Hall



Download the Summit App



1. Scan the QR code and install the Attendee Mobile app
2. Allow Attendee Mobile to send you notifications
3. Then search for “Vision”

QR code not working?
Visit bit.ly/24sumapp

Questions? Stop by Registration for help!

Check Out the Exhibits!

 7sensing™	 ADTechnology	 ADVANTECH	 Advex	 AIM FUTURE	 ALIF SEMICONDUCTOR	 ANAFLASH	 ANALOG DEVICES AHEAD OF WHAT'S POSSIBLE™	 ANDES TECHNOLOGY	 arm	 avassa
 AVNET™	 AXELERA ARTIFICIAL INTELLIGENCE	 BDTi	 brainchip	 cadence®	 CEVA®	 Chelsio Communications Accelerate	 Chips Media™	 CLIKA.	 Commonlands Optics for Cameras	 CLONEABLE
 Connect Tech	 D3	 DEEPIX™ AI for Everyone & Everywhere™	 edge ai + vision ALLIANCE™	 edgehog	 EFINIX®	 embed EMBEDDED VISION SUMMIT	 ENERZAI	 EXOSTIV LABS	 expedera	 EyePop.ai
 fidus innovate • design • deliver	 flexlogix reconfigurable	 GenAI Nerds	 Gigamon TECHNOLOGIES	 HAILO	 intel REALSENSE	 INUITIVE	 SQUARED TECHNOLOGIES INC.	 KALRAY THE POWER OF MORE	 LANTRONIX®	 LATTICE SEMICONDUCTOR
 LEOPARD IMAGING	 LUMOTIVE	 MEDIATEK	 MICROCHIP	 Micron™	 modelbit	 n Network Optix	 nextchip	 Nota AI	 NXP	 ONIT
 OpenCV	 openMV	 Quadric	 Qualcomm	 SILICON scapes enabling the gap between hardware and software	 SiMa.ai	 ST STMicroelectronics	 Sunex Excellence in Digital Imaging Optics	 SYNOPSYS®	 TechNexion	 TENYKS
 UNTETHER AI	 USEFUL SENSORS	 VeriSilicon	 Videology Industrial Grade Cameras in silicon	 VISIONARY.AI	 waveye	 YUAN	embeddedvisionsummit.com/sponsor-exhibitor-directory			



Please fill out your Embedded Vision Summit survey!

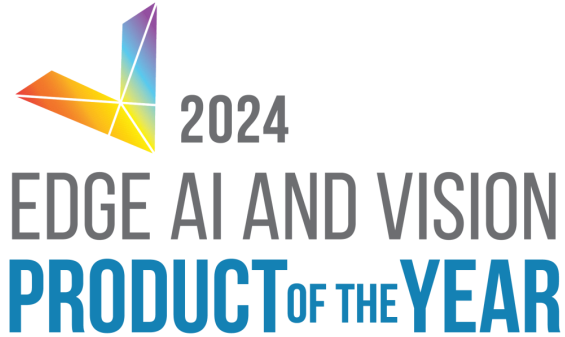
Completed surveys will be entered into a drawing for one of three
\$100 Amazon gift cards.





Thank You!

Recognizing Innovation



Building block technologies



End products

Thank You to Our Judging Panel!



Shung Chieh
SVP Eikon Systems
Eikon Therapeutics



Torsten Fink
VP, Media Processing and Delivery
DOLBY Labs, Inc.



Nathan Knopp
Principal Software Architect
Chamberlain Group



Toly Kotlarsky
Distinguished MTS, R&D
Zebra Technologies Corp.



Pavan Kumar
Senior Product Manager
Google Labs



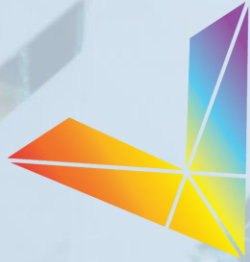
Jason Lavene
Sr Principal Architect
Keurig Dr Pepper



Brett Serene
Sr SW Engineering Manager
Cutera, Inc.



Tom Vogelsong, Ph.D.
Life Science and Tech Advisor
K2X Capital



2024

EDGE AI AND VISION
PRODUCT OF THE YEAR

WINNER

**BEST EDGE AI
PROCESSOR**



2024

**EDGE AI AND VISION
PRODUCT OF THE YEAR**



edge ai + vision
ALLIANCE™

WINNER

**BEST EDGE AI
PROCESSOR**



2024

**EDGE AI AND VISION
PRODUCT OF THE YEAR**



edge ai + vision
ALLIANCE™

Qualcomm

**Snapdragon®
X Elite Platform**

WINNER

**BEST EDGE AI
SOFTWARE
OR ALGORITHM**



2024

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ALLIANCE™

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2024

**EDGE AI AND VISION
PRODUCT OF THE YEAR**



edge ai + vision
ALLIANCE



Ambarella

**Central 4D Imaging
Radar Architecture**

WINNER

**BEST EDGE AI
DEVELOPER TOOL**



2024

**EDGE AI AND VISION
PRODUCT OF THE YEAR**



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WINNER

**BEST EDGE AI
DEVELOPER TOOL**



2024

**EDGE AI AND VISION
PRODUCT OF THE YEAR**



edge ai + vision
ALLIANCE



TENYKS

**Data-Centric
CoPilot for Vision**

Congratulations!

WINNER BEST EDGE AI PROCESSOR

2024
EDGE AI AND VISION
PRODUCT OF THE YEAR



Qualcomm
Snapdragon®
X Elite Platform

edge ai + vision
ALLIANCE

WINNER BEST EDGE AI SOFTWARE OR ALGORITHM

2024
EDGE AI AND VISION
PRODUCT OF THE YEAR




Ambarella
Central 4D Imaging
Radar Architecture

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ALLIANCE

WINNER BEST EDGE AI DEVELOPER TOOL

2024
EDGE AI AND VISION
PRODUCT OF THE YEAR



TENYKS
Data-Centric
CoPilot for Vision

edge ai + vision
ALLIANCE



AI INNOVATION AWARDS 2024

2024 AI Innovation Award—Retail



Stockwell 2.0



Category: Retail



Enabling Smart Retail with Visual AI
Himanshu Vajaria, Engineering Manager
Thursday, May 23, 11:25 AM - 11:55 AM



2024 AI Innovation Award—Agriculture



Image: U.S. Government Accountability Office

See & Spray™ Premium



Better Farming through Embedded AI
Chris Padwick, Director of CV/ML, Blue River Technology
Thursday, May 23, 2:40 PM - 3:10 PM

2024 AI Innovation Award—Industrial



Image: Nsflow

Magic Leap 2



2024 AI Innovation Award—Security/Surveillance



Image: acoba

Omnilert Gun Detect



2024 AI Innovation Award—Robotics



Image: Technology Innovators Magazine

Platform 2 Drone



Zipline



AI INNOVATION AWARDS 2024

WINNERS

 **365 Retail Markets**
Stockwell 2.0



JOHN DEERE

See & Spray Premium

Magic Leap 
Magic Leap 2



omnilert[®]

Omnilert Gun Detect



Zipline

Platform 2 Drone

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edge ai + vision
ALLIANCE™

General Session:

What's Next in On-Device Generative AI



Jilei Hou

Vice President of Engineering and
Head of AI Research, Qualcomm Technologies

2024
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Multimodal LLMs at the Edge: Are We There Yet?



Sally Ward-Foxton
EE Times



Adel Ahmadyan
*Meta Reality
Labs*



Jilei Hou
*Qualcomm
Technologies*



Yong Jae Lee
*University of
Wisconsin-Madison
and GivernyAI*



Pete Warden
Useful Sensors

Text your questions to +1 408-400-2702

2024
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9:00 am -
11:10 am

INTRODUCTION, AWARDS PRESENTATION, GENERAL SESSION and PANEL

11:10 am - 11:25 am **Break**

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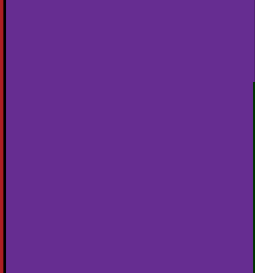
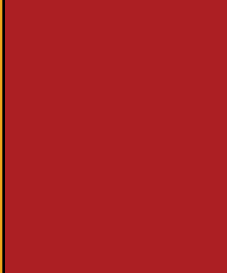
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3:10 pm



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4:15 pm -
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Up Competition:
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