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26th Annual Needham Growth Conference

LOTTE New York Palace

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John Young, VP Finance
Louis Gerhardy, VP Corporate Development
Forward-Looking Statements

This presentation contains forward-looking statements that are subject to many risks and uncertainties. All statements made in this presentation other than statements of historical facts are forward-looking statements, including, without limitation, statements regarding Ambarella’s strategy, future operations, financial targets, future revenues, projected costs, prospects, plans and objectives for future operations, future product introductions, future rate of our revenue growth, the size of markets addressed by the company’s solutions and the growth rate of those markets, technology trends, our ability to address market and customer demands and to timely develop new or enhanced solutions to meet those demands, our ability to achieve design wins, our ability to build and deliver products to customers, and our ability to retain and expand our customer and partner relationships.

In some cases, you can identify forward-looking statements by terms such as "may," "will," "should," "could," "would," "expects," "plans," "anticipates," "believes," "estimates," "projects," "predicts," "potential," or the negative of those terms, and similar expressions and comparable terminology intended to identify forward-looking statements. We have based forward-looking statements largely on our estimates of our financial results and our current expectations and projections about future events, markets and financial trends that we believe may affect our financial condition, results of operations, business strategy, short term and long-term business operations and objectives, and financial needs as of the date of this presentation. Although these forward-looking statements are based upon information available at the time the statements are made and reflect management’s good faith beliefs, forward-looking statements inherently involve known and unknown risks, uncertainties and other factors that may cause actual results, performance or achievements to differ materially from anticipated future results. Important factors that could cause actual results to differ materially from expectations are disclosed in Ambarella’s annual reports on Form 10-K and quarterly reports and Form 10-Q filed with the Securities and Exchange Commission (the “SEC”), particularly in the sections titled “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.” You should not place undue reliance on forward-looking statements, which speak only as of the date on which they are made. We do not undertake to update or revise any forward-looking statements after they are made, whether as a result of new information, future events, or otherwise, except as required by applicable law. Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed in this presentation may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

Before you invest, you should read the annual and quarterly reports and other documents Ambarella has filed with the SEC for more complete information about the company and its ordinary shares. Additional information will also be set forth in Ambarella’s future quarterly and annual reports and other filings made with the SEC from time to time. You may access these documents for free by visiting EDGAR on the SEC web site at www.sec.gov.
Global Footprint 918 vs. 951 a Year Ago
~82% of employees are engineers and ~69% of the engineers are focused on software/algorithms

- **United States**: 260
- **Europe**: 77
- **China**: 225
- **Taiwan**: 341
- **Hong Kong**: 5
- **Korea**: 5
- **Japan**: 5

**Manufacturing**
- Samsung Semiconductor

**US ODMs**
- Jabil
- Flextronics

**Oculii**
- Dayton, Ohio
  - Acquired 2021
  - Radar algorithms

**VisLab**
- Parma, Italy
  - Acquired 2015
  - AD software stack

**Currency**
- Founded and incorporated in Cayman Islands in 2004

**China ODMs**
- Goertek
- Huaqin
- Kenxen

**India ODM**
- VVDN

**Taiwan ODMs**
- Chicony
- Sercomm
- Vivotek
- LiteOn
- WNC
- Dynacolor
- Topview
Ambarella is an Edge Artificial Intelligence Company
Introducing advanced hardware and software technology

- Since our founding in 2004, we have been focused on digital video applications, always with the premise that video is a unique type of data requiring an optimized chip architecture.

  - **First 12 years.** Initially targeted human viewing applications with low-power and high-resolution video processing SoCs for the consumer and security camera markets.
  
  - **The last 6+ years.** Intensive R&D investment led to the development of a deep neural network AI inference processor initially targeting IoT endpoints. When combined with the existing video processor, the integrated computer vision (“CV”) system-on-a-chip (“SoC”) enables machines to perceive their environment and make intelligent decisions, facilitating higher levels of automation in multiple industries.
  
  - **We are expanding our processing beachhead** beyond video perception and into new markets with the introduction of CV3 and the acquisition of Vislab and Oculii.

![Graph showing AI revenue contribution begins and significant AI R&D investment](image)
a New Foundation for Growth
Successfully leveraging perception heritage into multiple high value deep learning AI applications

Human Viewing
Perception and Viewing

Fully Automated
Partially Automated

Video processor
ISP Encode

AI inference - Computer vision processor
ISP Encode CVflow

AI inference - Central Domain AI controller
ISP Encode CVflow

GenAI is expected to be important for both existing markets and new opportunities
Ambarella inference AI technology and products have been successfully established at the foundation of the “network hierarchy” where low power, highly efficient processing, low latency, and privacy/security are critical.

Source: Omdia/IHS, Ambarella

Q3 F2024 earnings call: “Some of our existing customers are evaluating how they will implement GenAI and LLMs at the edge of their network. With our successful LLM demo and additional analysis we have concluded the powerful and highly efficient AI inference processor embedded in our CV3 SoCs is well suited for these edge markets.”
Ambarella’s “Algorithm First” Approach

Our technology and products are differentiated by our approach, domain expertise and people

Superior Perception - leveraged into - Al-based Computer Vision & Radar Processing

We win due to our efficiency as measured by performance-per-Watt.

“Algorithm First” Approach
Programmable AI Platform with Optimized Acceleration

Image Processing & Compression

Image Processing and Compression Experience

Autonomous Driving

25 years of Autonomous Driving Experience

Radar Processing

Oculii Patented Adaptive AI Radar Algorithms

CVflow® - Deep Neural Network AI processor

CVflow® - Superior AI Performance Per Watt

17 years of Image Processing and Compression Experience

We win due to our efficiency as measured by performance-per-Watt.
# Scalable Deep Learning AI Inference Processor Portfolio

## Superior AI performance per Watt

### CV3 SoC Family To-Date

<table>
<thead>
<tr>
<th>CV3-AD635</th>
<th>CV3-AD655</th>
<th>CV3-AD685</th>
<th>N1</th>
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<tbody>
<tr>
<td>NEW</td>
<td>NEW</td>
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### Availability

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<tbody>
<tr>
<td>Production</td>
<td>February 2021</td>
<td>Production July 2019</td>
<td>Production December 2018</td>
<td>Production April 2021</td>
<td>Production August 2019</td>
<td>Production April 2021</td>
<td>Production 2022</td>
<td>Sampling</td>
<td>Samples Q1 2024</td>
<td>Samples Q1 2024</td>
<td>Sampling Dec 2023</td>
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</table>

### Mkt

<table>
<thead>
<tr>
<th>Mkt</th>
<th>IoT and Auto ADAS</th>
<th>Auto ADAS</th>
<th>IoT and Auto</th>
<th>Auto</th>
<th>IoT and Auto ADAS</th>
<th>Auto Mainstream</th>
<th>Auto L2++ (Advanced L2++)</th>
<th>Auto L3, L4, robotics</th>
<th>GenAI; Edge AI</th>
</tr>
</thead>
<tbody>
<tr>
<td>IoT and Auto ADAS</td>
<td>Up to 3 cameras</td>
<td>Up to 2 cameras</td>
<td>Up to 6 cameras and stereo support</td>
<td>Up to 3 cameras and stereo support</td>
<td>Up to 14 cameras</td>
<td>Up to 10 sensors</td>
<td>Up to 8 sensors</td>
<td>Up to 12 sensors</td>
<td>Up to 24 sensors</td>
</tr>
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</table>

### AI Inference

<table>
<thead>
<tr>
<th>AI Inference</th>
<th>Sensor</th>
<th>CVflow® Deep Neural Network AI Inference Processor (software tools port from TensorFlow, Caffe, ONNX, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>¼ of CV22 AI</td>
<td>½ of CV22 AI</td>
<td>Baseline (CVflow DNN AI) 4x CV22 AI 2x CV22 AI 3.5x CV22 AI ~4x CV22 AI ~13x CV22 AI ~27x CV22 AI ~80x CV22 AI ~160x CV22 AI</td>
</tr>
</tbody>
</table>

*The N1 Cooper Development platform announcement + availability is January 2024, however the N1 SoC (also known as CV3-AD High) was announced in January 2022 and sampled in June 2022*
Large and Growing Markets

Serviceable market ("SAM") revenue CAGR in the high teens

- F2023 revenue was ~26% Auto and ~74% IoT
- F2028 revenue SAM estimate ~70% Auto and ~30% IoT
- We are focused on IoT end point applications where a majority of the decision making originates from data collected from high bandwidth sensors (cameras and 4D imaging radar)
- We address the megatrends of security, safety, and automation
- Key driver is to enable electronic systems to perceive the world and make intelligent decisions; human viewing business expected to decline as a proportion of revenue
- CV has triggered new product cycles in existing IoT markets and opened entirely new opportunities in the auto and IoT markets
- SAM estimates do not include opportunities for autonomous driving software IP nor large language models ("LLMs")
Evidence of Success
Targeting AI Inference to be up to 60% of total F2024 revenue

• >325 unique AI customers*

• >230 unique AI customer products have reached production*

• AI SoC portfolio, software tools, and platforms are stable, mature and under continuous improvement

• ~17 million AI SoCs have shipped**

*cumulative, as of January 31, 2023
**cumulative, as of July 31, 2023

Al is becoming pervasive, we are embedding AI inference processors in all our new products and there is strong and growing evidence of market acceptance.
# Modeling the Automotive Opportunity

~26% of F2023 revenue from automotive (excludes AD SW stack IP and radar perception SW IP)

## Ambarella Automotive Opportunity

<table>
<thead>
<tr>
<th></th>
<th>Viewing and ADAS</th>
<th>Autonomous Driving</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambarella Automotive</strong></td>
<td><strong>Visualization</strong></td>
<td><strong>Forward-Facing</strong></td>
</tr>
<tr>
<td><strong>Opportunity</strong></td>
<td>(dataloggers, drive recorders, ADAS combinations)</td>
<td>ADAS (“Front ADAS”)</td>
</tr>
<tr>
<td><strong>C2022 AMBA SAM</strong>*</td>
<td>~$260M</td>
<td>~$1.7B</td>
</tr>
<tr>
<td><strong>C2027 AMBA SAM</strong>*</td>
<td>~$400M</td>
<td>~1.3B</td>
</tr>
</tbody>
</table>

**C2022 global penetration into new vehicle production**

- 10% - 15% (pre-install)
- 65% - 70%
- Emirror: 2% - 3%
- In Cabin: 5% - 10%
- Access/Personalization: ~1%
- ~2%
- <0.1%

**Ambarella F2023 Revenue**

- Existing market: Increasingly T1/OEM driven (versus aftermarket)
- Incremental market: Marketshare commenced F2022
- Incremental market: increasing activity
- Incremental market: High activity
- Incremental market: First award

**Products (Examples)**

- A12, H22
- CV25, CV5
- CV22FS, CV2FS, CV72, CV3
- A12, H22
- CV25, CV22FS, CV5
- CV2FS, CV72, CV3
- CV22FS, CV2FS, CV3

**Target Customers**

- Retail (aftermarket)
- Tier 1s (pre-install)
- Tier 1s
- Tier 1s
- Tier 1s
- OEMs / Tier 1s
- OEMs / Tier 1s

*SAM estimates exclude autonomous driving software stack IP and radar perception software IP

Source: TSR, Strategy Analytics, Ambarella
Auto: Capture More Value with CV3 Platform

SoC Strategy
Horizontal and vertical processor consolidation

Software Strategy
Module portfolio expanding “up-the-stack”

<table>
<thead>
<tr>
<th>Active Safety (ADAS)</th>
<th>Autonomy</th>
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<tbody>
<tr>
<td>Dataloggers</td>
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<tr>
<td>Front ADAS</td>
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<tr>
<td>eMirrors</td>
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<tr>
<td>In Cabin</td>
<td>L2+</td>
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<tr>
<td>L4</td>
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Incremental Strategy

Algorithms (camera & radar)
Operating Systems
Software Development Kits
Tool Chains
Libraries
Microcode
Drivers

CV3 adds fusion and planning to existing camera perception

Oculi adds radar perception to existing camera perception

SW strategy adds value on top of the growing SoC value
CV3 Platform – CV3 SoC Family
Single-Chip Processing for L2+ to L4 AVs

• **Scalable** family for ADAS, and L2+ to L4 AVs
  • Covers edge, zonal and central domain architectures
  • Multi-sensor perception, fusion and path planning

• Based on analysis of hundreds of algorithms
  • open-source, internal and customer

• **3-4x CVflow® Power and DRAM efficiency** over CV2

• Improved security with **hardware security module**

• **5nm** process technology

**Perception Processing**
- Camera
- Radar
- Lidar

**Deep Fusion Processing**
- Detection
  - Lane, Traffic sign, Obstacles, ...
- Classification
  - Car, Bus, Bicycle, Pedestrian, ...
- Segmentation
  - Free space, Road, Sidewalk, ...

**Planning Processing**
- Driver Assistance
  - Emergency Braking, Lane Assist...
- Automated Driving
  - Traffic Jam Chauffeur, Robotaxi...
Ambarella Unveils Full Software Stack for Autonomous and Semi-Autonomous Driving, Optimized for its CV3-AD Central AI Domain Controller Family

Dec 12, 2023  Santa Clara, CA

Ambarella’s Autonomous Driving (“AD”) Software Stack History

1991: Mile Miglia 2000 km on Italian highways 54% autonomous driving
1993: VAC from 15K km cross-country drive AD following
1994: DVEVA, 13 stereo camera systems, CV integration, 100% AD
2015: Ambarella acquires Vislab
2015: CV3 Platform – Autonomous Driving Software IP
2016: CES 2018: camera perception stack demonstrated on CV1
2017: CES 2019: AD driving on the roof of the Lingotto building in Turin
2018: CES 2020: L4 autonomous driving demo is new Osra™ radar based sensing suite
2020: CES 2022: L4 autonomous driving demo on CV3

Ambarella’s Full AD Software Stack Optimized for CV3 SoCs

360° camera perception
360° radar perception
Data fusion and tracking
Localization
Path planning
Deep learning AI intensive SW stack relative to most SW stack competitors
6-Year Automotive Revenue Funnel 4.0 ~$2.4B

Consistent methodology: 
- **Won** = notified of award with 1 discount factor
- **Pipeline** = in the bidding process with 2 discount factors (1) confidence in customers revenue forecast for a project and (2) probability of winning a project

- With our auto business expected to generate ~$80 million in revenue in F2024/C2023, the six-year $2.4 billion funnel is an indication of the strong revenue growth we anticipate from the auto market
  - >90% funnel is AI and a large portion of the AI is CV3

- Significant revisions between funnel 4.0 and funnel 3.0
  - There were a significant number of revisions to the prior funnel including changes in OEM/T1 forecasts and project delays, projects won or lost and the addition of new projects

- Distribution of funnel revenue is exponential in shape
  - Assumptions for auto funnel ASP to rise with time
  - Rising adoption of new technologies in vehicles produced
  - Series production SoP can be ~3 years from award
IoT (non-Auto) Market
~74% F2023 revenue; mostly security/viewing - new AI sensing applications emerging

- **Security market transformation**
  - The security camera market is the largest AIoT market today (Gartner)
  - AI enabled cameras enable video analytics plus human viewing
  - Customer software on our CVflow AI SoCs enables new data driven camera applications and new business models for our customers

- ~1 billion “security camera” installed base C2022
  - Installed base today is almost all human viewing (“2G”) primarily deployed for security applications; ~75% enterprise/public
  - The human viewing installed base is expected to continue to grow while the installed base for AI-based perception is just beginning
  - Installed base replacement rate estimated between 4 to 6 years

- **Security camera unit shipments >200 million in C2022**
  - “3G” CV SoCs command a ~2x ASP versus a similar 2G video processor
  - “1G” analog camera market shrinking – we do not serve this market
  - Ambarella security SAM focusing on higher value market segments
  - Includes Enterprise/Public (majority of installed base) and smart home

- **“Other IoT” ~15% of IoT revenue; emerging and legacy**
  - Today a majority is wearables, AR/VR, aerial drones, and action cameras
  - Also new AI sensing markets such as access control, sensing cameras, fixed robotics and mobile robots for the enterprise and home
Ambarella’s Global IoT Footprint

Enabling most major enterprise, smart city and smart home IoT camera companies

**IoT – Enterprise/Public**
Security – Retail – Transit Systems - ITS - Smart Parking - Schools

- Bosch
- Canon
- Axis Communications
- Motorola
- Avigilon
- Teledyne FLIR
- Hanwha Techwin
- Johnson Controls
- Tyco
- Honeywell
- Stanley
- Pelco
- Vivotek
- Dynacolor
- Verkada
- IDIS

**IoT – Smart Home**
Security – Access Control - Automation - Delivery Services

- Amazon
- Ring
- Alaram.com
- ADT
- BOSCH
- Vivint.
- Blackstone Group
- Nanit
- Comcast Xfinity
- Lumi
- LifeShield
- Logitech
- SimpliSafe
- Vivotek
AI Leads to Emerging IoT Opportunities

Moving beyond traditional “human viewing security” to include camera and radar perception processing, sensor fusion processing (of many sensing modalities), as well as central domain controller processing

Robotics platform announced at CES 2020 – mobile and fixed robotics

- Robotic software development kit (“SDK”) is a unified software infrastructure targeting home and enterprise robotics for assistance, automation, cleaning, delivery, surveillance, warehouse, etc.
- SDK provides access and acceleration for common robotic functions including stereo, object detection, key points tracking, occupancy grid, visual odometry.

ID/Authentication for access control and smart lock applications

- Use of biometric technology (e.g. face ID) to identify and authenticate individuals for access control in enterprise, home and public applications including panels, smart locks and payment terminals
- Low cost single-camera fusion of multiple sensors for optimal accuracy

Sensing and counting cameras

- Analyze capacity, monitor elderly, customer patterns, foot traffic, line counting, social distancing, property management, and HVAC energy efficiency while maintaining privacy and not recording
Ambarella CES2024

Strong customer turnout for AI inference products and technology demos

• ~35 AI inference processor demos

• Introduced N1 for gen AI at edge up to 34B parameter models introduced Cooper Development Platform; demo of multi-modal LLM LLaVA, LLaMA v2, Code Co Pilot demos; Quanta partner

• Introduced two new CV3-AD Central Domain Controller SoCs targeting high volume L2+ passenger vehicle applications creates broad CV3 platform scalability (up to 18x CV72 to CV3-AD685) enabling OEMs to re-use/port SW stack across their vehicle portfolio from L2 to L4; samples Q1 2024

• EVA L4 demo vehicle update Full SW stack 100% owned by Ambarella; primarily AI deep learning module based; does not use HD maps (only SD); integrates Oculii radar perception algos; raw radar data (5 sensors) centrally processed on CV3
Q4 (January) F2024 Outlook and Q3 (October) F2024 Recap

Q4 F2024 (January, 2024) Outlook
- Our Q4 revenue guidance is $50.0 million to $53.0 million (consensus estimate was ~$50.3 million on November 29th)
- Sequential revenue growth could continue into our Q1 F2025 (April 2024) in the low to mid-single digit percentage range (consensus $54.0M)
- Q4 non-GAAP gross margin estimated to be 62.0% to 63.0% (consensus 63.3%) with non-GAAP operating expense $45.0 to $48.0 million (consensus $48.1M)

Q3 F2024 (October, 2023) Results
- Revenue of $50.6 million was 1% higher than the mid-point of our guidance range of $50.0 million plus or minus 3% (consensus estimate ~$50.0 million)
- Non-GAAP gross margin was 62.6% versus the consensus estimate of 63.0% and non-GAAP operating expense was $44.1 million (consensus $47.4M)
- Non-GAAP loss per share was $0.28 versus the consensus estimate for a loss per share of $0.39

Despite the challenges we continue to make progress in our multi-year transformation
- AI computer vision is becoming pervasive, we are embedding it in all our new products and we have growing evidence of market acceptance
- We see a wide variety of risks outstanding, including pandemic, geopolitical and supply chain factors. These risks include*:
  - customers’ are continuing to reduce their levels of inventory
  - potential export regulations on advanced technologies
  - market share shifts between our customers
  - the evolution of new markets and rates of adoption of new technologies
  - customers seeing some pockets of end-market demand weakness
  - supply chain issues such as long leadtimes, shortages of materials, components, electricity and manufacturing capacity, and adverse weather conditions
  - changes to tariffs and/or the Entity List
  - the risk customers in China continue to take actions to reduce their dependence on components they believe could be subject to new export controls, including the creation of dual China/non-China supply chains

*Potential risk factors that could affect our financial results are more fully described in the documents that we file with the SEC, including annual reports on Form 10-K and quarterly reports on Form 10-Q.