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Centre for Information Policy Leadership (CIPL) and Singapore Personal Data Protection  
Commission (PDPC) Joint Interactive Working Session

## **Accountable and Responsible AI**

16 November 2018, Singapore



Centre for  
Information  
Policy  
Leadership  
Hunton Andrews Kurth LLP

# Welcome Address

**Bojana Bellamy**, President, CIPL



Centre for  
Information  
Policy  
Leadership  
Hunton Andrews Kurth LLP

# Opening Remarks

**Yeong Zee Kin, Deputy Commissioner, PDPC**



Centre for  
Information  
Policy  
Leadership  
Hunton Andrews Kurth LLP



PERSONAL DATA  
PROTECTION COMMISSION  
SINGAPORE

# Opening Remarks

**YEONG ZEE KIN**  
**Deputy Commissioner, PDPC**





# SUPPORTING AI DEVELOPMENT AND ADOPTION THROUGH GOVERNANCE AND ETHICS

- 1** **Bringing relevant stakeholders together to build a trusted ecosystem**  
(such as Government, Industry, Consumers, and Academia)
- 2** **Supporting AI adoption through model governance frameworks that promote responsible AI and data use for voluntary adoption by corporates**
- 3** **Funding research to identify and create solutions for legal, regulatory and policy issues as AI adoption broadens**



# ADVISORY COUNCIL ON ETHICAL USE OF AI AND DATA

- Provide guidance on complex ethical issues arising from new business models and innovations in the AI space
- Bring together AI technology providers, businesses that use AI and representatives of consumer interests
- Host conversations with industry and consumers
- Serves as an effective barometer of business needs and ground sentiments to shape the Government's plan for a sustainable AI ecosystem

# A BALANCED GOVERNANCE FRAMEWORK TO ENGENDER TRUST & ENABLE INNOVATION

PROMOTE RESPONSIBLE USE OF AI, ADDRESS ETHICAL RISK, AND BUILD CONSUMER TRUST

**Accountability-based framework** – ready to use tool for orgs deploy AI in a responsible manner

- 1. Integrating AI ethics into corporate governance and risk management structures** e.g. corporate values, risk management frameworks, decision-making and risk assessment
- 2. Translating responsible AI from principles into processes** e.g. data curation, addressing data bias, responsibilities in AI model selection, unintended discrimination, model tuning
- 3. Establishing good consumer interactions** e.g. AI-human interactions, managing customer-relations when automating decision-making, explaining decision-making process

# 5-YEAR RESEARCH PROGRAMME TO DEVELOP THOUGHT LEADERSHIP

- Centre for AI & Data Governance in Singapore Management University's School of LAW
- Build up body of knowledge of the legal, policy and governance issues concerning AI and data us
- Develop a pool of experts knowledgeable in these issues
- Complement scientific AI research and professional training to build a robust AI ecosystem





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PERSONAL DATA  
PROTECTION COMMISSION  
SINGAPORE

# Thank You

- ❖ 8:30 AM      **Registration**
- ❖ 9:00 AM      **Welcome Address**
- ❖ 9:05 AM      **Opening Remarks**
- ❖ 9:15 AM      **Session I: Presentations on Applications of Artificial Intelligence**
- ❖ 10:30 AM      **Break**
- ❖ 11:00 AM      **Session I (continued): Discussion with Session I Panelists**
- ❖ 12:00 PM      **Morning Session Recap**
- ❖ 12:15 PM      **Lunch**
- ❖ 1:30 PM      **Introduction of PDPC Singapore's Proposed Model AI Governance Framework**
- ❖ 1:50 PM      **Session II: Accountable and Responsible AI in Practice**
- ❖ 3:10 PM      **Break**
- ❖ 3:30 PM      **Session II (continued): Discussion Among All Workshop Participants**
- ❖ 4:30 PM      **Closing Remarks**
- ❖ 4:45 PM      **End of Workshop**

## Session I: Presentations on Applications of Artificial Intelligence

- ❖ **Moderator: Fred Cate**, Senior Policy Advisor, CIPL
- ❖ **Srinivasa Rao Aravilli**, Senior Engineering Manager – AI/ML Applications, Cisco
- ❖ **Daryl Arnold**, Chairman, DEX
- ❖ **Shane Witnov**, Privacy and Public Policy Manager, Facebook
- ❖ **Peter Fleischer**, Global Privacy Counsel, Google
- ❖ **Dr. Laura Wynter**, Head of RealWorld AI Group, IBM
- ❖ **Richard Koh**, Chief Technology Officer, Microsoft Singapore



# Applications of AI/ML






Srinivasa Rao Aravilli  
Senior Engineering Manager, Cisco  
November, 2018



# Examples of Cisco Leveraging AI/ML



## Security is Foundational

-  AMP
-  Cloudlock
-  Cognitive Threat Analytics
-  NGFW
-  Stealthwatch
-  Talos
-  Umbrella



## Reinvent the Network

-  Assurance
-  ETA
-  Network Early Warning




## Power a Multicloud World

-  Hyperflex
-  Intersight
-  UCS



## Unlock the Power of Data

-  AppDynamics
-  Kinetic
-  Tetration



## Create Meaningful Experiences

-  Accompany
-  CAM
-  Meraki
-  MindMeld
-  Talent Trends
-  Webex

# Network Early Warning



# The Impact of a Network Outage

## Revenue Impact

Reputation, Loyalty, Legal, Labor Cost

### The Mercury News

Services are returning to normal Tuesday after a **hardware issue** led to an outage on voice, video, and internet services for **several hours**.

Large pockets of **outages** occurred in such areas as Boston, San Francisco, Seattle, and Portland.

The hashtag **#<name>Outage** was also trending nationally on Twitter.



UPDATE: our teams continue to monitor an external network issue. We apologize for the inconvenience & will provide updates as we learn more.

12:42 PM ·

112 158 people are talking about this



Reputation  
marketing



Data Loss  
legal



Labor  
revenue

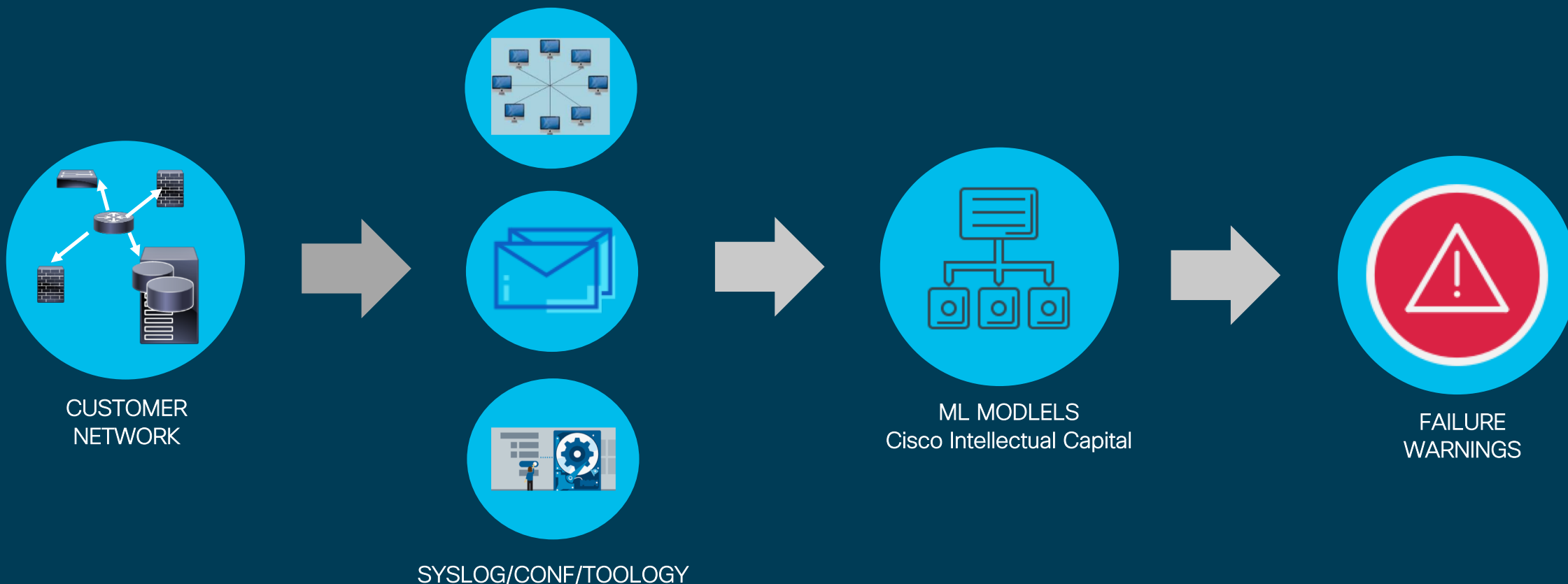
## Labor Cost

Fortune 500 Company

\$46M

# Network Early Warning

*Deliver 100% network uptime by predicting network failures with enough lead time to deploy a successful and timely remediation*



# *Data Sets, Bias and Data Protection – NEW case*

- Data Sets which includes holistic information
  - *Historic Syslog messages and network/device data – Billions of Syslog messages and network/device data*
- Data Protection Techniques and Policies
  - *Applied security of data at rest, in motion and at edge*
  - *Anonymization of the unstructured data using ML/DL – to process and share the results*

# *Data Sets, Bias and Data Protection – NEW case*

- Inherent Bias
  - *Applied noise filtering in the data to avoid bias*
  - *seasonal , temporal , outliers are addressed in processing*
- Model Bias
  - *Tested with multiple parameters of the Model and NCE's/SME's verifies the approved events/patterns by applying the Intellectual Capital/rules*
- Adversarial attack
  - *Adversarial training: Training set includes the adversarial examples.*

# Encrypted Traffic Analysis



# Economic Impact of Malicious Attacks

81%

Organizations have been victims of a cyber attack

200 days

Industry average detection time for a breach

41%

Attackers used encryption to evade detection

60 days

Industry average time to contain a breach

64%

Cannot detect malicious content in encrypted traffic

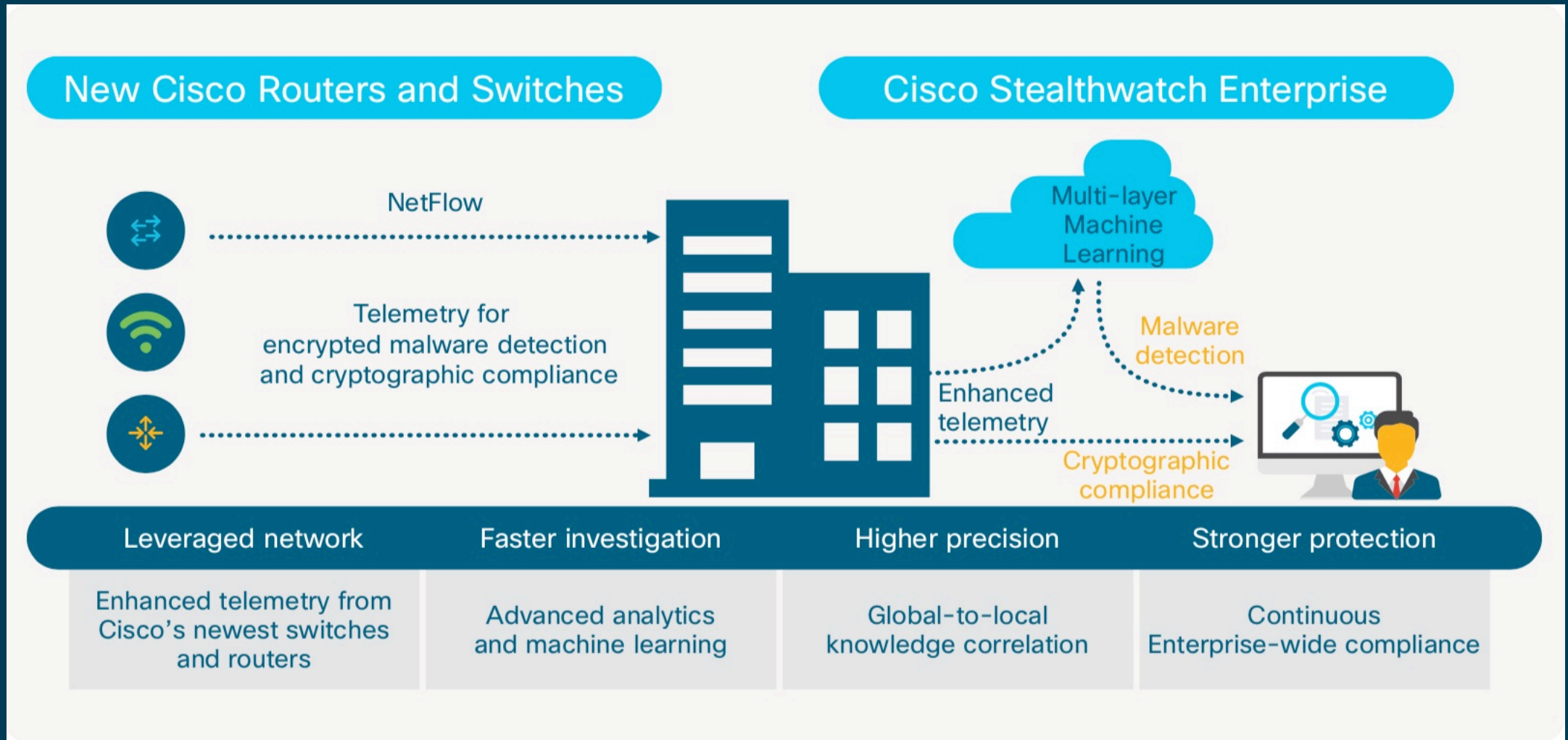
\$3.8M

Average cost of a data breach

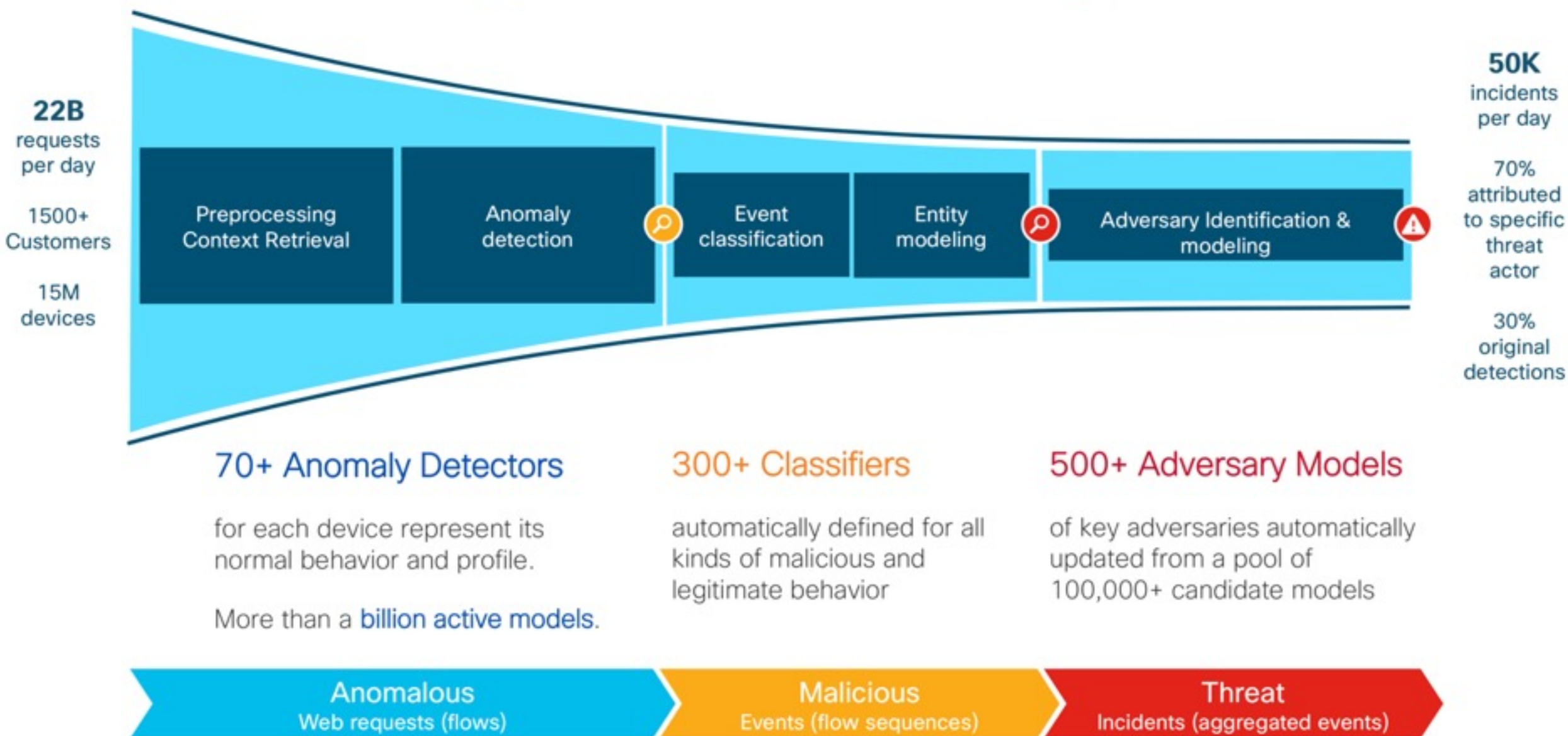


# ETA – Encrypted Traffic Analytics

Offers insight into hidden threats in encrypted traffic, without having to decrypt it, through network analytics and machine learning



# Cognitive Intelligence – Traffic Analysis Funnel



# *Data Sets, Bias and Data Protection – ETA case*

- Data Sets which includes holistic information
  - *Netflow data, TLS Data, Initial Data Packets*
  - *Open source Data Sets*
- Data Protection Techniques and Policies
  - *Data analyzed/processed without decrypting the data using ML and DL*
- Adversarial attack
  - *Some of the features (inter-packet timing, TLS/HTTP proxy manipulations) are not in complete control of the adversary.*
  - *ETA is composed of hundreds of classifiers operating on orthogonal feature set, so many of these classifiers needs to be escaped for a successful attack*

# Questions





facebook

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# Applications of Artificial Intelligence



Shane Witnov

Privacy and Public Policy Manager





WE USE AI TO:

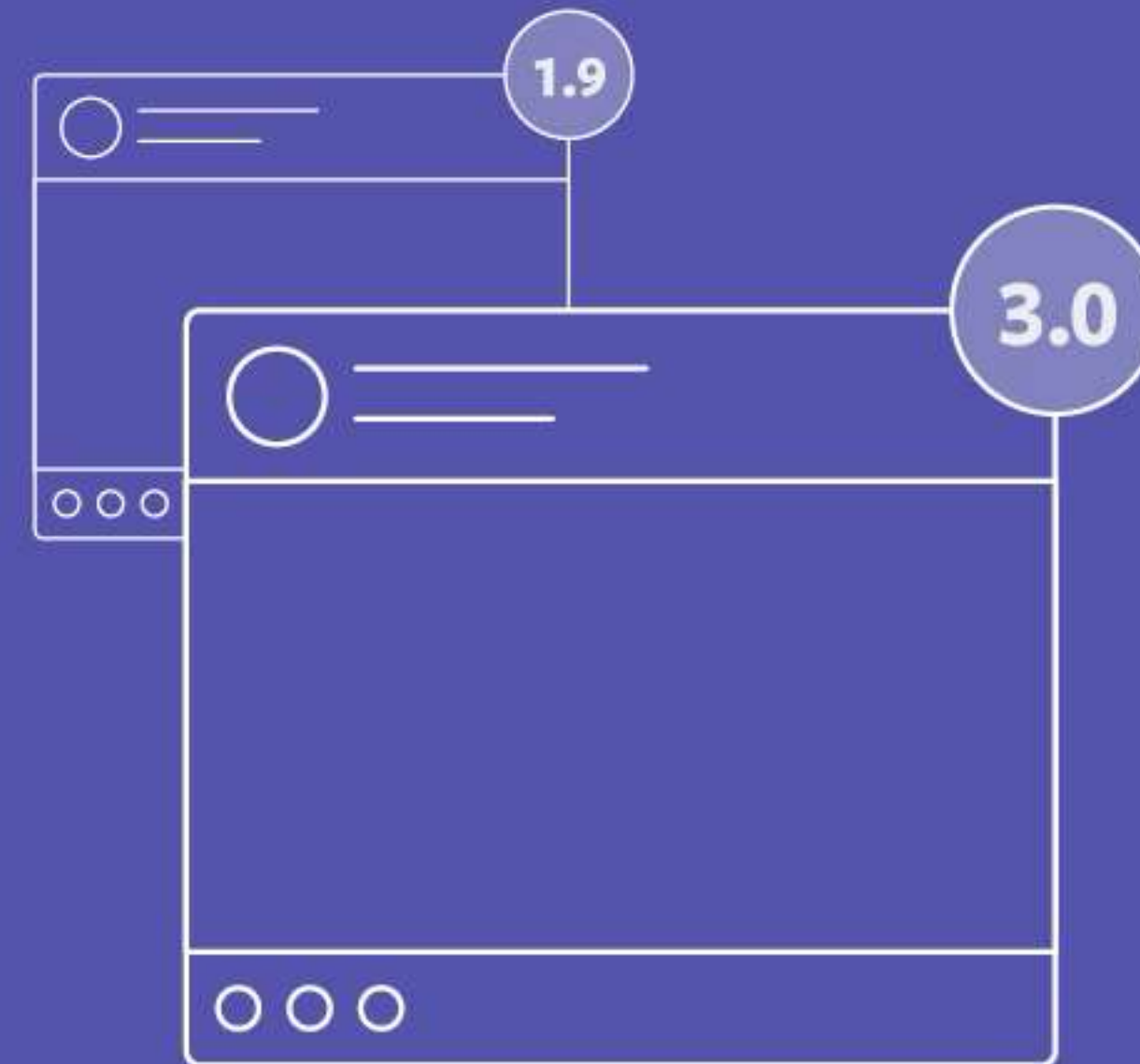
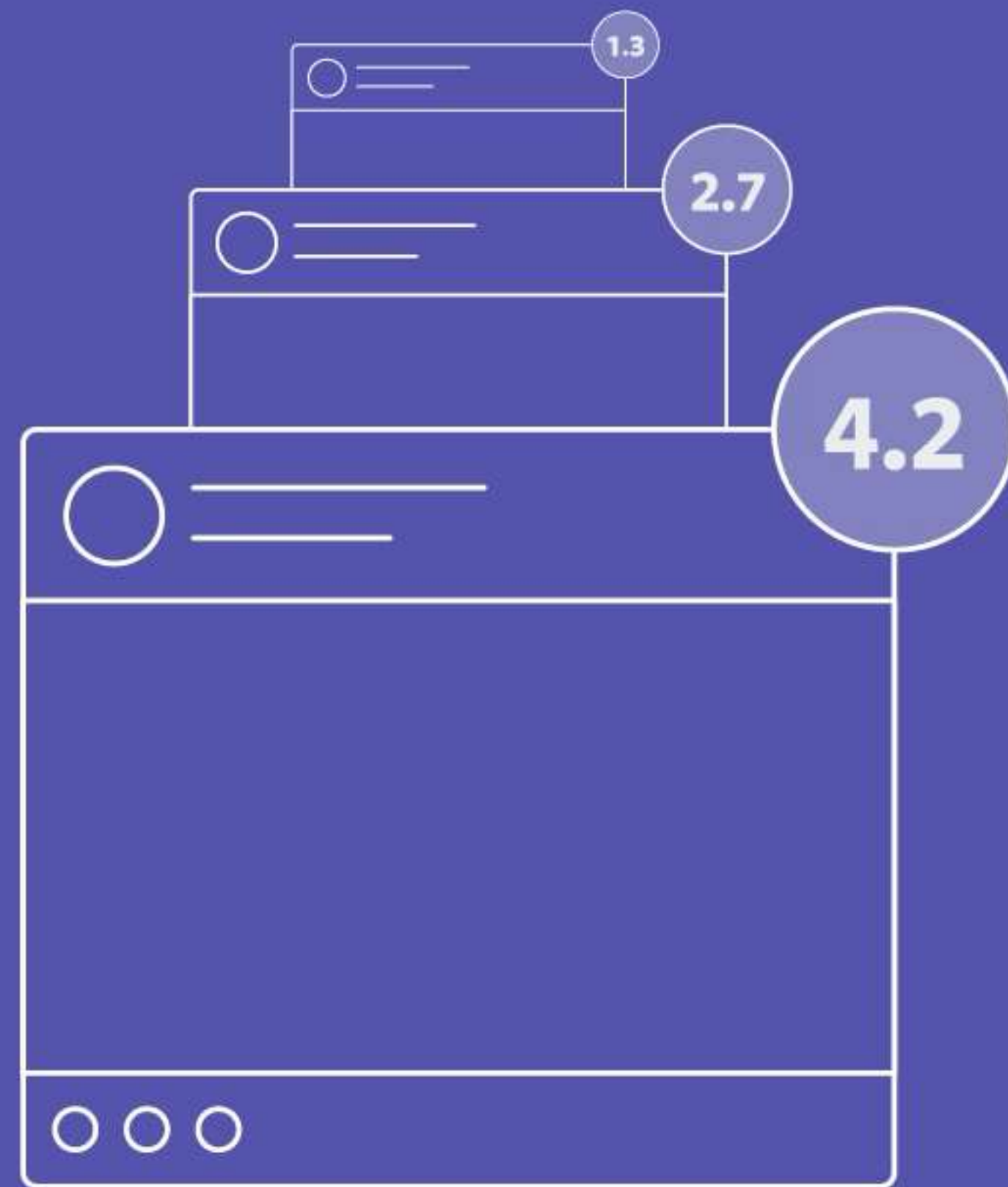
Promote meaningful social  
interaction

Understand images and  
text

Keep our community  
safe

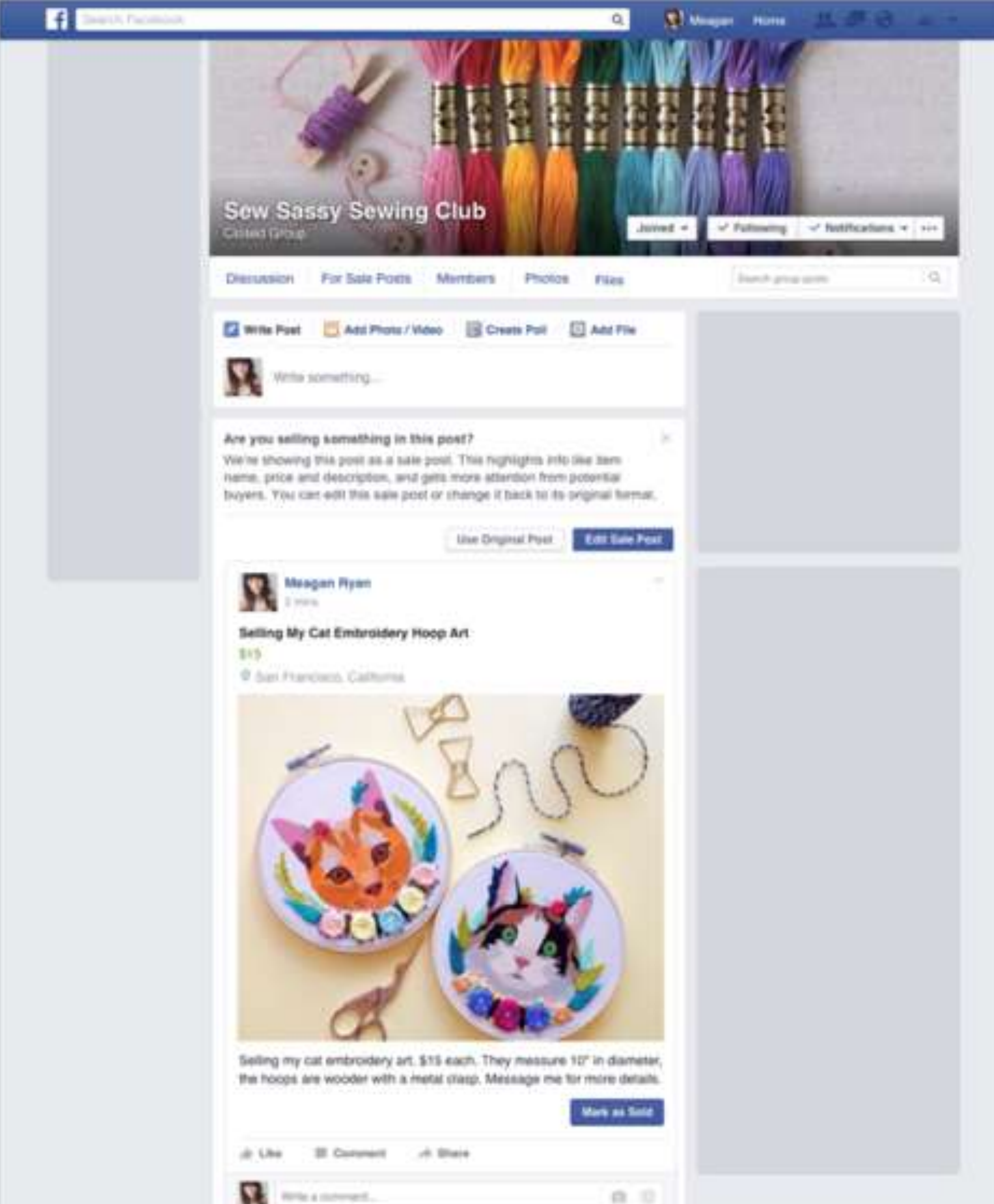


# News Feed





# Smart Posts



This screenshot shows a Facebook group interface for the 'Sew Sassy Sewing Club'. The group's cover photo features a row of colorful embroidery threads. Below the cover, navigation tabs include 'Discussion', 'For Sale Posts', 'Members', 'Photos', and 'Files'. A post by 'Meagan Ryan' is displayed, titled 'Selling My Cat Embroidery Hoop Art' with a price of '\$15'. The post includes a photo of two circular embroidery hoops with cat faces. A 'Mark as Sold' button is visible at the bottom of the post.

**Sew Sassy Sewing Club**  
Closed Group

Joined • Following • Notifications •

Discussion For Sale Posts Members Photos Files

Write Post Add Photo / Video Create Poll Add File

Write something...

**Are you selling something in this post?**  
We're showing this post as a sale post. This highlights info like item name, price and description, and gets more attention from potential buyers. You can edit this sale post or change it back to its original format.

Use Original Post Edit Sale Post

**Meagan Ryan**  
2 mins

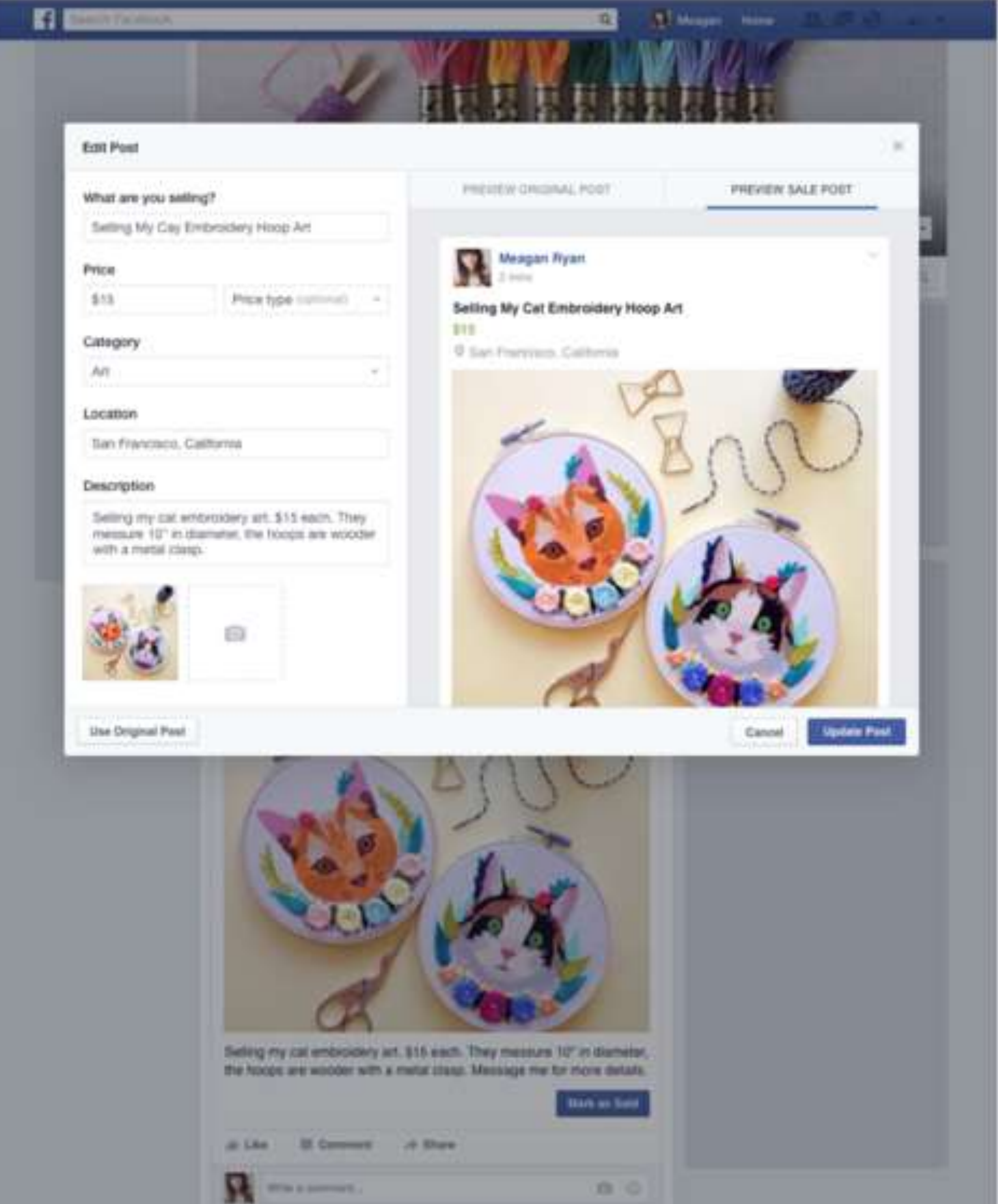
**Selling My Cat Embroidery Hoop Art**  
\$15  
San Francisco, California

Selling my cat embroidery art. \$15 each. They measure 10" in diameter, the hoops are wooden with a metal clasp. Message me for more details.

Mark as Sold

Like Comment Share

Write a comment...



This screenshot shows the 'Edit Post' dialog box for the same post. It has two tabs: 'PREVIEW ORIGINAL POST' and 'PREVIEW SALE POST'. The 'PREVIEW SALE POST' tab is active, showing a preview of the post with the sale information. The 'Edit Post' form on the left includes fields for 'What are you selling?' (Selling My Cat Embroidery Hoop Art), 'Price' (\$15), 'Category' (Art), 'Location' (San Francisco, California), and 'Description' (Selling my cat embroidery art. \$15 each. They measure 10" in diameter, the hoops are wooden with a metal clasp. Message me for more details.). There are buttons for 'Use Original Post', 'Cancel', and 'Update Post'.

**Edit Post**

PREVIEW ORIGINAL POST PREVIEW SALE POST

**What are you selling?**  
Selling My Cat Embroidery Hoop Art

**Price**  
\$15 Price type (optional)

**Category**  
Art

**Location**  
San Francisco, California

**Description**  
Selling my cat embroidery art. \$15 each. They measure 10" in diameter, the hoops are wooden with a metal clasp. Message me for more details.

Use Original Post Cancel Update Post

**Meagan Ryan**  
2 mins

**Selling My Cat Embroidery Hoop Art**  
\$15  
San Francisco, California

Selling my cat embroidery art. \$15 each. They measure 10" in diameter, the hoops are wooden with a metal clasp. Message me for more details.

Mark as Sold

Like Comment Share

Write a comment...



Translation

50%

users have at least one  
friend with a different native  
language

6.5B

translated posts every day  
on Facebook



Xavier Chauve and 62 others

6 Comments



Like



Comment



Share



**Anneli Lindström**

Beautiful wedding! Welcome to the family! 🇸🇪

See Original

1 hour ago

Like

Reply



**Massaër Ndiaye**

Félicitations depuis la Côte d'Ivoire !

See Translation

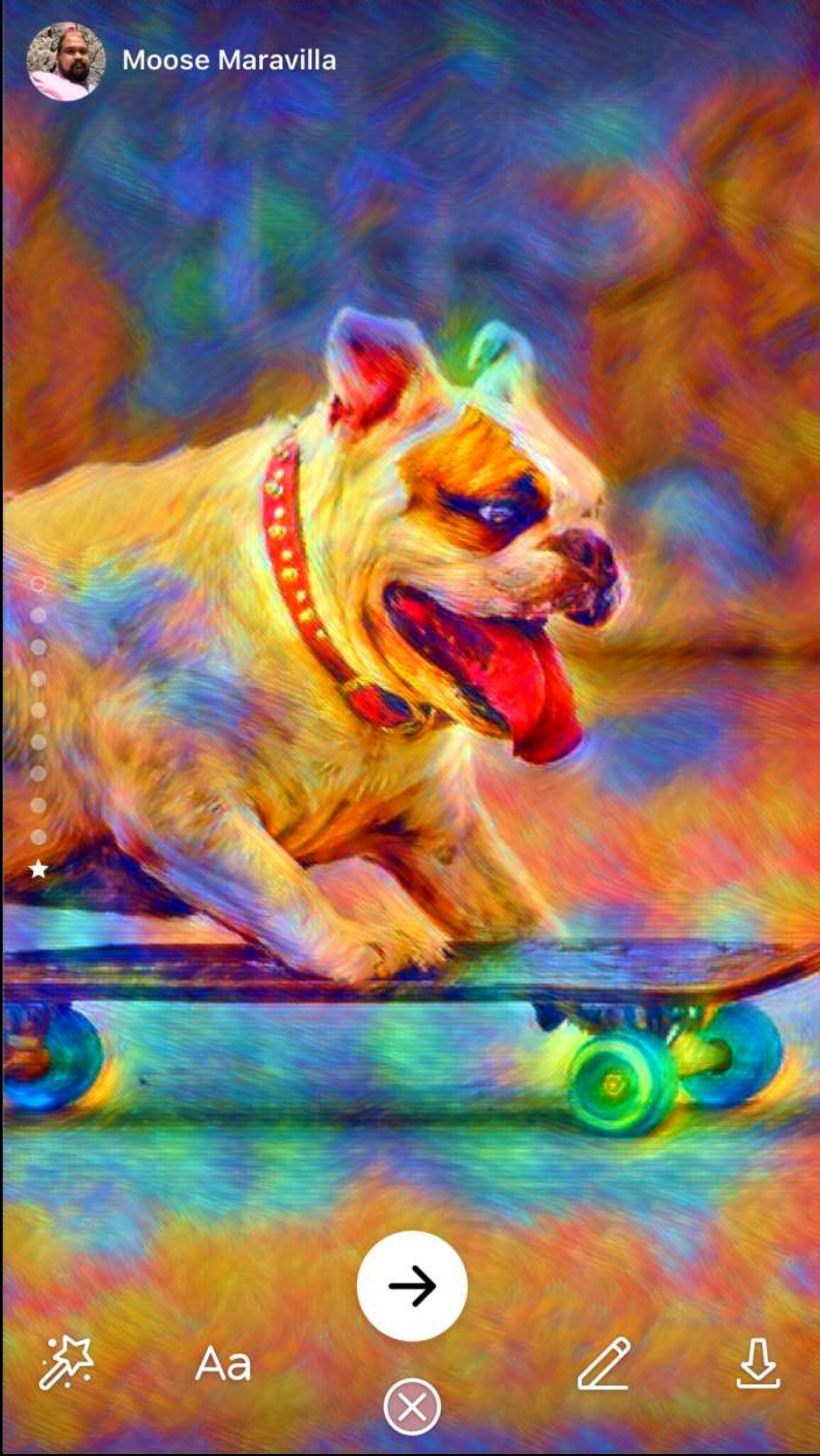
1 hour ago

Like

Reply



# Computer Vision



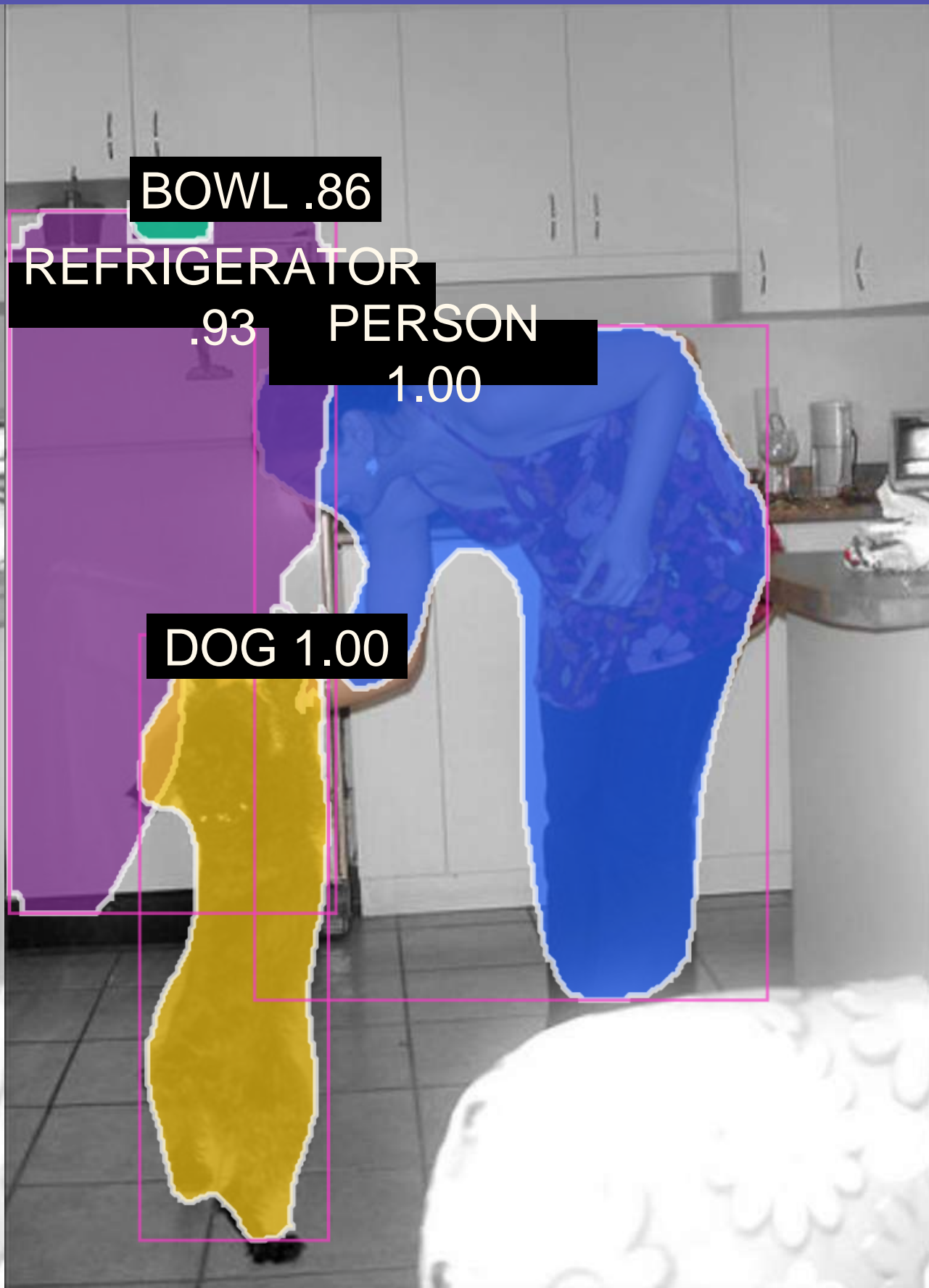


# Computer Vision

ALEXNET (2012)



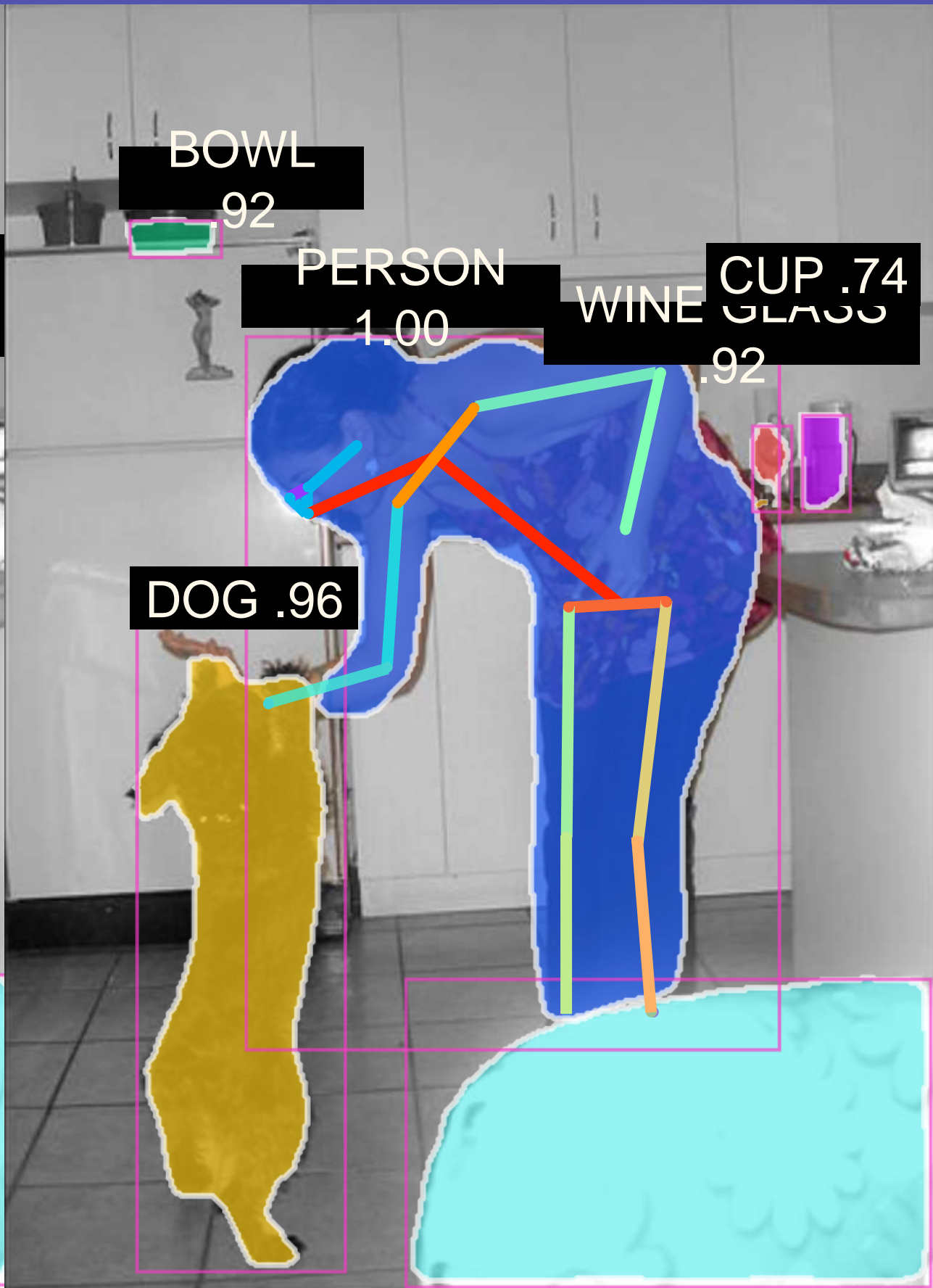
MSRA\_2015 (2015)



MASK R-CNN (2017)



MASK R-CNN (2017)

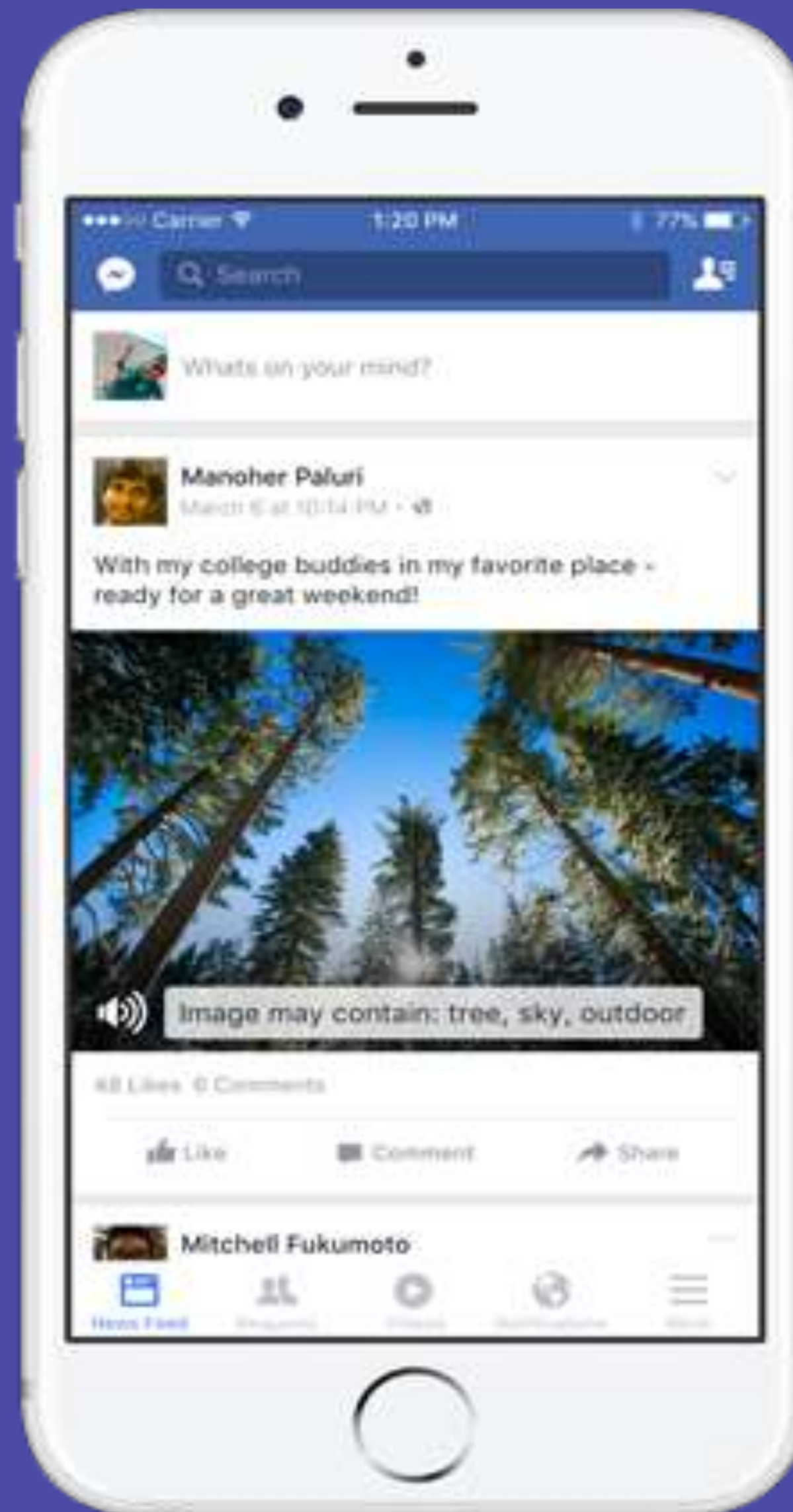
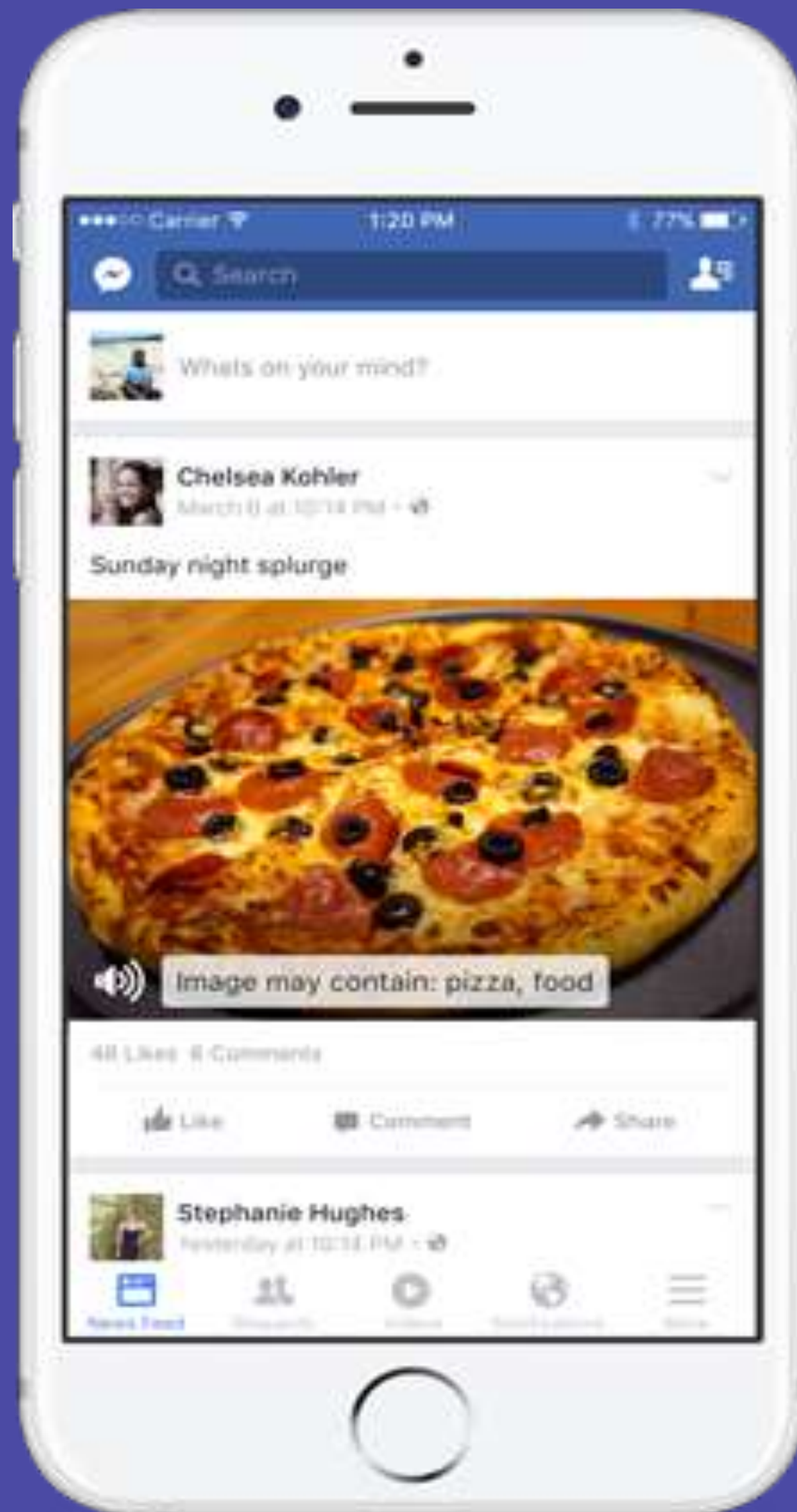






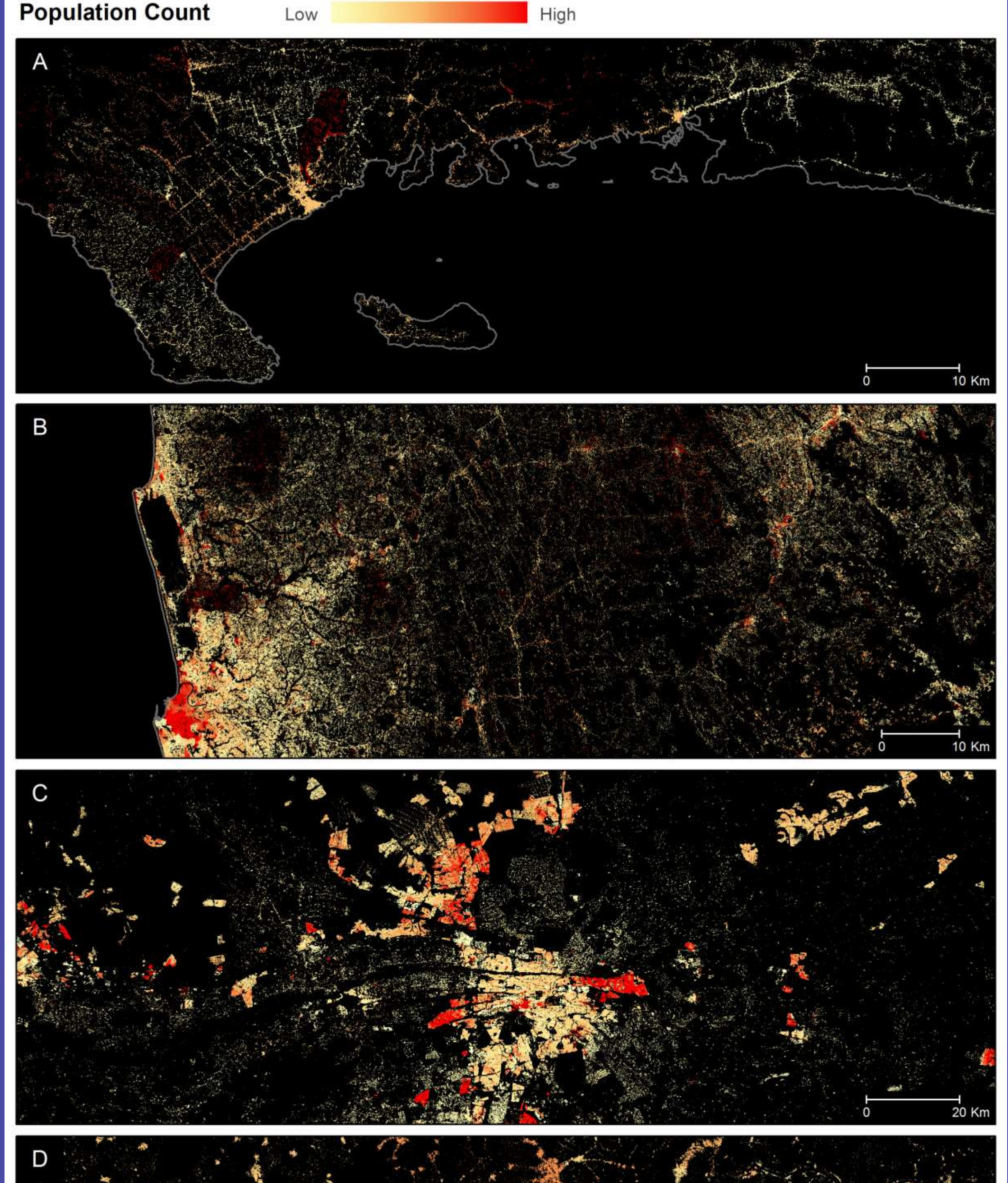
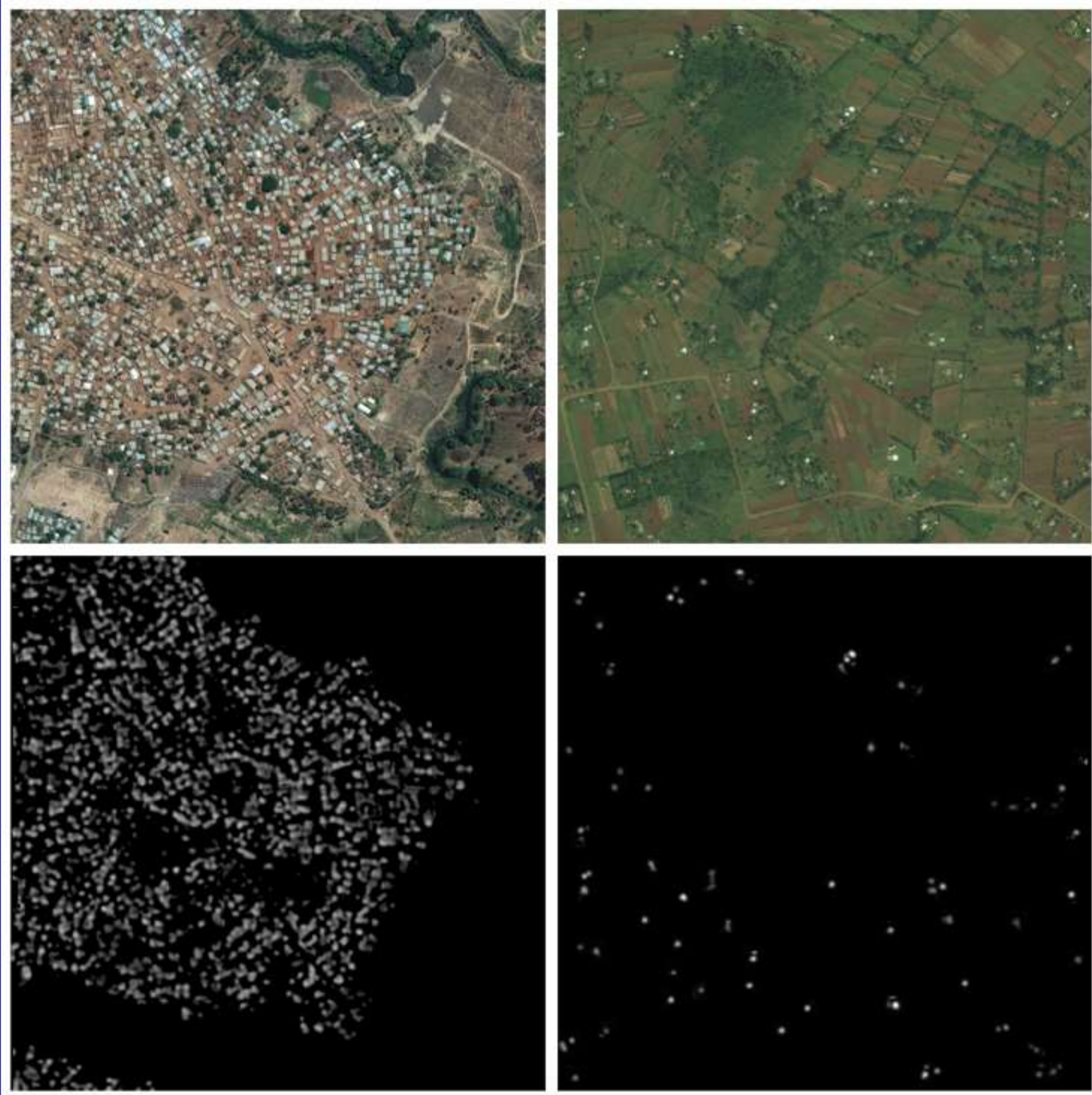


# Accessibility



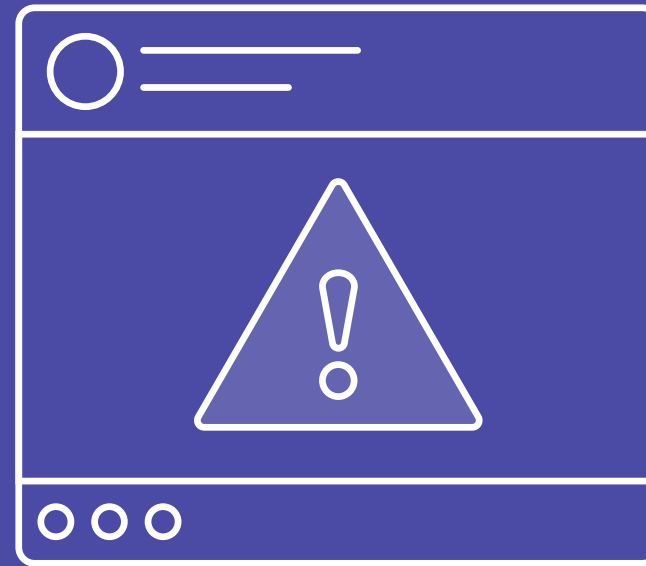


# Population Density

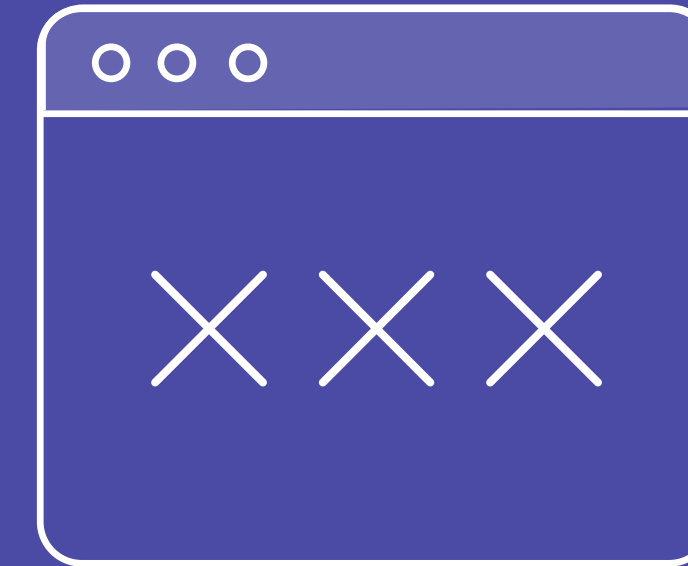




# Facebook Transparency Report



GRAPHIC  
VIOLENCE



ADULT NUDITY &  
SEXUAL ACTIVITY



TERRORIST  
PROPAGANDA



HATE SPEECH

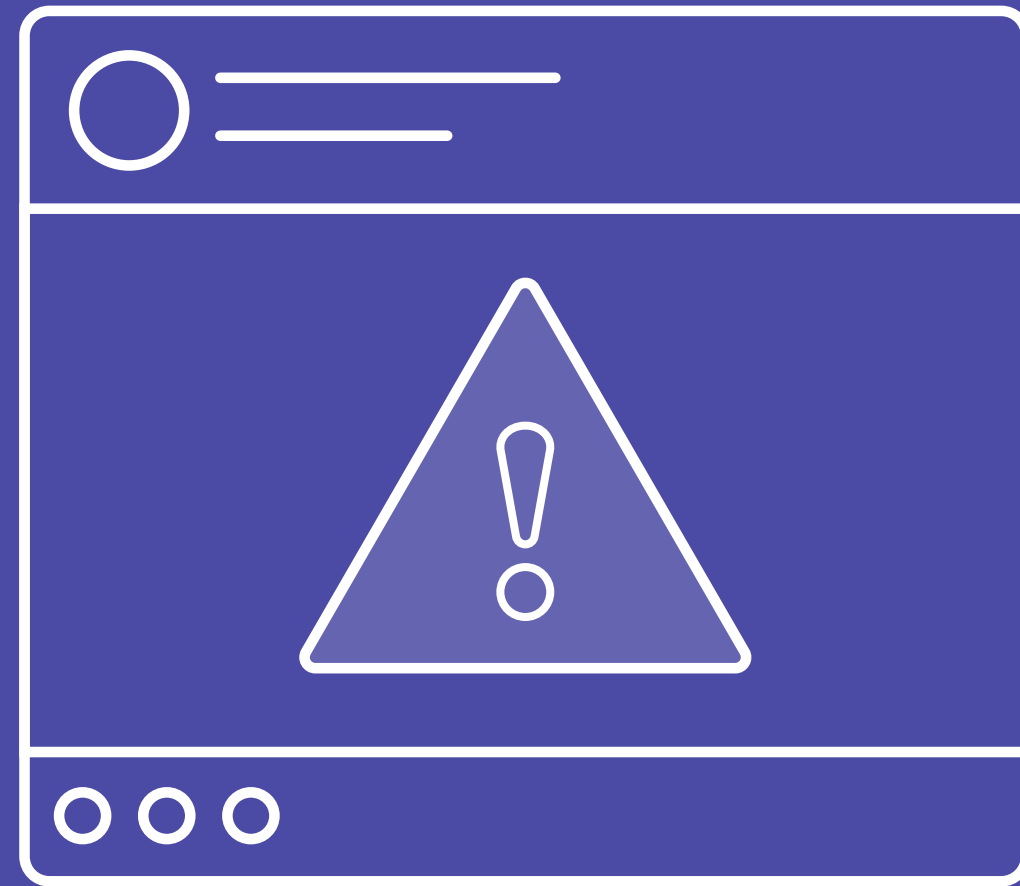


SPAM



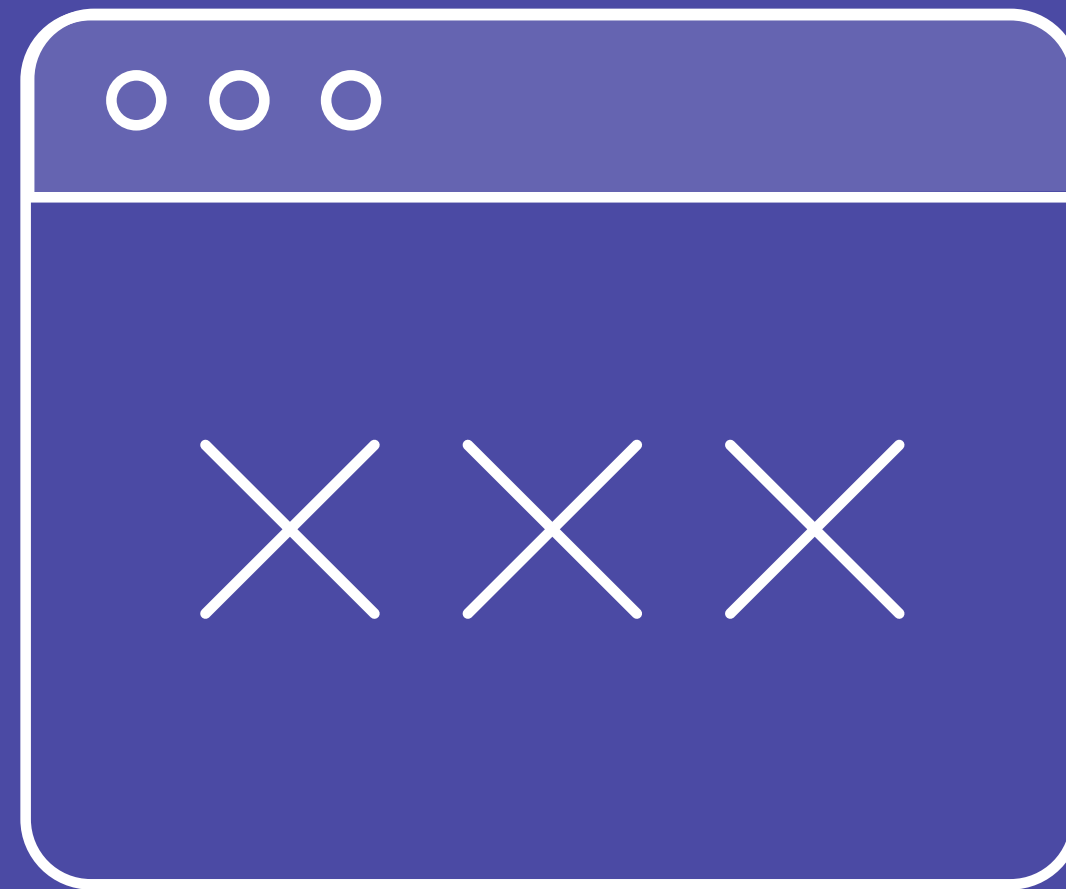
FAKE ACCOUNTS





## GRAPHIC VIOLENCE

We took down or applied warning labels to about 3.5 million pieces of violent content in Q1 2018 — 86% of which was identified by our technology before it was reported to Facebook.



## ADULT NUDITY & SEXUAL ACTIVITY

We took down 21 million pieces of adult nudity and sexual activity in Q1 2018 — 96% of which was found and flagged by our technology before it was reported.



## TERRORIST PROPAGANDA

In Q1 2018, we took action on 1.9 million pieces of content, up from 1.1 million in Q4 2017.

99.5% of content acted on was flagged by Facebook before users reported it (Jan - Mar 2018).



HATE SPEECH

We removed 2.5 million pieces of hate speech in Q1 2018 — 38% of which was flagged by our technology.

# Hate Speech





SPAM

In Q1 2018, we took action on 837 million pieces of content, up from 727 million in Q4 2017.

99.7% of content acted on was flagged by Facebook before users reported it (Jan - Mar 2018).



## FAKE ACCOUNTS

In Q1, we disabled about 583 million fake accounts — most of which were disabled within minutes of registration. 98.5% of content acted on was flagged by Facebook before users reported it (Jan - Mar 2018).

# Applications of AI at Google

Socially-useful, Privacy-sensitive

*Peter Fleischer*  
*Global Privacy Counsel*



classify and filter



Google Photos

Making the content of photos  
searchable, even if it is not labelled

[boats]



Helping to expedite human review and  
takedown of illegal/extremist content

# ARDA: Automated Retinal Disease Assessment

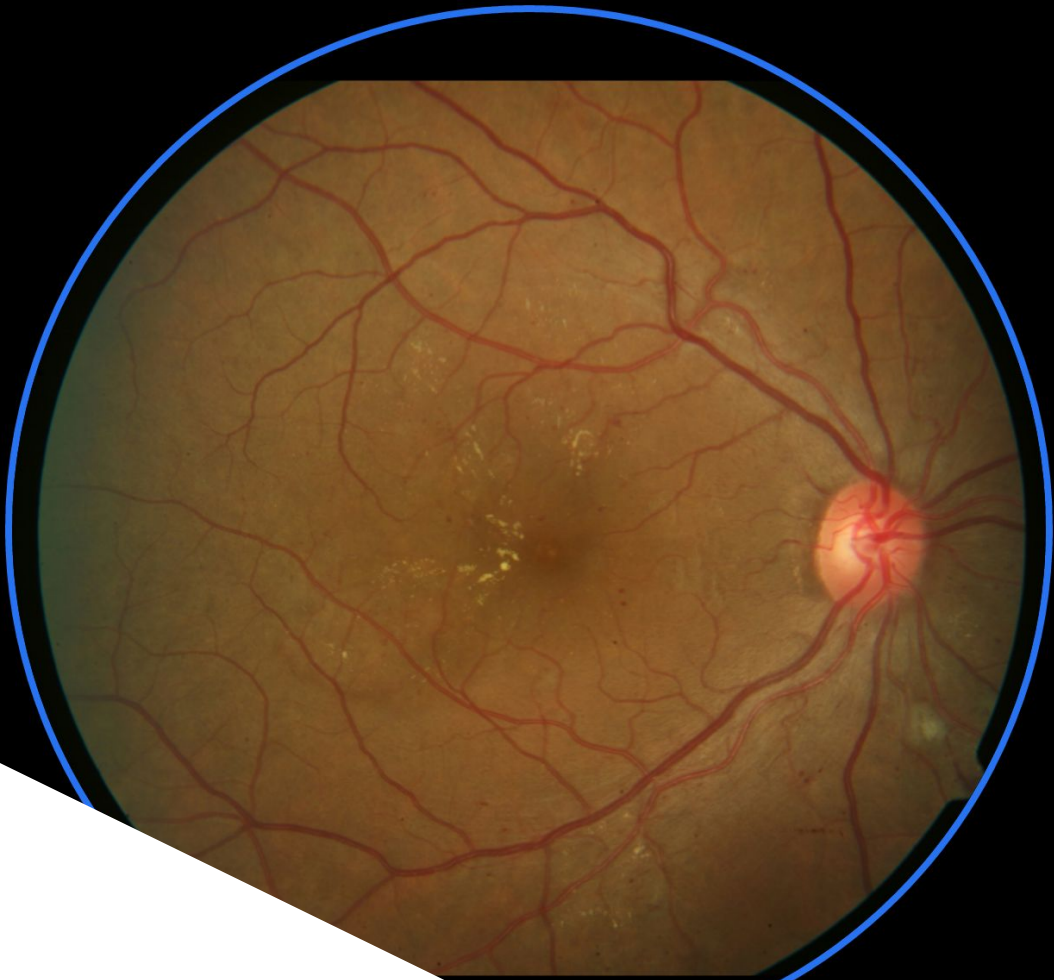
Drag another image to analyze, or [CHOOSE IMAGE](#)

FILENAME (SIZE)  
uploaded-retina-image.jpg (2.11M)

DIABETIC RETINOPATHY GRADE

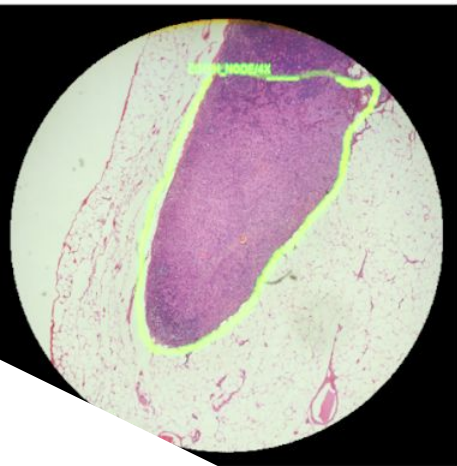


Help doctors in India to provide earlier diagnosis of diabetic retinopathy

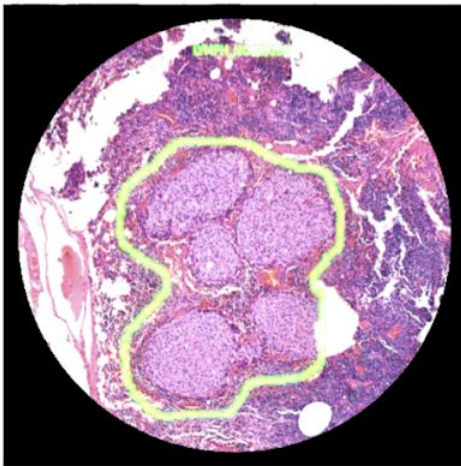




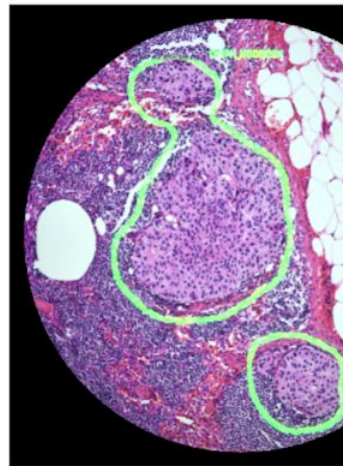
4X



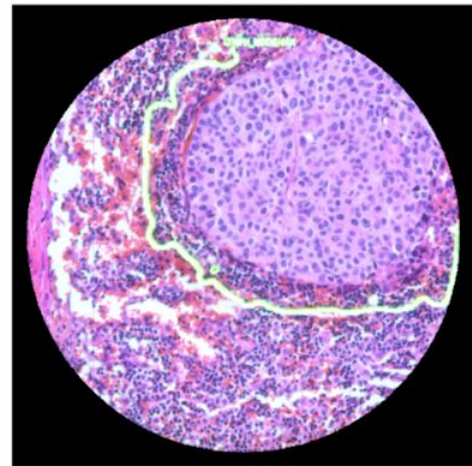
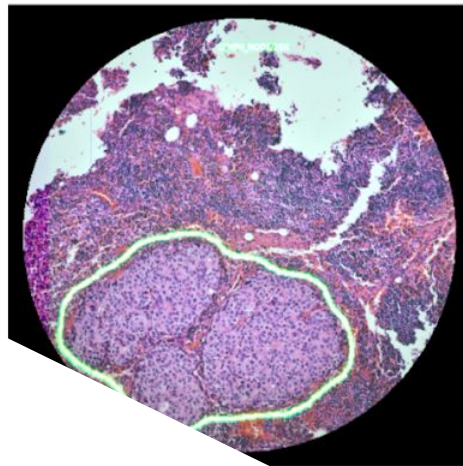
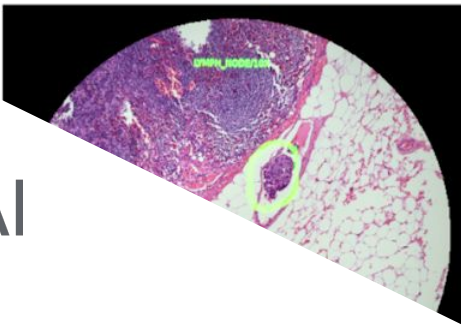
10X



20X



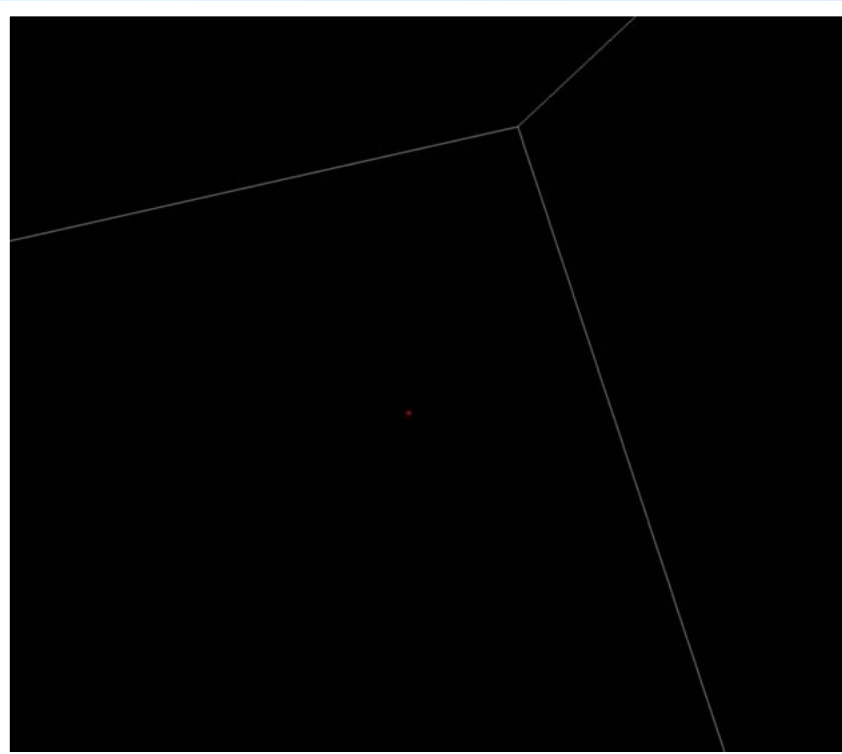
Microscope prototype that helps  
pathologists to detect cancer tumours





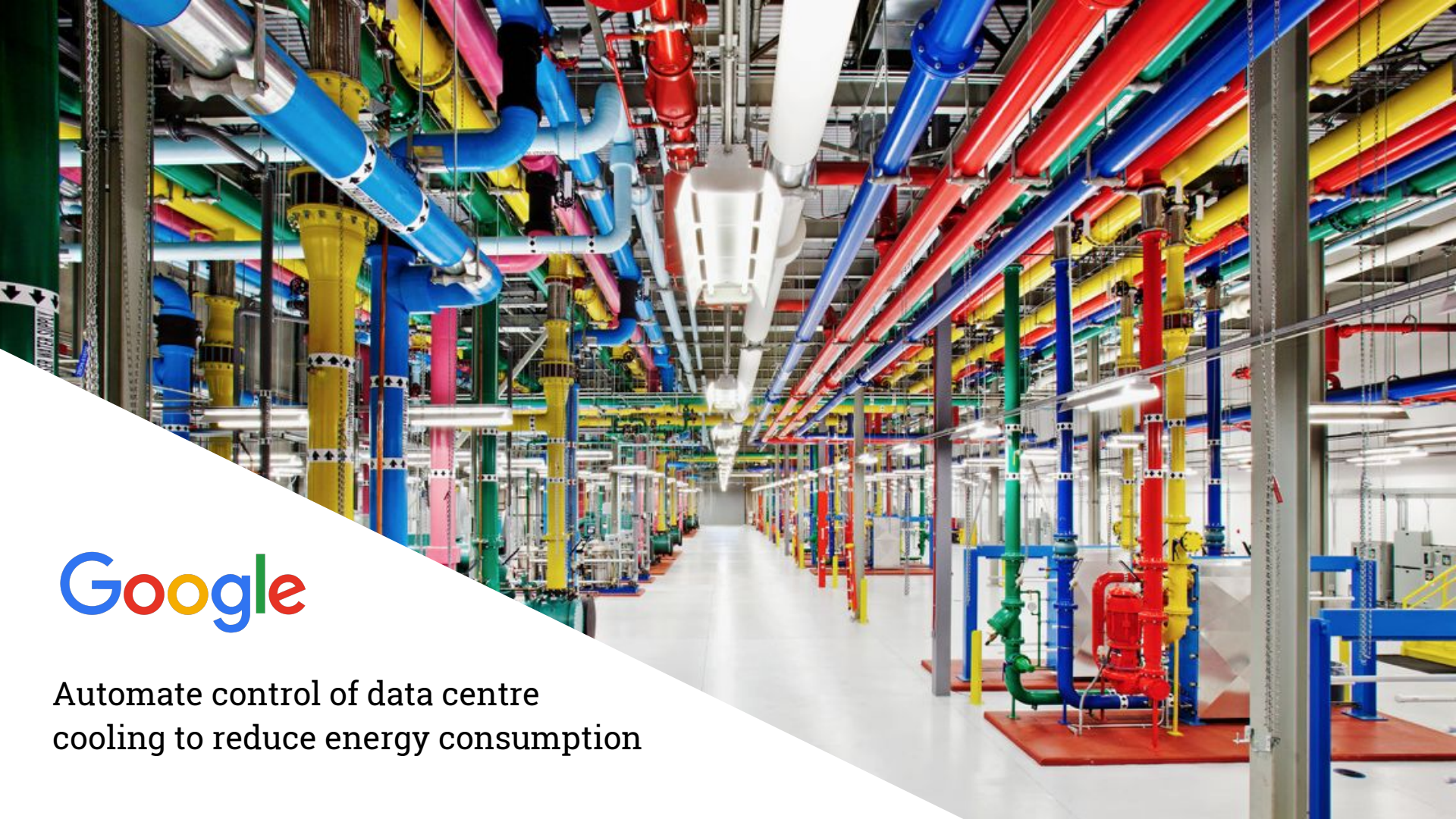
max planck institute of  
neurobiology

Create a comprehensive map of the  
synaptic connections in a songbird's brain



# Real time monitoring and prediction





Automate control of data centre  
cooling to reduce energy consumption





Google Earth Engine

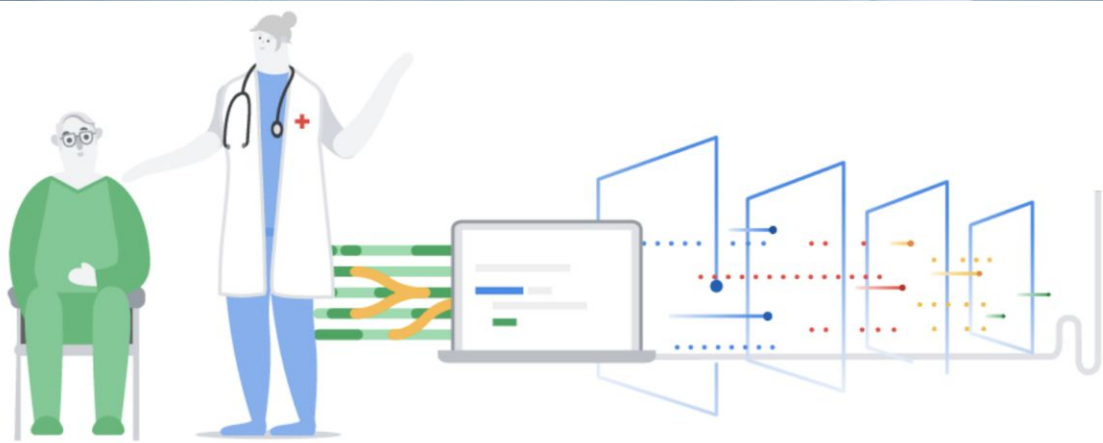
Analyse river readings with 3D mapping  
to better predict floods in India



Set flight paths for balloons providing  
Internet access in remote areas







Apply to hospital records to help  
make better clinical predictions of  
patient needs



**HARVARD**  
UNIVERSITY

Predict locations of earthquake  
aftershocks to aid recovery efforts



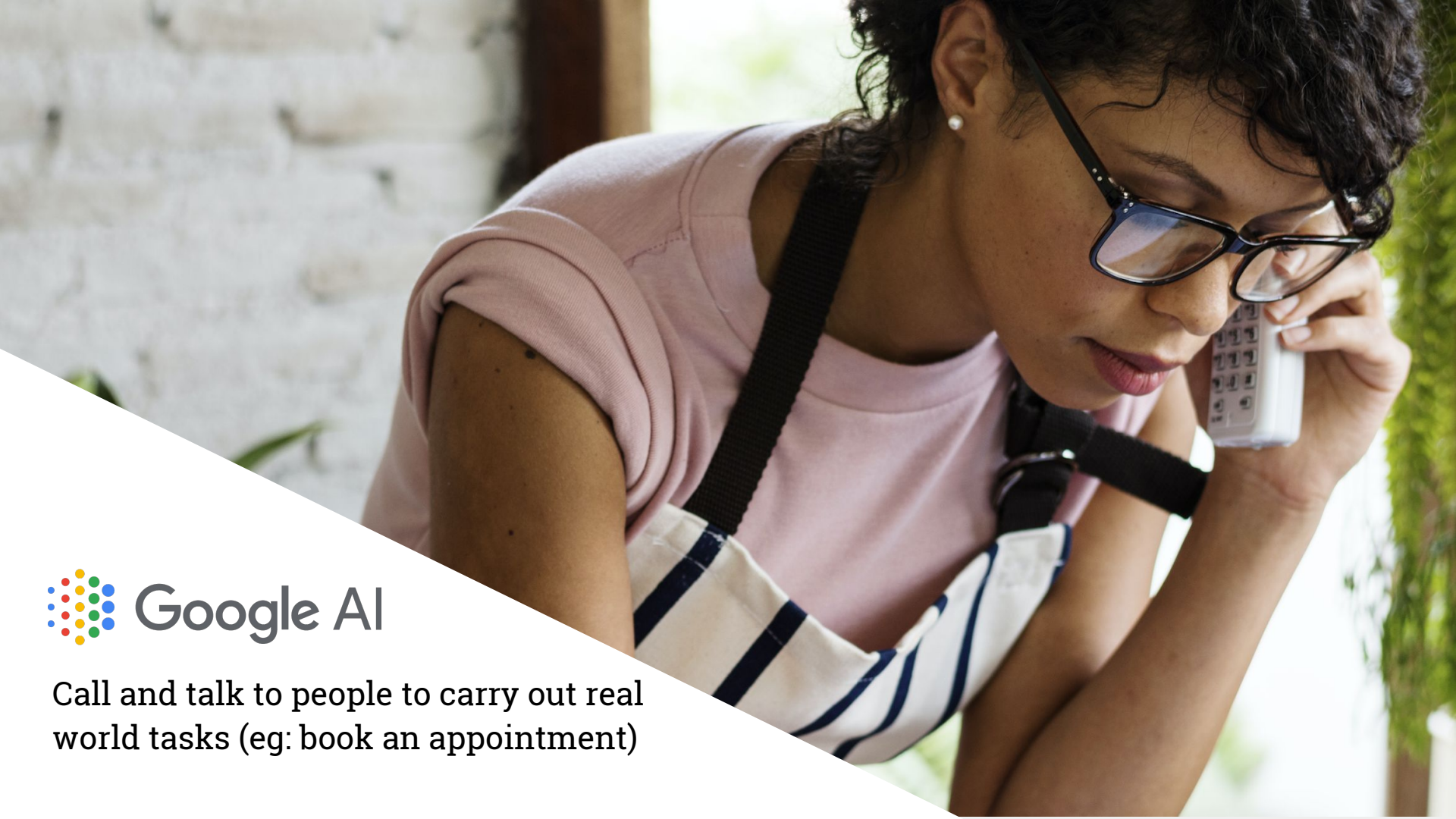
**create** something new



Google Translate

Real-time translation of text within  
images via Translate app





Call and talk to people to carry out real world tasks (eg: book an appointment)

## Session I (continued): Discussion with Session I Panelists

- ❖ **Moderator: Fred Cate**, Senior Policy Advisor, CIPL
- ❖ **Srinivasa Rao Aravilli**, Senior Engineering Manager – AI/ML Applications, Cisco
- ❖ **Daryl Arnold**, Chairman, DEX
- ❖ **Shane Witnov**, Privacy and Public Policy Manager, Facebook
- ❖ **Peter Fleischer**, Global Privacy Counsel, Google
- ❖ **Dr. Laura Wynter**, Head of RealWorld AI Group, IBM
- ❖ **Richard Koh**, Chief Technology Officer, Microsoft Singapore

# Challenges and Tensions Between AI Applications and Data Protection Principles

## Challenges associated with AI

•Fairness •Ethical Issues •Public Trust •Legal Compliance •Tensions

### Data Protection Requirements

Collection limitation / Data minimisation

Purpose specification & Use limitation

Legal basis for processing

Retention limitation

Transparency

Individual rights

Rules on ADM

### Tensions To Resolve

### Artificial Intelligence

Needs sufficient volumes of data for research, analysis, operation, training and to avoid bias

Uses data for new and unforeseen purposes beyond original scope

Insufficient/limited variety of legal bases may undermine full range of AI applications

Needs to retain for AI training, deployment and oversight

Operates in a black box and may produce unexplainable and unanticipated outcomes

Cannot always facilitate access, correction or explanation of the logic involved

Based on ADM & No human involvement



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Policy  
Leadership  
Hunton Andrews Kurth LLP

# Morning Session Recap

**Fred Cate**, Senior Policy Advisor, CIPL

# Introduction of PDPC Singapore's Proposed Model AI Governance Framework

**Lee Wan Sie**, Director, Strategy and Digital Economy & Data Innovation Programme Office,  
IMDA



## Session II: Accountable and Responsible AI in Practice

- ❖ **Moderator: Yeong Zee Kin**, Deputy Commissioner, PDPC
- ❖ **Florian Thoma**, Senior Director, Global Data Privacy, Accenture
- ❖ **Lam Chee Kin**, Managing Director and Head, Group Legal, Compliance & Secretariat, DBS
- ❖ **Arianne Jimenez**, Privacy and Public Policy Manager, Facebook
- ❖ **Dr. JJ Pan**, APAC Data Ethics Officer, LiveRamp
- ❖ **Derek Ho**, Senior Vice President, Assistant General Counsel, Privacy and Data Protection, Mastercard
- ❖ **Alejandro Mosquera**, Director and Assistant General Counsel, MUFG
- ❖ **Justin Weiss**, Head of Global Data Privacy, Naspers Group
- ❖ **Dahlia Mohd**, Director, Parrot Social
- ❖ **Michael Lamb**, Global Chief Privacy Officer, RELX

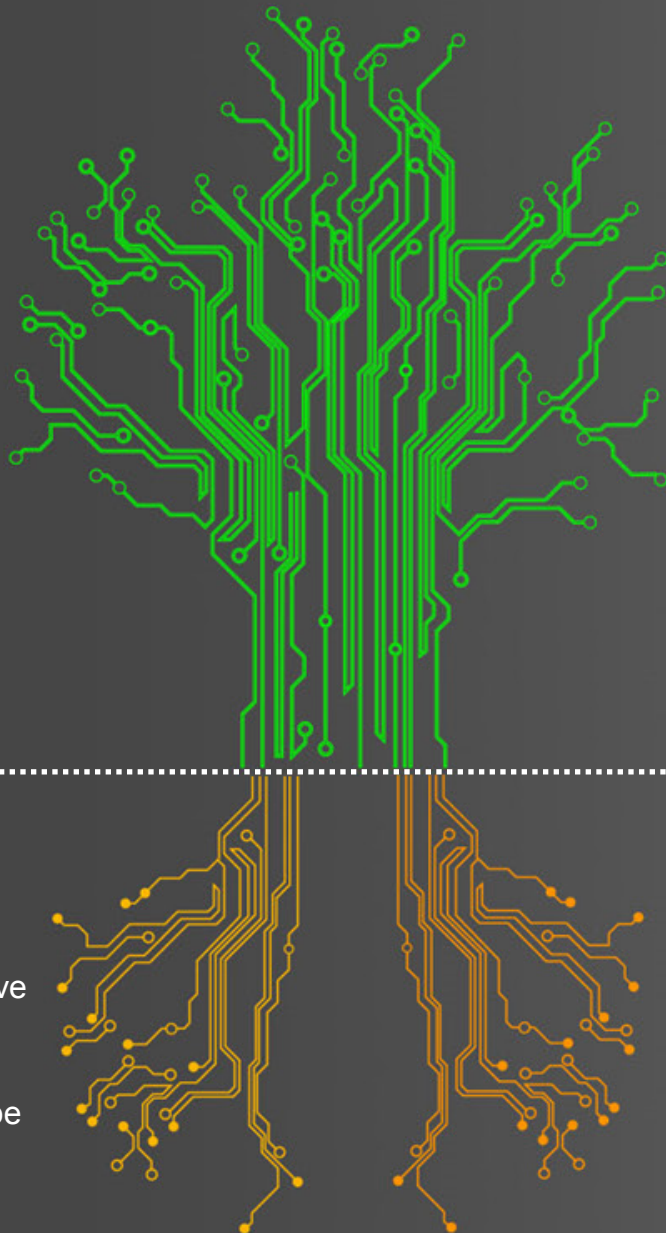
# ARTIFICIAL INTELLIGENCE AND PERSONAL DATA



**FLORIAN THOMA**

**PDPC – CIPL  
SINGAPORE  
NOV 16, 2018**

# AI RISKS AND CHALLENGES



## OPPORTUNITY TO UNLOCK TRAPPED VALUE

AI affords a tremendous opportunity not only to increase efficiencies and reduce costs, but has the capacity to help rethink businesses and solve critical problems.

## UNINTENDED CONSEQUENCES

Unexpected, but harmful, outcomes have led to consumer backlash and legal problems. Launching AI without an understanding of its social impact can be risky to your company's reputation and brand.

## COMPLIANCE, GOVERNANCE & SECURITY CHALLENGE

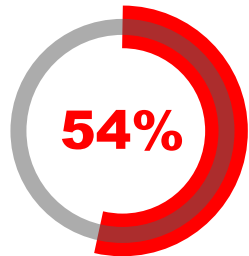
Deploying AI without anchoring to robust compliance and core values may expose businesses and individuals to significant risks including employment/HR, data privacy, health and safety issues. The potential fines and sanctions can be business threatening.



# ORGANIZATIONS AND PEOPLE ARE NOT READY FOR AI

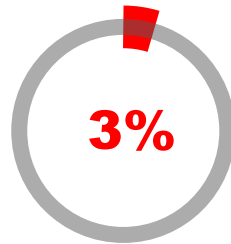
Companies must enable their organizations and people to be appropriately equipped and skilled to fully leverage the benefits of AI.

Talent with in-demand AI skills is limited



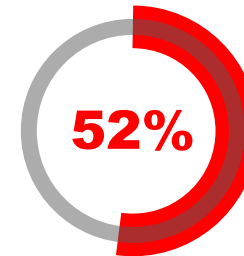
54% of CIOs cite **staffing AI skills as their #1 challenge** in adopting AI <sup>1</sup>

Companies are at risk by not investing in their workforces



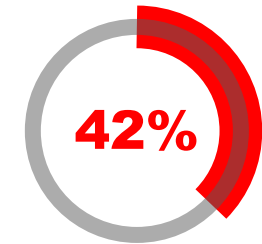
Only **3% of executives say they intend to significantly invest in training and reskilling** their workforce in the next three years <sup>2</sup>

AI requires a shift in leadership mindsets and behaviors



52% of CEOs are **fearful that leadership will have less transparency** into their business due to AI – and less control over outcomes <sup>3</sup>

Companies must act if they want to innovate in the future



**42% of executives believe intelligent technologies will be behind EVERY new innovation** they implement in the next three years <sup>2</sup>

<sup>1</sup> Gartner. Predicts 2018: Artificial Intelligence. [LINK](#).

<sup>2</sup> Accenture Davos. Reworking the Revolution. [LINK](#).

<sup>3</sup> Infosys. Leadership in the Age of AI. [LINK](#).

# DATA PROTECTION PRINCIPLES

**Established data protection principles are at odds with artificial intelligence realities**

## Principles

**Collection Limitation**  
**Purpose Specification**  
**Use Limitation**  
**Data Minimization**  
**Retention Limitation**  
**Data Quality**  
**Transparency**  
**Access and Correction**



## Challenges

- Data is #1 resource
- Should use ALL available data
- Unforeseen/unpredictable outcomes
- Small data (training) sets introduce bias
- Black Box issue
- Garbage In Garbage Out

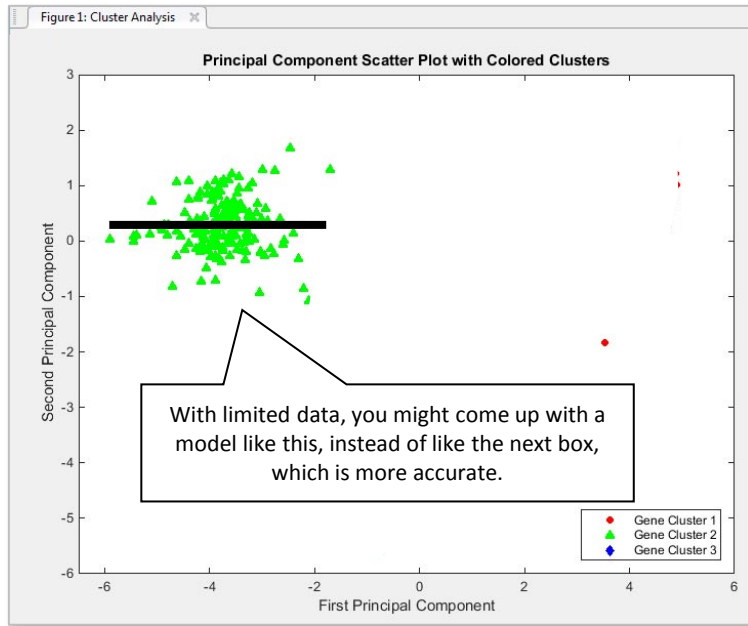
- **The AI debate should not be a data protection (regulatory) debate but be inclusive.**
- **It should not be based on the assumption of antagonism between controller and individual but needs the third dimension: societal benefit.**
- **Elements exist that help address the challenges; they need to be put into a systematic context.**



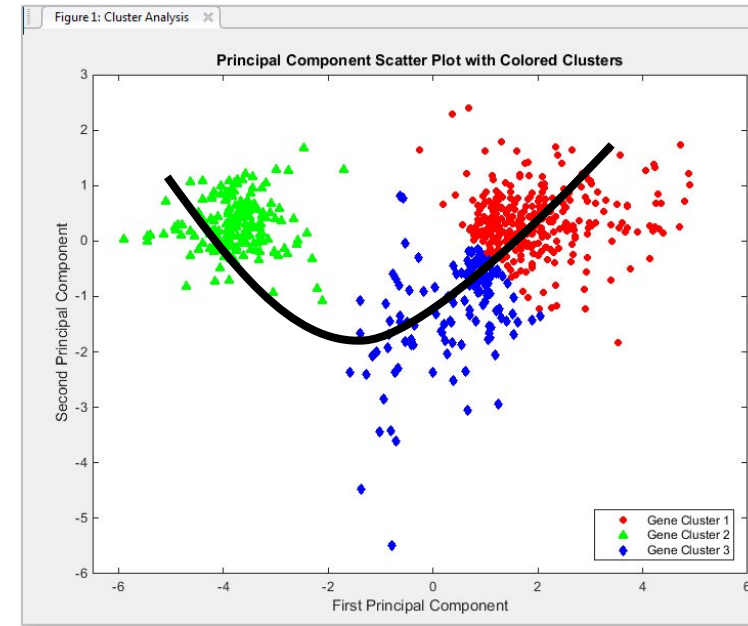
# The Bigger the Better: Why data sets are important.



Limited Data Set



Full Data Set



**Having a more limited view of the world means you're less likely to build a good model that can be "generalized" for new data.**

Source: Accenture analysis

# AS AI ACCELERATES, UNIQUE ETHICAL CONCERNS COME IN PLAY

AI IS PROGRESSING RAPIDLY, BUT THE TOPIC AROUND AI GOVERNANCE IS STILL IN ITS INFANCY WITH NO INDUSTRY CONSENSUS ON STANDARDS

## ETHICAL CONCERNS SUCH AS

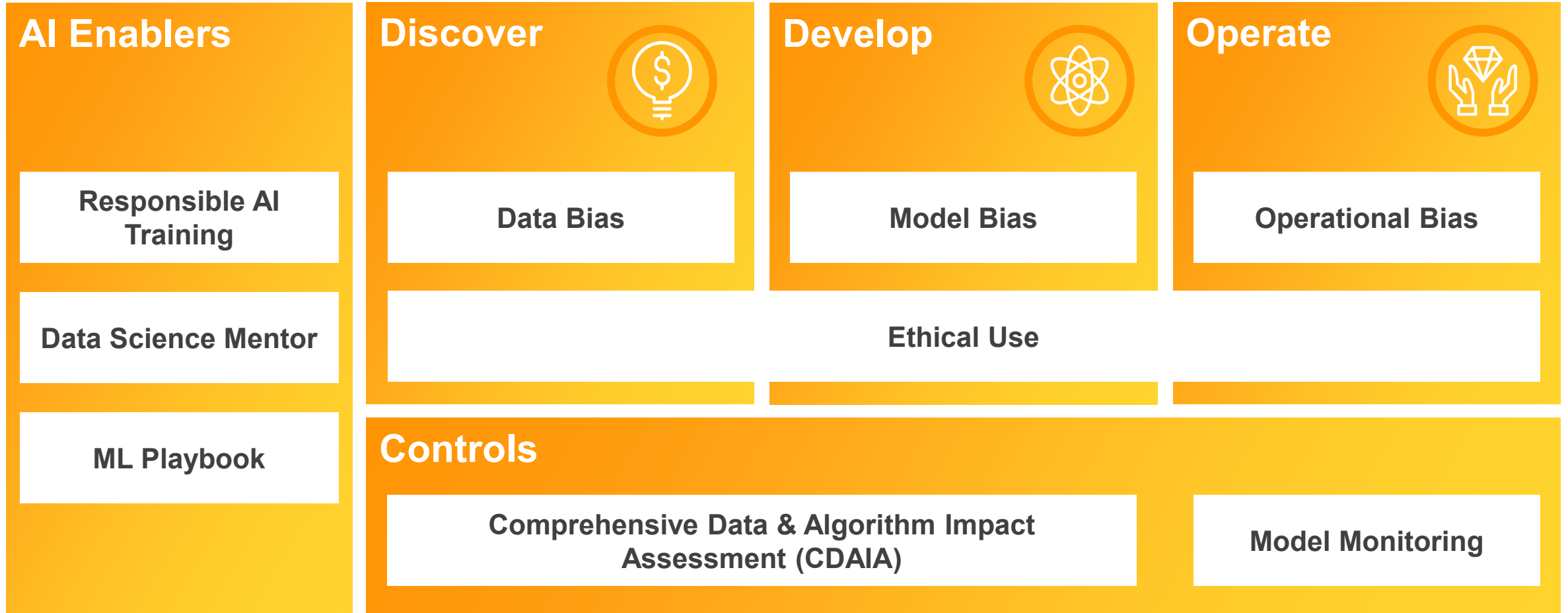
- **Job displacement** as a result of increased automation
- **Lack of transparency** and ability to understand how and why decisions were made and actions were taken (e.g. black box algorithms)
- **Bias and drift from desired state** are amplified when using AI, reaching far and fast
- **Lack of diversity** in how systems are developed (e.g. from talent and training data)
- **Data privacy** and entitlements on access to data

## ... IF UNADDRESSED, CAN LEAD TO SEVERE **IMPACTS**



- Poor AI performance causing limited to not value from the investment made
- Regulatory implications resulting in inability to use existing AI solutions
- Employee resistance to AI affecting adoption rates
- Set of embarrassing PR incidents affecting the corporate brand
- Bad publicity putting company survival at risk
- Unintentionally breaking the law, fines and settlements, and legal actions

# GOVERNANCE TOOLKIT: RESPONSIBLE AI GOVERNANCE FRAMEWORK



# COMPREHENSIVE DATA IMPACT ASSESSMENT

The CDIA is an enhancement to the current PIA process to evaluate impacts of data and models throughout the model development process.

## Privacy Impact Assessment

PIA is completed for all projects/ initiatives to identify privacy and ethical risk of data use. This is an existing process and would continue within the AI governance

Considerations:

### Privacy

- Ensure that personal information or data will be effectively managed and protected, and the appropriate governance and accountability structure will be in place to ensure that our customers trust and confidence are maintained at all times

### Ethics

- Determine whether the proposed use case aligns with company ethical standards and customer/team member expectations.

## Data Impact Assessment

DIA is completed when projects use customer data in order to determine data usage guidelines. Questions which address different forms of bias related to AI would augment the current DIA.

Considerations:

### Data Bias

- Identify areas of experimental or societal bias within the data

### Data sensitivity

- Determine whether data use laws apply and how
- Define purpose and usage parameters for the data
- Consider customer expectations around data use

## Algorithmic Impact Assessment

AIA is completed for AI use cases where a model is able to make decisions based on data. The AIA would be a net new piece of governance specific to AI.

Considerations:

### Model Bias

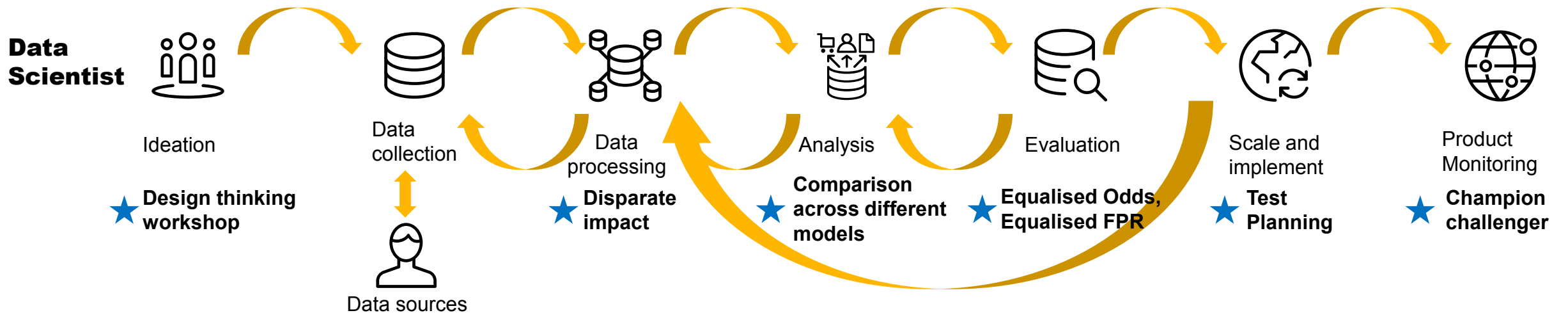
- Score risk profile of the model
- Assess areas for bias in model choice and assumptions

### Model Explainability/Transparency

- Understand level of interpretability of the model.
- Identify areas of the model development can and should be shared with the customer.

# TECHNICAL TOOLKIT: INTEGRATING FAIRNESS ASSESSMENTS IN THE DATA SCIENCE WORKFLOW

As part of a Turing Institute Data Study Group, Accenture has prototyped an easy-to-deploy **algorithmic fairness tool** based on the definition of **fairness as equal impact across groups**.





# LiveRamp Operationalizes Data Ethics

By Dr.JJ Pan

APAC Data Ethics Officer &  
Director of Public Policy

2018/11/16



# Operationalize Global Data Ethics: Governance, Protection, Privacy

(5 Elements Of Frameworks- Organizational Commitments, Mechanism Implementing Policies, System to Govern, Individual Control and Necessary Remedies)

Information Governance	Data protection
External Engagement	<ul style="list-style-type: none"><li>•Policy Groups</li><li>•Legislative and Regulatory Groups</li><li>•Special Engagements</li></ul>
Internal Data Governance	<ul style="list-style-type: none"><li>•Policy Development</li><li>•Message Control, Media</li><li>•Data Source Due Diligence</li><li>•Privacy Impact Assessment</li><li>•Credentialing</li></ul>
Client and Partner Support	<ul style="list-style-type: none"><li>•Strategic and Tactical Support</li><li>•Deal Facilitation</li><li>•Ethical Data Use Expertise</li><li>•Contextual Ethical Interrogation</li><li>•Problem Solving, Points of View, Future Preparedness (feeds innovation cycle)</li><li>•Navigate Legal Probability vs Certainty</li></ul>



## 360° Approach: Speed, Agility, Scale

1. Operationalizes data governance nearly 50 years ago.
2. Hire 1st Chief Privacy Officer.
3. Safe Haven data architecture as a compliant data matching platform.
4. 1st consumer portal aboutthedata.com
5. 1st blockchain-based protocol "Privacy Chain" allowing companies to track consent users' personal data with IAB



# Assure Data Ethics Among Data Flow

Data  
Source

《Data Source Certification Review》

Data Ethics By  
Design

《Interrogate Data Ethics In Product Engineering 》

Data Ethics Impact  
Assessment

《Governing Ethic Data Use With Security &  
Business Stakeholders》

 LiveRamp | Thank You



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## Session II (continued): Discussion Among All Workshop Participants

**Moderator: Bojana Bellamy, President, CIPL**

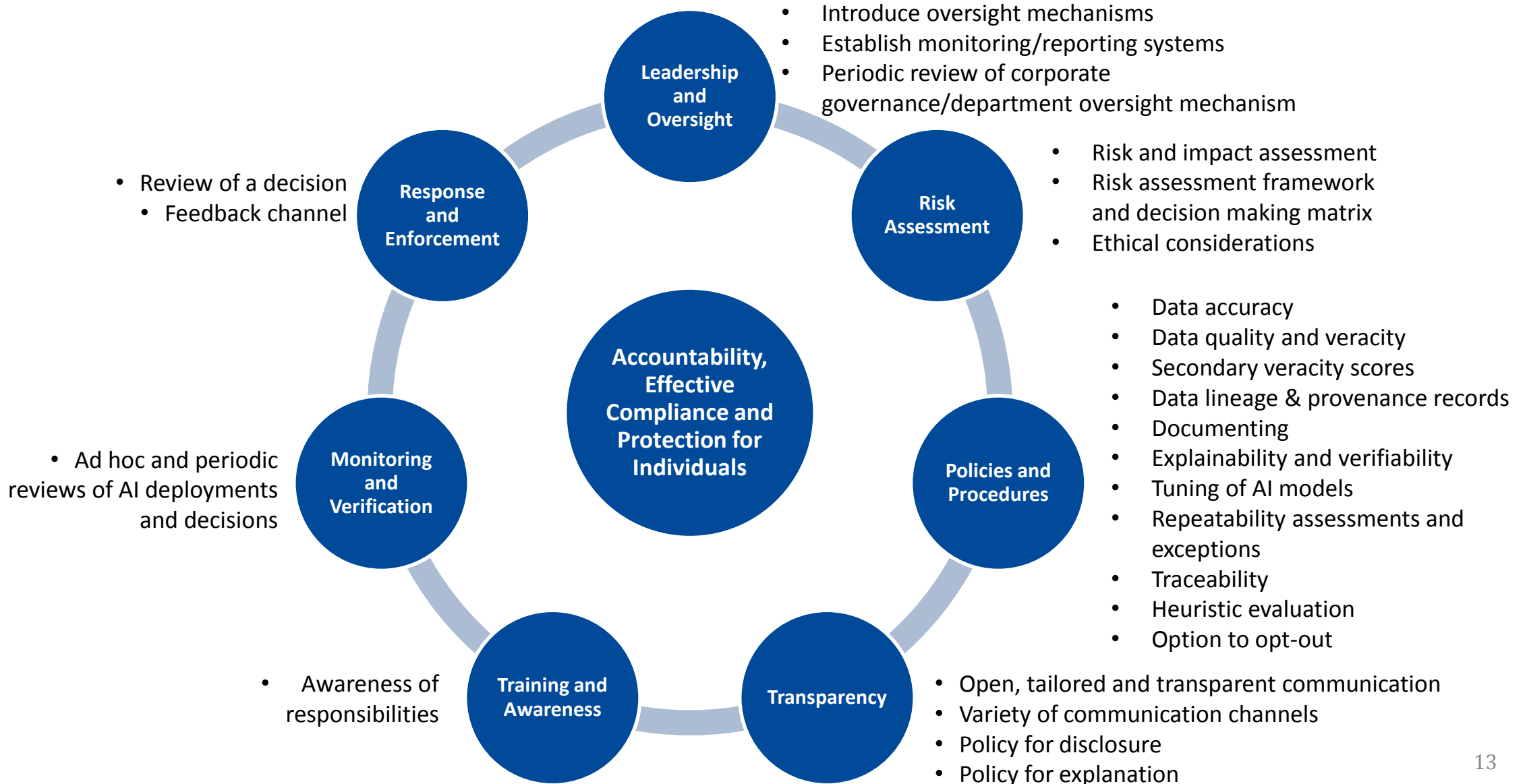


# Universal Elements of Accountability



# What Does an Accountable AI Governance Model Look Like?

## C IPL Accountability Wheel + PDPC AI Governance Framework =





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# Closing Remarks

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**Yeong Zee Kin**, Deputy Commissioner, PDPC

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