Rethinking the detection of child abuse on the Internet

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with the help of MANY collaborators
at NCMEC, Thorn and Google

WARNING

Potentially triggering language
and difficult subject ahead

Online child sexual abuse

The production, distribution, and consumption of digital child sexual abuse material (CSAM)

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The online child sexual abuse ecosystem has transformed alongside technological shifts

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Child abusers take advantage of key technological shifts

Camera phones
easier to produce

Rich media
content diversification

Online community
easier to organize

Digital distribution
easier to share

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We identified 5 key challenges through a multi-year data driven study

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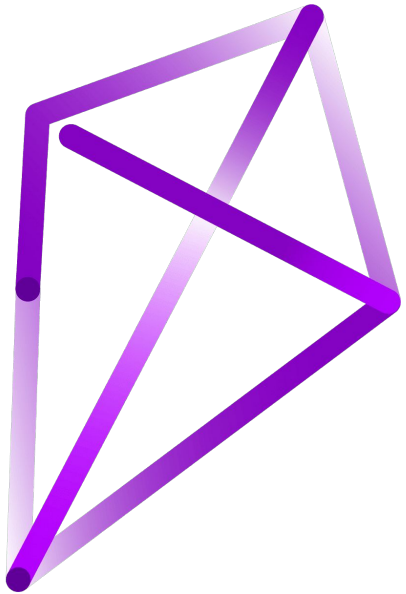
To appear at WWW 2018

Let’s build technologies to create an Internet free of child abuse



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NCMEC is the US clearinghouse for child abuse reports

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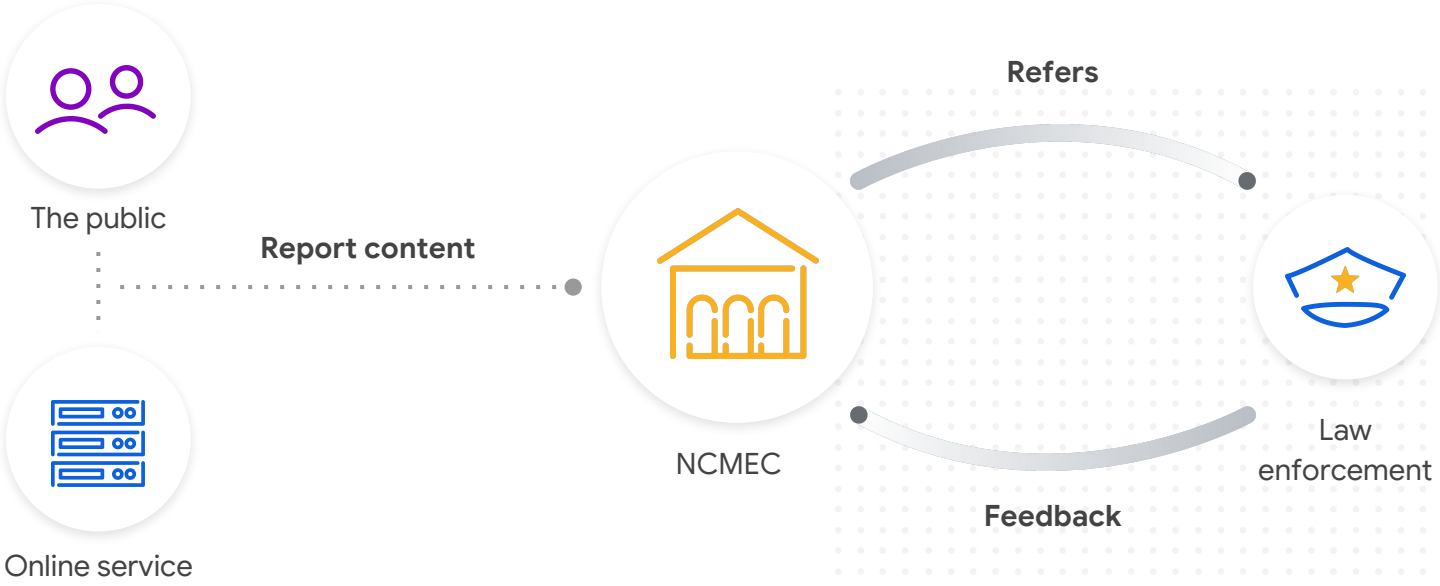
Life of a CSAM report



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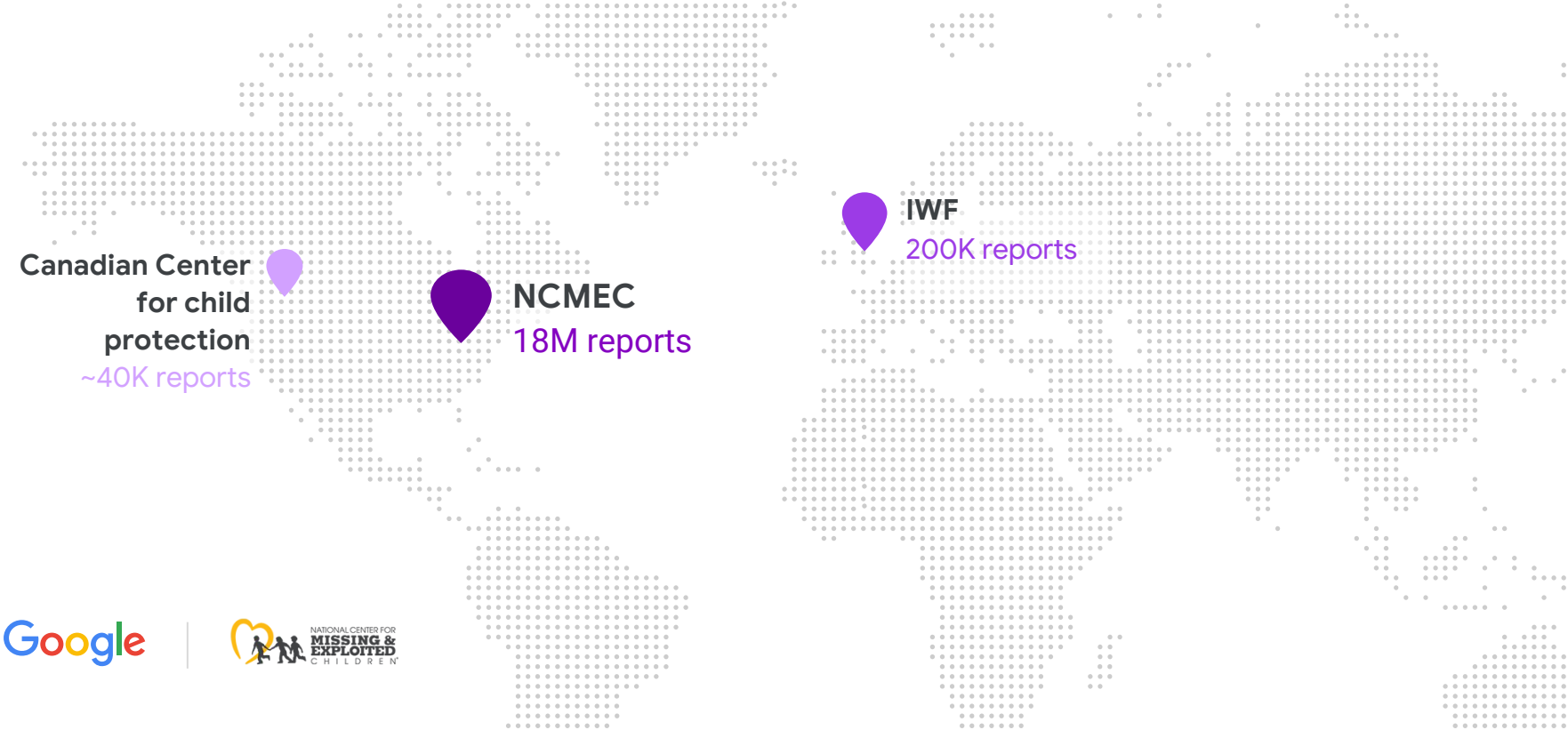
Some of the world's clearinghouses



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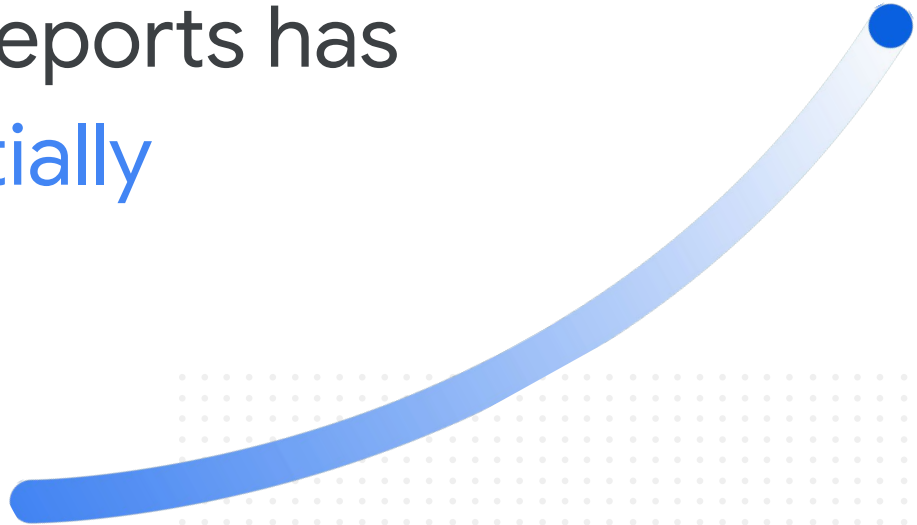
1

The number of reports has grown exponentially



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1998

3,000
reports

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1998

3,000
reports

2018

18,400,000 / 6000x
reports

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Content-based report prioritization to focus on the most actionable ones first

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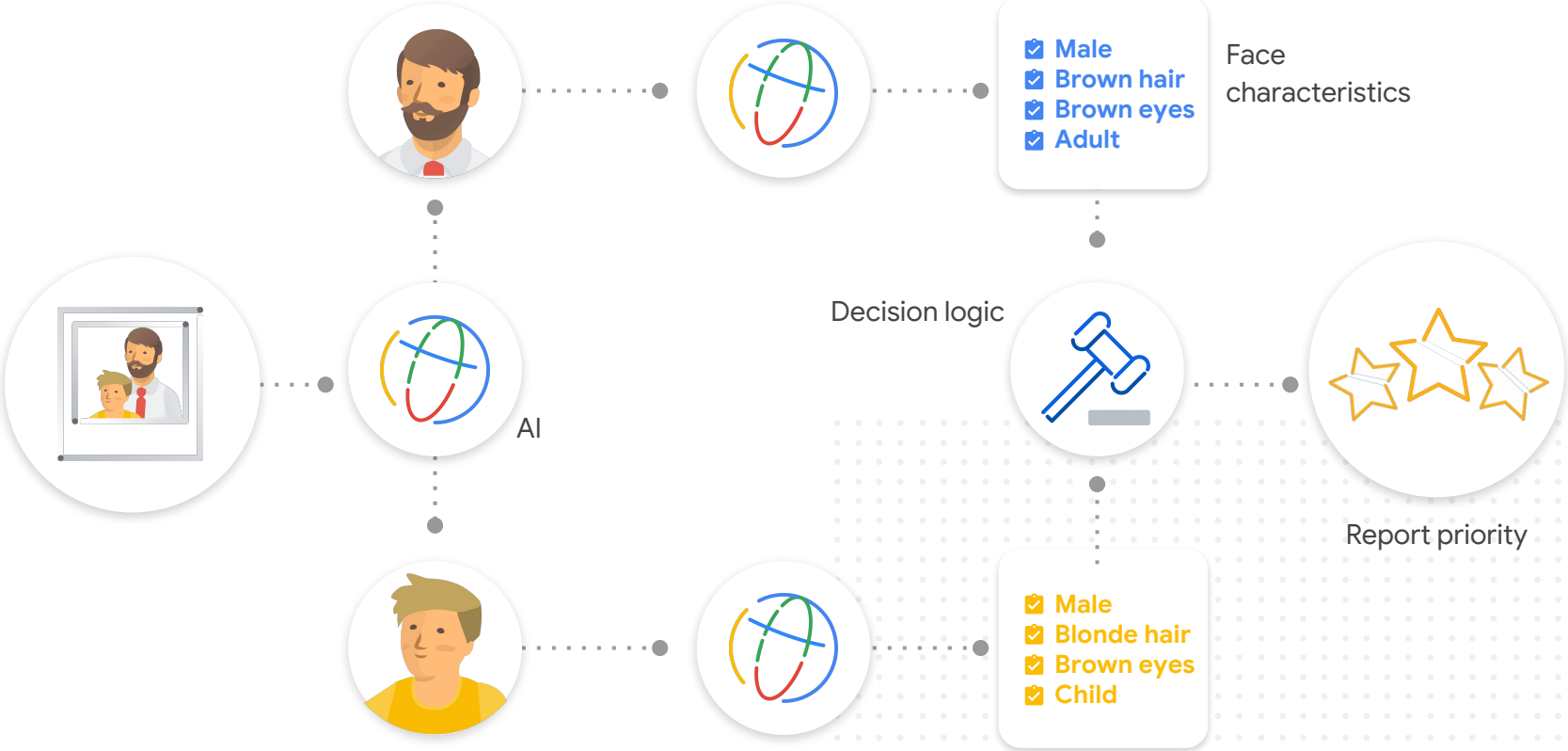

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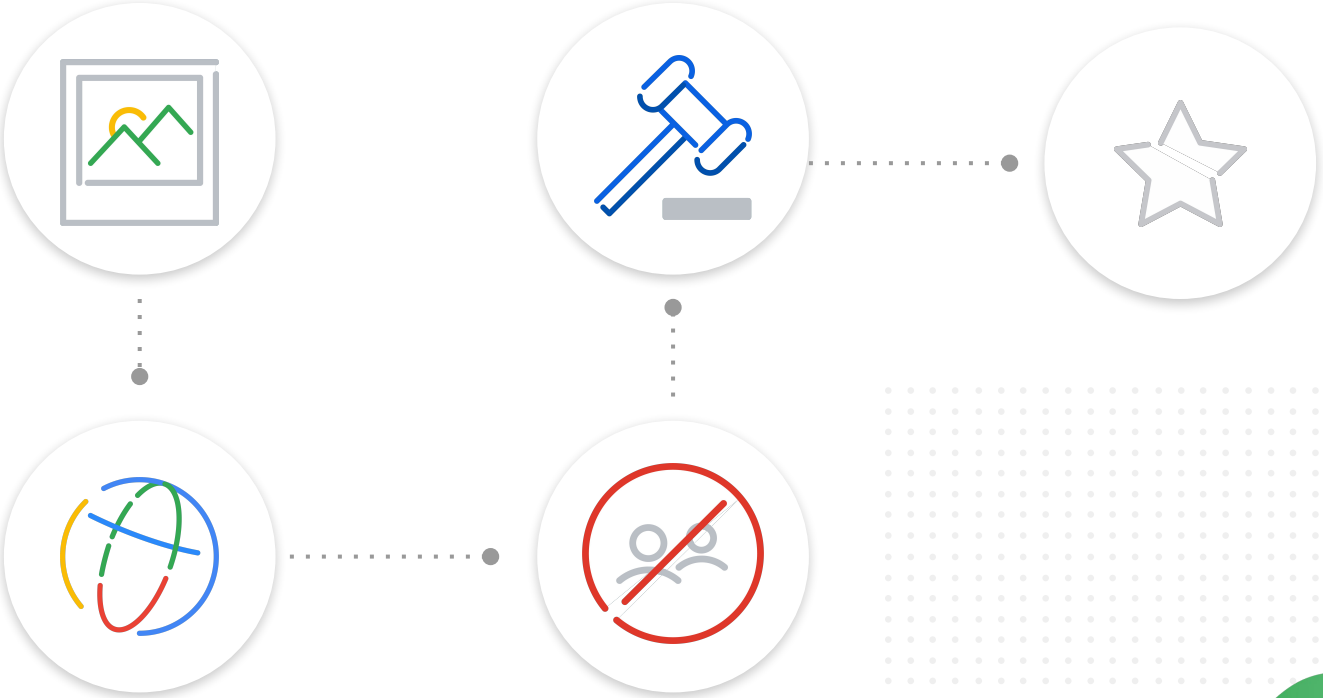

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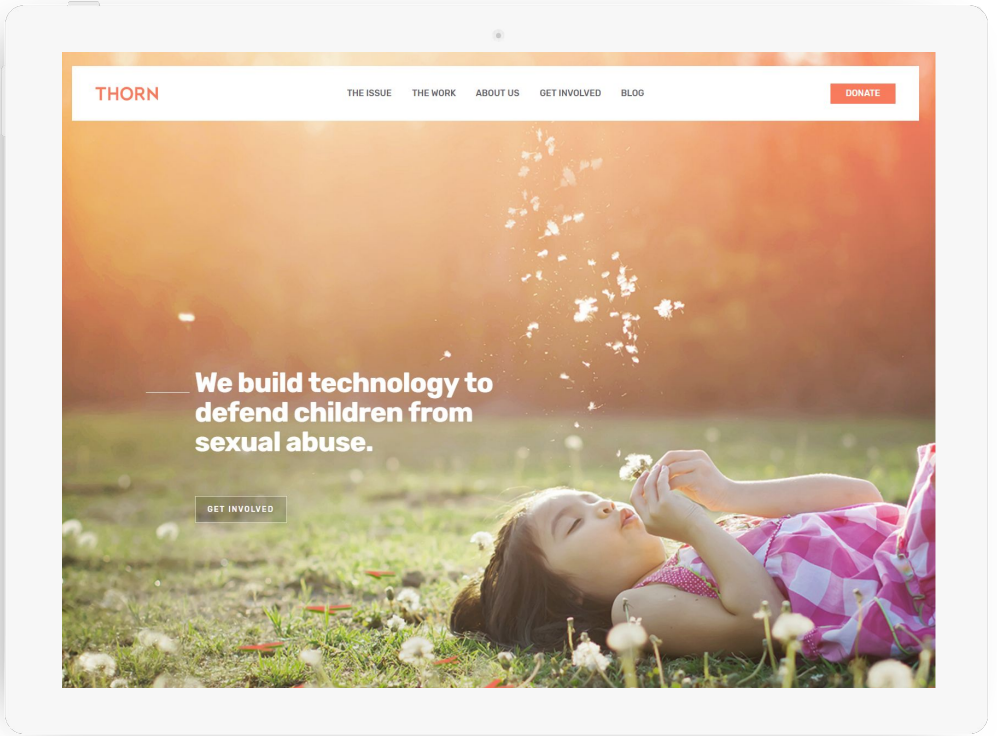
Open-source

Tensorflow based system available through Thorn



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An informative image

gender	male	97.3%
age group	young adult	86.3%
hair	black	72.1%
head cover	cap	62.1%

gender	female	78.3%
age group	young adult	63.3%
hair	black	87.1%
head cover	none	97.7%

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A less informative image

gender	male	100%
age group	young adult	92.3%
hair	unknown	74.4%
head cover	cap	97.7%
facial hair	beard	60.7%
eyewear	sunglasses	78.4%

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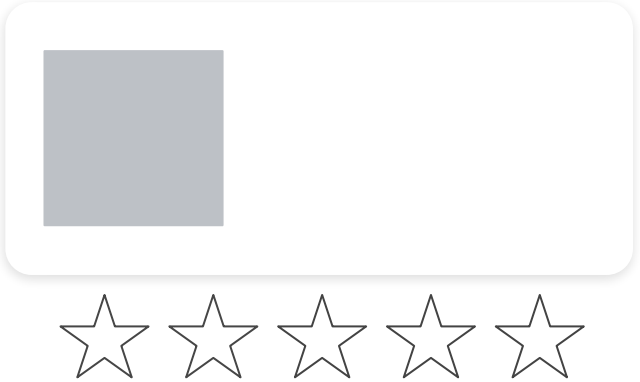
A non informative image



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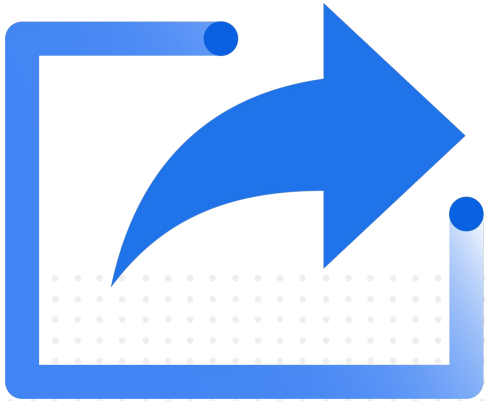
2

Most content is only shared once



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Key media types

84%

Images reported once

91%

Videos reported once

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content very long tail makes traditional hash blacklists ineffective

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Content aware detection

to ensure new content is quickly identified and reported

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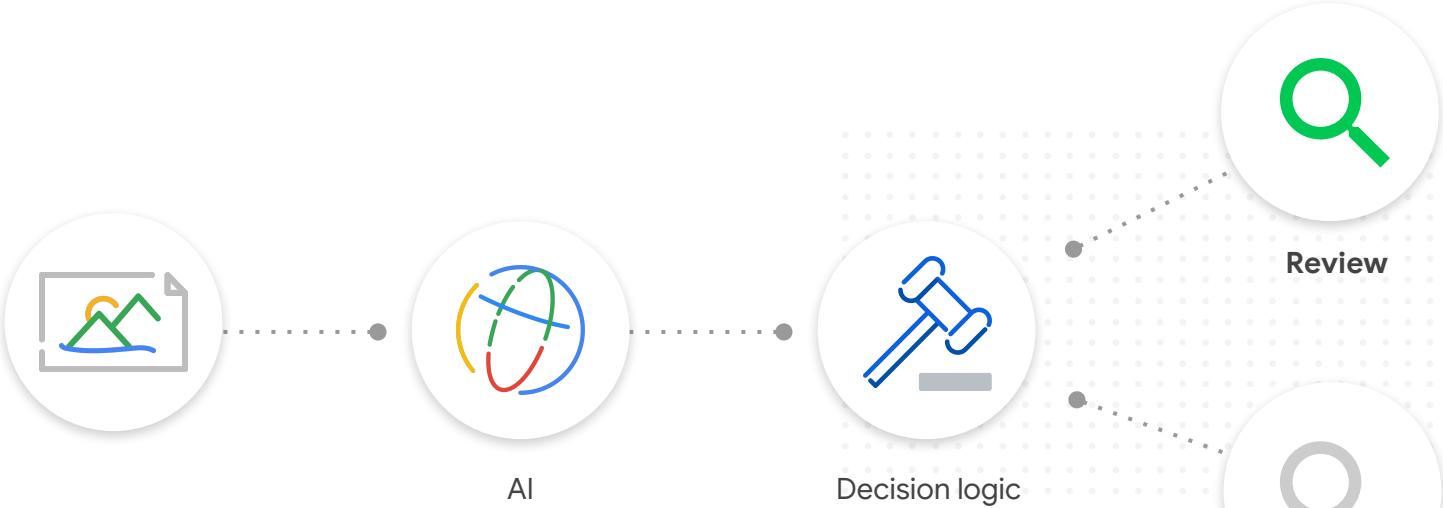
Prioritization API



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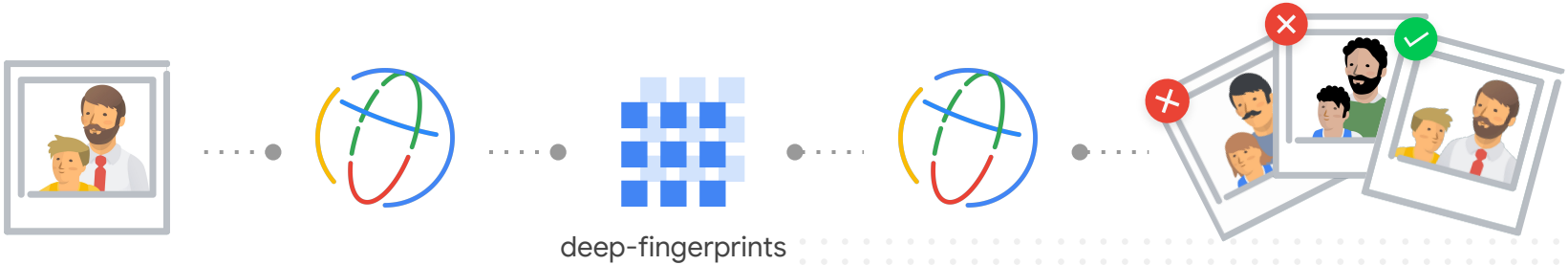
https://www.blog.google/technology/safety-security/continuing-fight-against-child-sexual-abuse-online/

Highly experimental

Toward applying AI to related images detection



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3

Media types are rapidly diversifying

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Video is the fastest growing medium

2016

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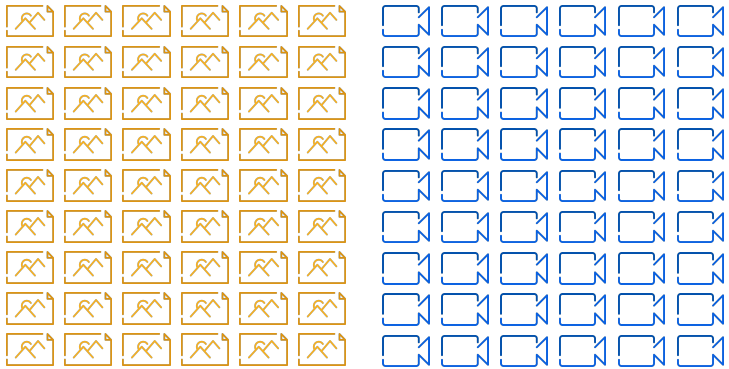
Video is the fastest growing medium

2016

2018



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Reliable detection across all media to keep pace with medium diversification

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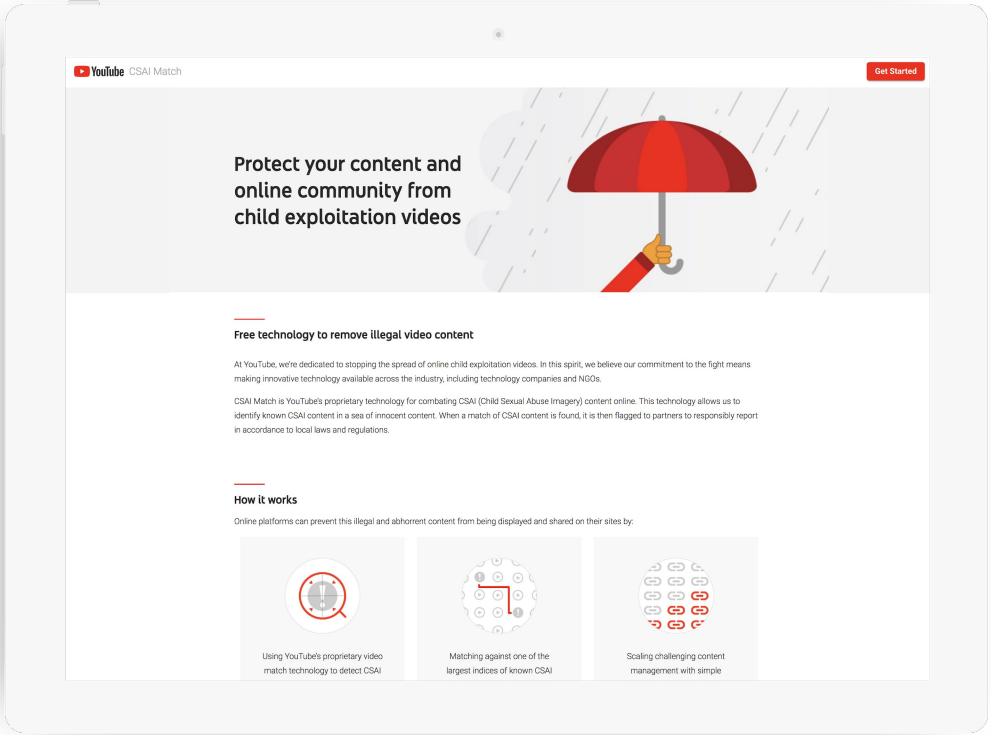
YouTube video fingerprint



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Child abuse cross borders

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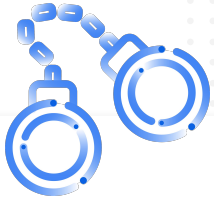
PlayPen dark web forum takedown

150,000
Forum users from around the world



548
International arrests

296
Abused children rescued

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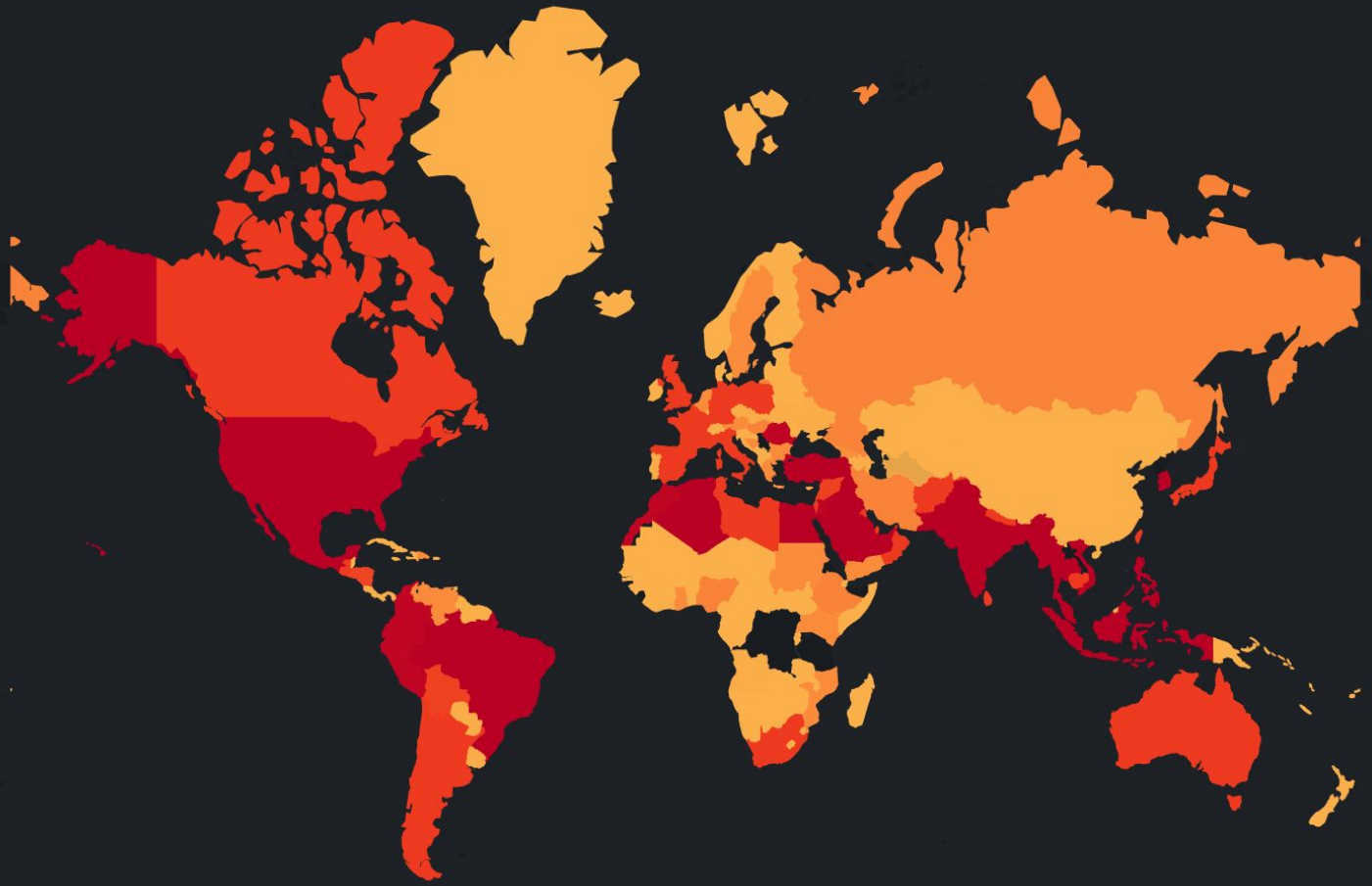
https://www.fbi.gov/news/stories/playpen-creator-sentenced-to-30-years



Streamline collaboration

to increase efficiency and improve transparency

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The emotional toll of manual review

Manual reviews are needed to check the validity of the reports and find potential clues that can help rescue childrens

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Reduce negative emotional impact via AI based image transformations

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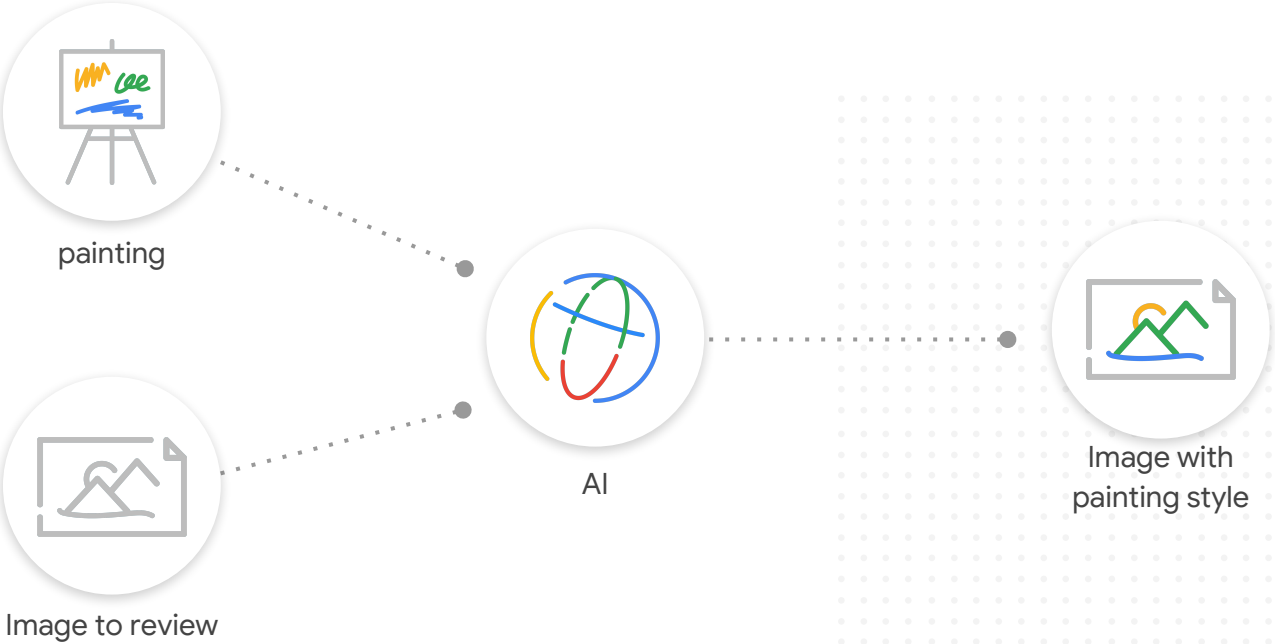
Style transfer explained



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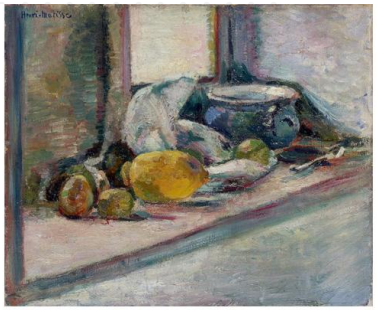
original image

+



style reference

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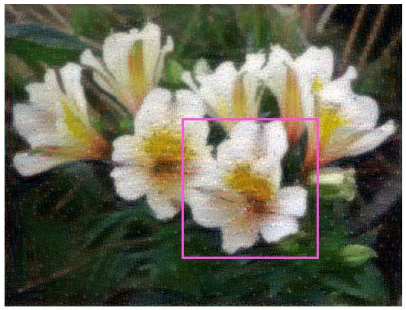

stylized image

Artistic style transfer preserve image semantic while changing its appearance

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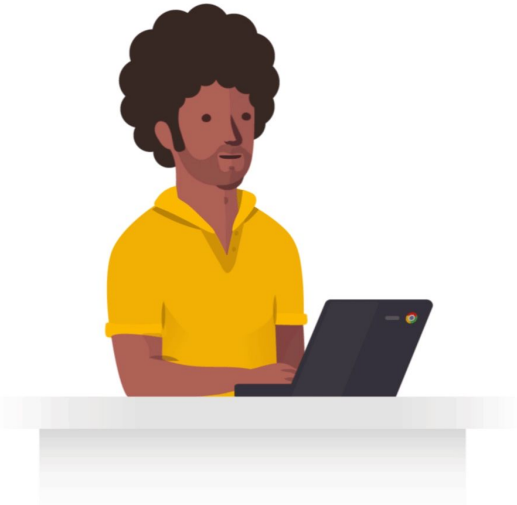
Highly experimental



Reduce
negative emotion by 16%
on explicit and violent
images

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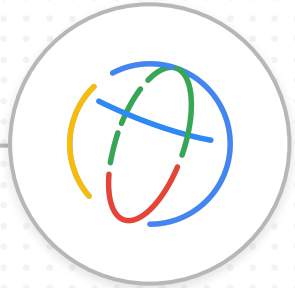
Initial work under submission

Takeaway

Technological shifts weaponization

Explosion of child sexual abuse content



Build transformative technologies to curb online child abuse

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Questions?

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Let’s build together the technologies needed to make the Internet free of child abuse

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contact: @elie / elieb@google.com