

Johann Hofmann explains how artificial intelligence is evolving to fight the growing scourge of online child sexual abuse.

Empowering CSA investigators

Child sexual abuse (CSA) is a horrific crime which sadly has occurred in cultures for thousands of years, but the advent of the internet and its associated technologies has allowed it to explode into a more widespread issue than ever before.

High-quality recording tools, streaming services, social media networks, the cloud and, of course, the dark web all enable the heinous criminals associated with CSA to produce, share and consume this horrific content at a massive scale – and easily do so anonymously. Furthermore, the technology that enables criminals to perform these crimes is getting more advanced every day, making it very challenging for law enforcement and their relevant toolsets to keep up.

However, new technology has emerged over the past decade that is empowering CSA investigators to automate the more manual elements of their work, enabling them to work more efficiently.

Artificial intelligence (AI) is an important element of this, now giving investigators the ability to automatically detect, label and sort content to cut backlogs, reduce exposure and stress on the investigator and ultimately identify and rescue victims faster.

In this article I will give an overview of the growing online CSA crisis, including how it has been exacerbated by the Covid-19 lockdown.

I will then detail the challenges police face when investigating these crimes because of the sheer volume of explicit content they have to analyse.

Finally, I will introduce the technologies that are developing to help law enforcement fight CSA crimes more efficiently.

Growing online crisis

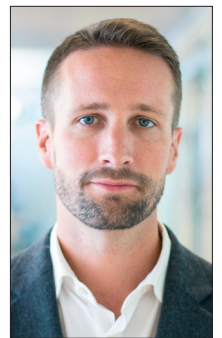
According to the UK's Internet Watch Foundation (IWF), reports of CSA are increasing significantly year on year. In 2018, it processed 229,328 reports of CSA and in 2019 that number shot up 14 per cent to 260,400. Of these reports, 132,700 pertained to web pages featuring CSA material, equating to millions of images and videos – this figure is a 26 per cent increase on what it was in 2018.

These findings relate to just one of the hundreds of organisations globally that have teams dedicated to fighting CSA crimes. For example, the US National Centre for Missing and Exploited Children (NCMEC) received 16.9 million reports of child sexual exploitation in 2019.

This dramatic year-on-year increase in both reports of these crimes and the volume of criminal content being produced, is most likely occurring because technology is making it easier than ever to produce, share and consume this content online, completely anonymously.

To go into more depth, streaming services make it easier to share high-quality videos; social media networks give criminals a platform to groom children into producing content and also can act as a medium for sharing content with other criminals; the cloud allows criminals to store content securely and anonymously; and the dark web acts as the anonymous epicentre of CSA crime online.

This was, and has been for decades, a pressing problem. However, reports have showcased that, most likely because people are at home with their devices more, and may be alone or out of work, CSA reports have increased even more dramatically during the coronavirus lockdowns around the world.



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For example, the NCMEC received 4.1 million reports of children being abused online in April 2020, in comparison to four times less – one million – in April 2019. As of the May 20, 2020, the IWF had also reportedly blocked and filtered at least 8.8 million attempts by UK internet users to access CSA content during lockdown.

Impossible workload

CSA investigators globally have been tirelessly fighting these crimes for as long as they have existed online, but as the volume of content to analyse and filter through per case has increased, law enforcement has experienced the massive strain of evidence taking longer to work through, while knowing that children are being abused and can only be saved via them solving the case.

Cases today can contain millions of images and videos, with videos making up the highest proportion of data. Until recently, investigators have had to work through this content largely manually, picking out content relevant to the case from an incredibly graphic and disturbing haystack.

This creates a massive mental strain on investigators, not because it is a time-intensive process, but also because the content itself is so harrowing and officers have to go past images of children who they know most likely will not be saved through the particular case they are working on.

An added frustration is that many departments work in silos to other local departments. This is mainly not out of choice but because forces lack the processes and technology that allow them to collaborate seamlessly. This means an officer in one force could be working through content that another force has already processed. A notable exception is the UK's Child Abuse Image Database (CAID), which has dramatically improved the efficiency with which police can solve these crimes by enabling officers around the UK to collaborate on CSA cases.

There is also the US-based Project VIC, which enables global information sharing via the cloud, and Interpol's ICSE (International Child Exploitation) database, which enables global victim identification between member countries.

The issues associated with Covid-19 that I raised earlier pose an additional challenge to law enforcement. Anecdotally, we have spoken with some law enforcement agencies that have implemented new routines, such as working from home, which, as with all industries, has impacted how they work.

Some agencies are also rotating staff from being at the office and working from home to impose social distancing. Depending on systems in place,

“This technology has been game-changing in the fight against the rapidly growing CSA problem”

this could mean that cases containing contraband material are analysed at a reduced rate. This, combined with an increase in content, will be generating a dangerous backlog, which will no doubt create a delay in cases being solved as investigators have to rush to analyse a huge mountain of evidence.

Impact of AI on investigations

As this article has argued, technological innovation has enabled online CSA to explode in volume, but it has also developed tools that allow investigators to do their jobs more efficiently and intuitively.

The implementation of AI is making a massive impact as, combined with biometric technology, these new solutions can automate portions of the manual aspect of CSA investigations.

For example, Griffeye Brain, which utilises these technologies, can pick out first generation material including new victims, and, if using a system like CAID, identify if these children or images correlate to imagery in previous cases, meaning officers can collaborate with colleagues in other departments to solve cases faster. It can also help identify content relevant to a specific case in images and, as of this month, in videos as well. Technology platforms like Griffeye's can also integrate this with other technologies, for example, software provided by UK company CameraForensics that correlates 'hidden' data with open source information to identify critical links between information.

The automation of these tasks means officers can prioritise analysis and investigative work such as victim identification, enabling them to solve crimes faster and safeguard victims sooner. It also means they do not have to be exposed to as much traumatising content on a daily basis.

This technology's value is more apparent than ever in the face of the Covid-19, based on the assumption that in some cases backlogs may be growing due to the impact of the pandemic.

On a somewhat positive note, many forces are using at least an element of AI to work through cases already so there is no doubt that it will make an impact in solving new investigations; saving children's lives as quickly as possible.

As a final comment, the development of this technology has been game-changing in the fight against the rapidly growing CSA problem, but criminals are always looking for new, innovative ways to perform these horrific crimes. It is crucial that law enforcement, and the technology firms that build the tools, work together to innovate at the same pace to stay ahead of the criminals and make the internet a safer place.