The digital era has revolutionized our lives, but it also fueled an unprecedented surge in the online sexual abuse of children.

**Growth of enabling technologies**

- **Rise of global internet access**
  From 51% of world population in 2005 to >80% in 2018
- **Rise of the Dark Web**
  Twice as many users of dark web browsers since 2012, reaching 2.5M today
- **Proliferation in use of website, chatrooms, applications**
  9x more websites since 2008

**Internet use**

- **Increase in use of peer-to-peer networks & file sharing**
  28M peer-to-peer network users in 2017
- **Worldwide prevalence of social media & messaging apps**
  3.5B active social media users
- **Live video streaming**
  18% of Snapchat users are minors

**Sharing platforms**

- **Rise of mobile phones**
  28% increase since 2008, adding up to >4.8B users today
- **Prevalence of cloud-based storage & digital distribution**
  Avg. person uses 36 cloud-based services every day
- **Prevalence of encryption**
  >50% of internet traffic is encrypted

**Devices & Features**

**Exponential growth in the volume of child pornography circulated online**

- **1998**
  3,000 reports
- **2018**
  18,400,000 reports

**Global sex trafficking epidemic shifting to younger children and new forms of abuse**

- 68% of websites showing 0-2 year-olds involve worst forms of abuse
- 1 in 4 victims of sextortion are 12 or younger

**Global online communities of perpetrators are growing**

- 150,000 forum users from around the world
- 548 international arrests
- 296 abused children rescued
The scale, variety and severity of online child sexual abuse challenges prevention, detection and prosecution efforts

Parents, caregivers and policymakers are often unable to keep children safe online

• Children **share more compromising images online**, as they gain a sophisticated understanding of the internet
• Parents, caregivers and policymakers often have **more rudimentary digital skills** and lack a basic awareness of the risks their children are exposed to

Internet and technology companies are often unable to detect online sexual abuse of children

• **Growing volume of abusive activity** across the web makes it challenging to identify child sexual abuse material and even more so victims and perpetrators
• Image hosting sites and social media sites **continue to proliferate**, making it increasingly difficult to spot and remove abusive content at its source

Law enforcement and NGOs often face challenges in prosecuting perpetrators

• Human analysts are **not able to process the massive volumes of data** involved in an average global sex trafficking case
• A **lack of resources and technical capacity** to process the volumes of data lead to significant backlogs of potentially criminal material
AI technology used today builds on basic analytics, web and device technologies. **Computer vision, natural language processing and predictive AI** can play a key role in combatting online CSAM, sex trafficking and emerging forms of digital abuse.

AI is uniquely positioned to address this problem; the solutions, which are in pilot stage, are showing enormous potential.
Current solutions rely heavily on basic analytics and humans, leaving significant potential to shift to AI-based tools.

- **Protect children from vulnerable behavior online** through predictive parental software filtering abusive content
- Proactively **stop online grooming** attempts through chatbots that mimic human conversations with potential perpetrators
- **Deter perpetrators search** processes through natural language understanding in search filters
- **Flag CSAM** for human review using automated image-based tools
- Detect **signs of abuse** through data mining of large datasets of text and images
- **Identify specific individuals or locations** through speech recognition and voice analytics
- **Collect additional information** on traffickers by datamining signals from images, metadata and text communications
- **Increase speed** of investigation through tools that visualize and simplify trends and patterns

Our mapping of 50+ global technology solutions provides a snapshot of the major players and current tools used to **prevent, detect and prosecute** child sexual abuse.
AI has tremendous potential to upgrade analytics tools, expand focus beyond detection and assist in prosecution efforts

**Prevent & Safeguard**

- **Next generation network analytics and on-device AI**
  - Advanced network analysis using deep learning can flag suspicious accounts and prevent grooming attempts on child-friendly platforms (social media, games)
  - On-device, operating system-based AI, pre-installed with parent consent, can prevent children from engaging with perpetrators, uploading images, sexting, etc.
  - Deterrence tools can interfere in all attempts of searching for CSAM by engaging the (potential) perpetrator actively in a real-time conversation to collect evidence for law enforcement and prevent abuse
  - Network analysis can help identify and remove ads that are likely to contain trafficking

**Detect & Disrupt**

- Bridging image and text-based AI and tools
  - Context-rich image classifiers for automated detection of non-encrypted CSAM can enable efficient detection without need for human reviewers
  - Automatic, flagging of CSAM on relevant platforms “at its source” can help remove material before it is circulated
  - Data-rich pattern recognition and natural language processing can triangulate multiple data sources and remove ads that are likely to contain trafficking
  - Proactive crawling of dark web, combined with natural language processing and text analysis, can find CSAM repositories
  - Real-time capabilities can help detect and cut out live-streamed abuse
  - Advanced identification technologies using voice and other biometric footprints can help identify victims and perpetrators

**Investigate & Prosecute**

- New generation of investigative tools that can predict and prioritize
  - Advanced network analysis technology can trace perpetrators to physical location to arrest them, as well as to detect and prioritize top of the pyramid perpetrators
  - AI-powered digital forensic tools can help gather evidence
Full participation and efforts from stakeholders is required TODAY to bring the full strength of AI technology to the fight

1. Share existing **knowledge** and increase collaboration among stakeholders
2. Establish **new forms of collaboration** across sectors and across borders
3. Redefine **legal frameworks** enabling secure use and sharing of data
4. Allocate **more resources** to expand AI solutions
5. Increase **awareness**
6. Invest in development of **enhanced digital skills**
About the authors

Bracket Capital is a global multi-asset investment manager based in Los Angeles, California. Founded in 2017, Bracket Capital develops strategies that quickly meet and respond to the needs and aspirations of its investors. Bracket Capital employs a systematic methodology which identifies unique risk/reward profiles across the venture landscape. This hybrid strategy leverages access, insights and deal flow through its investments. As a partner and investor to the early-stage venture community, Bracket Capital is an ally to both entrepreneurs and fund managers. This approach provides Bracket Capital with the highest quality deal-flow, enhanced networks, and increased ability to diligence founders.

Bracket Foundation is the newly established venture philanthropy arm of Bracket Capital. Its mission is to harness the power of technology for social good. Each year Bracket Foundation pursues a theme with the aim to contribute to a global conversations on pressing social issues, raise awareness on how to leverage leading technologies in their respective fields and bring them to the forefront to tackle growing global challenges. This year’s theme is “Making the Internet Safer for Children” where Bracket Foundation in collaboration with its partners in both the private and public sector is working to unlock AI’s potential in the fight against Online Sexual Abuse of Children.

Value for Good is a consultancy specialized in the field of social impact that envisions a world in which effective action is taken to solve societal challenges. To achieve this Value for Good inspires through insights, advises through consulting and empowers through training. Value for Good serves leaders from private sector, governments, international institutions, foundations and non-profits and equips them with the knowledge and tools to make a positive and sustainable difference. For further information visit www.valueforgood.com.
Acknowledgments
The following individuals supported this study with interviews and input

Robert Beiser  Freedom Signal (Seattle Against Slavery)
Irakli Beridze  UNICRI Centre for AI and Robotics
Adam Blackwell  Development Services Group
Anna Borgström  NetClean
Sarah Brown  STOP THE TRAFFIK
Laura Clawson  International Justice Mission
Aldo Faisal  Imperial College London
Kevin Guo  HIVE
Cyrus Hodes  The AI Initiative (Future Society Initiative)
Jonas Kaiser  Berkman Klein Center for Internet & Society
Mayank Kejriwal  Memex, Information Sciences Institute (USC)
Dr. Unni Krishnan  Save the Children
Dr. Florian Ostmann  The Alan Turing Institute
Ahmed Ragab  Harvard Kennedy School
Lloyd Richardson  Project Arachnid
Lars Roemheld  QuantCo
Caitlin Ryan  Mayor’s Office of Policy, Washington DC
Homayra Sellier  Innocence en Danger
Rob Spectre  childsafe.ai
Michael Tunks  Internet Watch Foundation
Livia Wagner  Global Initiative Against Transnational Organized Crime for Tech Against Trafficking