

Science, technology, and human rights

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Introduction

Unlike most of the contributors to this volume, I am neither a human rights practitioner or lawyer by training, nor am I a family member or close friend of Christof Heyns. Rather I am a scholar of science, technology, and society who developed an interest in human rights as it became clear that science and technology were having a massive impact on our most fundamental rights in the 21st century. Few human rights practitioners have engaged more deeply in the positive and negative implications of science and technology on our most basic right – the right to a dignified life – than Christof. I first became familiar with him nearly a decade ago through two strands of his work: first on his efforts to verify evidence of war crimes at the end of the Sri Lankan Civil War that appeared in a video shown on British television; and second, his investigation of the ways that international law might be used to govern and regulate armed drones and autonomous weapons systems (AWS) both in the context of war and domestic law enforcement. I was fortunate to get to know him personally during an expert consultation associated with the Special Rapporteur's Report on the role of Information and Communication Technologies (ICTs) in the Protection and Promotion of Human Rights, as well as the process of revising the Minnesota Protocol, officially known as the *United Nations (UN) Manual on the Effective Prevention and Investigation of Extra-Legal, Arbitrary and Summary Executions*. Since then, we met less formally over lunch or coffee when I was visiting University of Pretoria to give lectures to the Masters programme on Human Rights and Democratisation in Africa or through email and videocalls. I am truly sad that those exchanges will no longer take place and that our friendship will not have the opportunity to develop further.

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What struck me most about Christof, other than his warm persona and brilliant mind – two recurring themes throughout this volume – was the profound sense of humanity that pervaded his analysis of complex technical, legal, and ethical issues. Few human rights scholars of his generation are as attuned to the importance of understanding the human rights implications of science and technology as he was. This awareness seems to have emerged as much from his curiosity about the world around him as it did from the realities of carrying out human rights investigations in the era of widespread smartphone adoption and increased accessibility of the internet and social media. As he noted in his 2015 Special Rapporteur's Report on ICTs and human rights, he was increasingly dependent upon 'information mediated through technology' in evaluating the claims that he was receiving about unlawful killings as a result of his role at the UN.¹ He was also aware that journalists and human rights advocates were also turning to technology to document rights abuses or verify claims received through other sources.

Technology and human rights documentation

Although he was trained in the methods and approaches of the first and second generations of human rights documentation, he was very much at the core of scholars and practitioners making sense of documentation possibilities brought about by new information and communication technologies – the so-called third generation of documentation practices (the first being intergovernmental investigations, the second being NGO-led documentation, and the third being more accessible digital-based documentation by a much wider variety of actors). His hope was that this third generation of documentation practices would open up, and ideally democratise, human rights fact-finding – providing ordinary people with a platform to share their experiences and engage with the global community in ways that had previously only been possible for the largest NGOs physically located in proximity to power. In order for this future to be realised however, Christof recognised that people simultaneously needed to be able to access these new communications technologies and also be shielded from the surveillance risks that were manifest in a technology that had the ability to track one's every move in the real world and online. Looking back on his work on this topic, it was fascinating to see that Christof was especially aware of the fact that technology, and the new people it brought into the human rights space, would be most effective when integrated into networks with

1 C Heyns 'Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions: Use of information and communications technologies to secure the right to life' (24 April 2015) United Nations General Assembly Human Rights Council A/HRC/29/37, 6.

existing institutions and organisations that had significant experience mobilising people, documenting rights violations, seeking redress for them, and advocating for change. Christof implored the international community to pay attention to the work being done on the ground by ordinary people and smaller organisations so that their efforts would not be in vain.

Christof's interest in new forms of documentation emerged from his work with forensic, ballistics, and video metadata experts to verify the contents of a horrific five-minute video provided to him by the British television station Channel 4 in November 2010, which seemed to show summary executions of Tamil prisoners (at least one of whom may have been a journalist) by government forces in 2009 in graphic detail, acts which the Sri Lankan government initially denied had occurred.² The government argued that the video in question had been fabricated – initially staged and shot with a high-quality camera and then altered to appear as if it had been filmed on a low-quality cellphone camera by another soldier – in order to discredit the government.

Building on work done by his predecessor Philip Alston earlier that year to investigate the authenticity of a shorter one-minute clip that briefly documented the killings, Christof and his team of experts determined that the longer video was in fact authentic and resolved certain questions that emerged from analysis of a shorter video that was included as a segment in the longer video.³ The video provided convincing evidence that several individuals had been summarily executed by government soldiers with high-powered automatic weapons at close range and with many of the victims blindfolded with their hands behind their backs. The video also provided convincing evidence that at least some bodies, including two female victims, were treated in an undignified manner after death. Based on this evidence, Christof, in his capacity as Special Rapporteur, requested that the government of Sri Lanka reopen their investigation into the killings, this time taking the crimes depicted in the video seriously and not simply seeking to undermine the credibility of this evidence. This investigation foreshadowed the emergence of kinds of open-source investigations that are now a routine a decade later.

Christof was willing to criticise big players in the human rights space when necessary. Indeed, he was quite critical when describing the technological capacity of the very body he reported to: the UN

2 'Sri Lanka: UN expert calls on Government to probe executions captured on video', UN News, 31 May 2011, <https://news.un.org/en/story/2011/05/376912> (accessed 29 October 2021); Christof Heyns, 'Report of the Special Rapporteur on extrajudicial summary or arbitrary executions, Addendum: Summary of information, including individual cases, transmitted to Governments and replies received' (27 May 2011) United Nations General Assembly Human Rights Council A/HRC/17/28/Add.1.

3 Heyns (n 2).

Human Rights Council. In his report on ICTs, he noted that ‘many Human Rights Council mechanisms encourage individual contact through insecure generic email addresses, with no warnings concerning security or suggestions of alternatives’.⁴ This ‘ignorance’ of the basics of digital security could have had significant implications if not corrected. He was further critical of the Council’s lack of capacity for engaging with digital evidence in its special investigations, which could, in the long term put it at risk of becoming isolated from the broader human rights community. This critique applied to international organisations more broadly. He wrote: ‘technological advances in gathering evidence remain only as effective, in real terms, as the accountability mechanisms to which they contribute and which are, in large part, external to the technology.’⁵ In that sense, the improved information streams offered by ICTs are necessary, but not sufficient, for better protection of human rights, including the right to life. That underlines the importance of international human rights mechanisms, including the Human Rights Council and its special procedures, being able to fully integrate this information into their proceedings and investigations. Some human rights NGOs – the so-called ‘second generation’ – are keeping pace with the innovations of the ‘third generation.’ It is vital that the ‘first generation’ catch up.⁶

In keeping with what one would expect from Christof, his conclusions about the impact of ICTs on human rights were nuanced and cautionary, while at the same time recognising the tremendous value that technology could bring to the work when implemented appropriately. Such proper implementation included both training for human rights practitioners and coordination among human rights groups, transnational organisations, and funders. He was concerned about highlighting the limits of technology – especially that one should not assume the comprehensiveness of digital information streams and that these streams should be seen as complementary to traditional human rights reporting and advocacy, not a replacement. He also highlighted what has become a central tension in human rights documentation since the publication of this report: the private ownership and control of the platforms through which digital information about human rights are shared. Thus, private, profit-driven corporations were in control of an important transnational quasi-public space that ordinary people, human rights advocates, governments, and international actors all depended on to advance the public good.⁷ While some of the challenges

4 Heyns (n 1) at 19.

5 Heyns (n 1) at 22.

6 Heyns (n 1) at 22.

7 As above.

that Christof identified have been addressed, most remain as relevant today as they were when the initial report was published in 2015.

Drones and autonomous weapons

Christof became aware of the need to investigate the use of armed drones in conflict through his work as the Special Rapporteur on extrajudicial, summary, or arbitrary executions. He took over that position in 2010 as the Obama administration was dramatically ramping up the drone capabilities of the United States military and using them extensively for targeted killings in the global ‘war on terror’. Like many other human rights scholars, he did not see the use of armed drones to kill as an inherent violation of human rights, but argued that they must be deployed in a way that respected international humanitarian law. More than anything, though, he worried about the ways that advances in artificial intelligence (AI) might one day facilitate autonomy in robotic weapons systems to the point that they were no longer under meaningful human control. It was this potential future that required immediate consideration, study, and action.

In 2016, he wrote in the introduction to a volume on the law, ethics, and policy of AWS that one of the core challenges of the modern era was to ensure that computational systems and AI ‘enhance and do not undermine human objectives’.⁸ Christof was not alone in being concerned about this challenge, but his writing and thinking on the subject always struck me as getting right to the heart of the matter in a clear and concise manner.

In that same introductory chapter, he noted that the ‘increased autonomy in weapons release now points to an era where humans will be able to be not only physically absent from the battlefield but also psychologically absent,’ as well.⁹ He was not distracted by the complexity or the novelty of the actual mechanism used to kill, but rather on how the decision to engage a target was made. AWS, he noted, ‘whether used in armed conflict or law enforcement, are weapon platforms, and any weapon can in principle be fitted onto an AWS. Therefore, the important distinguishing feature between different kinds of AWS is not the weapons they use but, rather, how they take their decisions – their levels of autonomy.’¹⁰ For Christof it was also crucial to understand not only the decision-making process, but why militaries, police forces, and technologists were seeking to remove humans from

8 C Heyns ‘Autonomous weapons systems: living a dignified life and dying a dignified death’ in N Bhuta and others (eds) *Autonomous weapons systems: law, ethics, policy* (CUP 2016) at 3

9 Heyns (n 8) at 4.

10 Heyns (n 8) at 6.

the immediate area of use or to automate aspects of the process so that humans are increasingly less involved in the lethal use of force.

Christof acknowledged the novelty of autonomous weapons, especially the violation of the ‘implicit assumption of international law and ethical codes that humans will be the ones taking the decision whether to use force, during law enforcement and in armed conflict’, but insisted that existing legal regimes were capable of governing them – even if that law dictates that certain autonomous actions not be taken under any circumstances.¹¹ For instance, while AI might one day be able to make reasonable decisions about who to target, what the intentions of that person or group are, and how much force is proportionate, we might still not want to allow autonomous targeted killings because allowing non-human entities to determine whether or not a person should live or die might violate the fundamental dictates of human dignity, that is, the inherent and incommensurable value of each and every human being. In his view, to ‘allow such machines to determine whether force is to be deployed against a human being ... may be tantamount to treating that particular individual not as a human being but, rather, as an object eligible for mechanised targeting.’¹² He cautioned against ‘[d]eath by algorithm,’ which, he reasoned

means that people are treated simply as targets and not as complete and unique human beings, who may, by virtue of this status, deserve to meet a different fate. A machine, which is bloodless and without morality or mortality, cannot do justice to the gravity of the decision whether to use force in a particular case, even if it may be more accurate than humans.¹³

The weapon had in a sense become the warrior, and for Christof, this was unacceptable, in large measure because he was concerned for the human dignity of even those individuals who were legitimate targets of lethal force under international law.¹⁴ The weapon must always remain a tool in human hands in order for the use of force to remain within the bounds of human dignity. While belligerents in an armed conflict might voluntarily put their lives on the line, their opponents were still required to respect their dignity even if they could be legitimately killed in battle. He wrote that ‘[w]ar without on-going human reflection is mechanical slaughter.’¹⁵ He further likened the development of autonomous weapons to making a decision to kill someone ‘in advance, in the abstract, and based on hypothetical scenarios’.¹⁶ We would find

11 Heyns (n 8) at 8.

12 Heyns (n 8) at 11.

13 Heyns (n 8) at 11.

14 Heyns (n 8) at 58; C Heyns ‘Autonomous weapons in armed conflict and the right to a dignified life: an African perspective’ (2017) 33 *South African Journal on Human Rights* 46 at 51.

15 Heyns (n 14) at 60.

16 Heyns (n 14) at 61.

this unacceptable in the context of a mandatory death penalty in which a legislature predetermined who in a criminal justice system would live or die in the criminal justice system without recourse to a judge or jury. This moral challenge was certainly recognised by other scholars and commenters, but Christof went a step further, pointing out that the dignity of the people in whose name autonomous weapons systems were being deployed might also be impacted by this decision. He recognised that this deployment might be seen as an abdication of moral responsibility to ‘bloodless agents’ in a way that being represented by human combatants would not. Part of the problem, he noted, is that a lack of systems to ensure accountability for violations of the right to life is in itself a violation of the right to life. By deploying technological systems that cannot be held accountable for their actions, we run the risk of (at least in theory) violating the right to life even if no one is actually ever killed. This is one reason why we might not want to deploy AWS even when there is the potential to save at least some lives that would be lost if they were not in action. This is not necessarily a satisfying conclusion, but it one that Christof came to:

The notion of the indivisibility and interdependence of all rights militates against the idea of an absolute hierarchy of rights, because it would mean that if there were a clash of rights – when it really matters – the one right would always trump the other. Dignity, if it is to assume its position as a meaningful right, must in some cases be able to trump other rights, including the right to life.¹⁷

Thus, even where lives may be saved, the right to dignity – including a dignified death – has to be considered as well. In a paragraph about the existential harm of autonomous weapons that continues to stick with me, Christof wrote:

The realities of modern warfare are, of course, such that someone who is about to be targeted in many cases does not have a real chance of appealing to the humanity of the person on the other side. However, the hope that this may be possible has so far not been completely excluded. With the introduction of autonomous weapons, there is no such chance. Having autonomous weapons as a legal and legitimate part of the world in which we live can undermine an important part of our hard-wiring: namely, hope. Psychologists have long emphasised the importance of a measure of optimism in human beings. An emphasis on hope indeed underlies many religious and other world views, as well as philosophical traditions. For machines to have the power of life and death over human beings may change some of our deep-seated assumptions about the world in which we live, and the extent to which we experience it as a place in which empathy, redemption, and mercy may be found. Where it is legally or even ethically permissible to use force, humans may decide not do so because something holds them back. This possibility is excluded when autonomous weapons are used.

17 Heyns (n 14) at 62.

This is the classical situation where a decision-maker says ‘It’s lawful, but it’s awful’ – and as a result not do it.¹⁸

This clarity extended to his core interest in how international law applied to new technological threats to human life. It was important for Christof to get to the heart of the matter and not to get lost in technical details or overwhelmed by the speed at which new technologies seem to develop. In evaluating new technologies, one must always ‘ask oneself at the outset what it is that one wants to protect and develop one’s approach around that answer’.¹⁹ It will be no surprise to anyone who knew Christof that he saw human rights as the most meaningful framework to think through the impact of AI and computing technologies on humanity.²⁰ Christof’s analysis applied to other applications of autonomous decision making in society. In his view,

the way we respond to autonomous weapons is a pivotal test case for the role of science in the future. The stakes cannot be higher – they are literally life and death – and how we deal with autonomous weapons will be the tone for how we deal with computers in general.²¹

And we should make technology evolve to satisfy the rights regime we have in place and not vice versa:

In a world dominated by computers and where power is legitimised by algorithms, the logical response to errors on the battlefield may be to call for technical improvements rather than traditional concepts of human accountability. Given the fact that accountability is an element of the protection of the right to life, this would entail a fundamental change in our understanding of the right to life.²²

For Christof, our analyses of new technologies must always be grounded both in the fundamental right to life and in human dignity. The goal is to ensure that humans have the most meaningful and dignified lives possible. Merely preserving ‘biological’ life is not enough.

Christof was technologically savvy when taking this approach and he was by no means a technophobe – he simply recognised the complexity of building artificial intelligence systems that upheld human dignity and the right to life. At a time when debates around AWS have increasingly become centered on the notion of ‘meaningful human control’ (MHC), he warned us that it is ‘an open-ended concept, and much will depend on the contents that it is given ... Much work is still required to give the concept application in the real world.’²³ In his view, it was crucial to develop and institutionalise an understanding of MHC that was both

18 Heyns (n 14) at 63.

19 Heyns (n 8) at 13.

20 Heyns (n 14) at 49.

21 Heyns (n 14) at 48.

22 Heyns (n 14) at 57.

23 Heyns (n 1) at 14.

meaningful and enforceable and centered on the use of technology to supplement human decision making rather than replace it.

Christof turned the rhetoric of proponents of AWS who focused on their surgical precision on its head. If AI enabled weapons with 'surgical precision,' then 'surgical standards' of evaluating their efficacy and legality ought to apply. Specifically, he made the following observation:²⁴

the 'protect life' principle applies to all uses of force by law enforcement officials, though temporary exceptions are made in the case of armed conflict. However, if the circumstances that justify such a more permissive approach no longer exist, it seems logical to accept that the 'protect life' principle demands a more rigorous approach. That is, if technology allows states more control over long-distance use of force and lifts the fog of war, it could be argued that states should be held to higher standards – there is less of a justification for the lower standards posed by IHL and more reason to resume the default position of human rights law. For example, where smart bombs, or other technology that allows for better targeting, are available there should be less tolerance for collateral damage. Moreover, should technology be developed that makes capture, rather than kill, possible, it should be used. Those who use advanced technology should also expect to be held to higher standards as far as accountability and transparency are concerned – as is the call already from many human rights groups in the context of armed drones.

Revision of Minnesota Protocol

I had the honour of being involved in small way in Christof's efforts to revise the *UN Manual on the Effective Prevention and Investigation of Extra-legal Arbitrary and Summary Executions* along with an amazing group of experts in international law, human rights advocacy, criminal investigation, and forensic science.²⁵ The goal was to update the manual, originally written in 1991, in light of significant advances in law and forensic science, as well as a much deeper appreciation for the rights and needs of families of people who go missing in times of war, conflict, and political unrest or die unlawful deaths at the hands of the state. Since other contributors focus on updates to the legal and psychosocial aspects of this manual, which is colloquially known as the Minnesota Protocol, here I focus briefly on revision to the scientific and technical dimensions.²⁶

Christof found the revision of the Minnesota Protocol so meaningful because it was the document that set the standards for the investigation of potentially unlawful killings by state and non-state actors. Without

24 Heyns (n 1) at 16.

25 Minnesota Protocol II.

26 C Heyns & others 'Investigating potentially unlawful death under international law: the 2016 Minnesota Protocol' (2019) 52 *International Lawyer* 47.

effective means to determine the fate of the missing, perpetrators cannot be held accountable, families do not know what happened to their loved ones, and impunity for the violation of the right to life reigns in communities and nations. Ultimately, the failure to investigate a potentially unlawful death is regarded, in itself, as a violation of the right to life. Widely agreed upon standards form a baseline for countries to incorporate into their laws and investigatory protocols, provide cover for government investigators and forensic scientists undertaking inquiries into politically contentious unlawful or suspicious deaths, and provide a metric for outside observers to use when determining the extent to which the state is living up to its obligations to respect the right to life and human dignity of its citizens and subjects.²⁷

Soon after taking on his role as the Special Rapporteur it became clear to Christof that the document needed to be thoroughly revised, especially with respect to new methods of documenting crime/death scenes, recovering human remains, determining cause and manner of death, and indentifying remains through DNA profiling. While the impetus for the revision emerged from the concerns of the forensic and medical practitioners who used it most often, Christof and his collaborators decided to use it as an opportunity to bring the legal sections up to date and further develop them in order to solidify the manual's approach using death investigation to support to the right to life. The revision clarified what circumstances trigger a state's legal obligation to investigate potentially unlawful deaths and what those states must do in this context.²⁸

Christof commissioned a noted forensic scientist, Dr Morris Tidball-Binz, the Head of Forensic Services at the International Committee of the Red Cross (ICRC), to undertake the revision of the sections on investigatory practice and brought in a wide variety of experts to consult on this process (including me). In addition, Christof and his collaborators sought input from governments and people with an interest in the investigation of unlawful and suspicious killings or disappearances. In keeping with standard practices in international standard-setting, the revised Minnesota Protocol includes both minimum requirements that must be followed without deviation and recommended actions that should be put into place whenever possible. While governments are the parties most responsible for investigations into potentially unlawful killings and disappearances, the manual is also meant for civil society organisations that conduct these investigations after the fact when

27 As above.

28 As above.

governments are unwilling or unable to do so, or when governments explicitly request non-governmental assistance.²⁹

Of particular concern during the revision process was the development of explicit guidance for the management of crime scenes and the recovery of evidence in a way that preserved its scientific and legal value while at the same time ensuring that the needs of families were respected. As Christof and his collaborators noted, developments in DNA analysis have made it possible to identify even the smallest and most damaged bits of human tissue and bone, and advances in forensic archaeology and pathology have dramatically improved the ability of investigators to determine when and how a person died. This had led to changes in norms associated with investigations of potentially unlawful deaths:

While, controversially, some early investigations carried out by the international criminal tribunals for the former Yugoslavia and Rwanda focused on gathering evidence for prosecution over the needs of families to have their loved ones identified, forensic scientists examining the dead are now expected to seek to identify remains as a matter of principle and to advance the rights of families. The 2003 Conference on The Missing and Their Families, organized by the ICRC, concluded that it is wrong to investigate the dead from armed conflicts or disasters if this investigation is focused exclusively on documenting the cause and manner of death and does not include efforts to identify the victims. In addition, the duty of medico-legal experts to protect the dignity of the dead has evolved since the publication of the first edition of the Protocol to become a universal requirement. In consideration of these developments, the new Protocol advocates for an integrated and scientifically sound approach to using forensic evidence. It calls for forensic human identification in every case of potentially unlawful death, outlining the general principles and the scientific approach required to reliably identify single or multiple bodies.³⁰

In addition to guidelines for states and civil society organisations, the 2016 revision of the Minnesota Protocol also included a new section that speaks directly to Christof's own integrity and his desire to ensure the integrity of the human rights field more broadly. This section on professional ethics of investigators begins from the fundamental principle that scientists and medical professionals should not just be beholden to the law or to the norms of their specific disciplines. Rather they bear special ethical responsibilities toward victims, their families, and the broader community of people impacted by the investigation. In addition to seeking truth through effective investigation practices, they must also work 'to advance the goals of justice and human

29 As above.

30 Heyns & others (n 26) at 74-75.

rights.³¹ Thus, no matter who contracts forensic specialists to work on the investigation, they must maintain their independence – especially when state actors are alleged or suspected to have been involved in the death. They must also work to ensure the safety, privacy, well-being, and dignity of anyone affected by the investigation and respect their cultures and customs. They also have a special obligation to minimise additional trauma to family members, to respect their needs and wishes as much as possible, and to uphold the fundamental dignity of the dead.

Conclusion: Upholding the right to protest

I would like to conclude this chapter in honour of Christof by briefly describing the direction of our more recent conversations about the role that technology might play in upholding the right of all people to peacefully protest. As many of the other contributors to this volume will surely attest, Christof was a passionate supporter of the right of all people to peacefully assemble to express themselves, air grievances, or celebrate things that matter to them. Throughout his career he has spoken out in support of protesters around the world – most recently during the Black Lives Matter movement that flourished in the United States in the months before his untimely death.

Christof also recognised that it was sometimes necessary for public officials to place some limits on protests and demonstrations in the name of public safety, although he argued that public safety should not be used as an excuse to shut down protests entirely. We spent a significant amount of time in our most recent conversations focusing on two issues in particular: the right of people to record law enforcement and military responses to protests; and the role that simulation technology might play in helping law enforcement officials respond to protesters in ways that de-escalated potential violence rather than increased the prospects for the use of force in such confrontations. By preserving the right to peacefully assemble and protest, and curbing violent state responses to such actions, Christof clearly hoped to preserve a space in which social change might take place through deliberation and discussion rather than violence and repression.

Christof hoped to use the latest developments in AI and virtual reality to create immersive environments in which law enforcement and military personnel could be desensitised to the feeling of the need to use violence to control crowds of demonstrators and trained to deescalate such situations instead. I played the skeptic in these conversations – pointing out that most available technology could not mimic the conditions that state agents would actually find themselves

31 Minnesota Protocol II, para 41.

in, that there wasn't much evidence that these sorts of training systems actually reduced the use of force, and that it was hard to use computing technology to rehumanise groups of people that might be seen as less worth of empathy or forbearance by state agents. Christof understood all of these things, but wanted to use any and every available tool to protect the right of assembly. He was not enamored with virtual reality in the way that a gamer or technophile might be; rather he wanted to know if there was any possible way to use it for the benefit of humanity.

This viewpoint typified Christof's overall approach to science and technology. It was never about innovation solely for the sake of being innovative, but rather about focusing on particular human rights goals and figuring out the most effective way to get there, which may or may not involve extensive reliance on science and technology. This is exactly the approach that I think is the right one, and one of the main reasons why I loved engaging with Christof, even when we did not see something the same way. I will miss him. Visits to Pretoria will not be the same without him.