

Center on Law, Ethics and National Security



Essay Series

Number 28

May 2, 2024

Uploading Culture: Navigating the International
Humanitarian Legal Framework Governing
Cultural Property in the Metaverse

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UPLOADING CULTURE: NAVIGATING THE INTERNATIONAL HUMANITARIAN LEGAL FRAMEWORK GOVERNING CULTURAL PROPERTY IN THE METAVERSE

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ABSTRACT

As business moguls buy digital art that has been minted as an NFT and Ukrainian citizens use 3D scanning technology to upload their at-risk cultural artifacts into digital archives, digital and digitized cultural property is becoming a new global trend. Protecting cultural property from illegal incursions by belligerents in wartime is also rising to the top of public awareness. In a world that might eventually integrate virtual reality with physical reality, it is worth exploring the way that the metaverse can be utilized to preserve cultural heritage along with the risks posed by belligerent cyber actors to the resulting cultural property. Part I of this paper discusses the newest developments in metaverse-building technology, including digital twin technology and NFTs, and their application to cultural property preservation. Part II discusses the existing international humanitarian legal framework that governs cultural property protection through the 1954 Hague Convention and its Second Protocol, the Geneva Convention and its additional protocols, the Rome Statute, and existing caselaw. Part III applies the international humanitarian legal framework to digital data, both created-digital and born-digital, concluding that if either type of digital property was state-controlled, it could qualify for cultural property protection. Part IV explores proposed standards for governing kinetic and cyber operations impacting the metaverse under international humanitarian law standards. Ultimately, this paper argues that the duty to safeguard cultural property will likely include increased digitization in the future and will require states to create clear governance standards for virtual reality.

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INTRODUCTION

The war in Ukraine exploded over 2 years ago, and as of April 2024, UNESCO has reported that 351 cultural sites in Ukraine have been damaged by Russian forces, including 29 religious structures, 157 buildings of historic value, 19 monuments, and 31 museums.¹ Ukraine's artifacts and art pieces have also been plundered—over 15,000 pieces have been reported as missing.² UNESCO estimates that the approximate cost of rehabilitation of the cultural and tourist sectors in Ukraine over the next ten years totals \$9 billion dollars.³ As some have noted, “Destroying unique Ukrainian identity, culture, and art is part of a ‘cultural cleansing’ dating back to the invasion of Crimea in 2014, that clearly facilitates Russia’s goal of reincorporating Ukraine into the Russian State.”⁴

Meanwhile, the Hamas-Israel conflict in Gaza has escalated for only a few months, and UNESCO has verified damage to 43 sites as of April 2024—10 religious buildings, 24 buildings of historical or artistic interest, 2 depositories of movable cultural property, 3 monuments, 1 museum, and 3 archeological sites.⁵ Mosques, museums, and ancient churches have all come under fire.⁶ According to one Palestinian activist, “Cultural heritage offers clues to the past while anchoring group identity and purpose in the present. That’s why consolidating control over a people, colonizing their land, or erasing their national aspirations starts by confiscating their art, artifacts, books, and buildings. Destroying cultural heritage is an attempt to destroy our hope.”⁷

In South Africa’s suit against Israel in the International Court of Justice, it echoed similar sentiments when alleging that Israel had committed war crimes against the Palestinian people, noting that “Israel has damaged and destroyed

¹ *Damaged cultural sites in Ukraine verified by UNESCO*, UNESCO (Apr. 16, 2024), <https://www.unesco.org/en/articles/damaged-cultural-sites-ukraine-verified-unesco#:~:text=As%20of%20April%202024%2C%20UNESCO%20has,museums%2C%2019%20monuments%2C%2014%20libraries%2C%201%20archive.>

² Tessa Solomon, *UNESCO Reports 341 Cultural Sites in Ukraine Damaged, Puts Recovery Costs at \$9B*, ARTNEWS (Feb. 15, 2024, 1:50 pm), <https://www.artnews.com/art-news/news/unesco-reports-341-cultural-sites-in-ukraine-damaged-puts-recovery-costs-at-9-b-1234696435/>.

³ *Id.*

⁴ Stella Martin, *The Strategic Importance of Protecting Cultural Heritage During International Conflict*, COLUM. J. OF L. & ARTS, <https://journals.library.columbia.edu/index.php/lawandarts/announcement/view/625>.

⁵ *Gaza Strip: Damage assessment*, UNESCO (Apr. 10, 2024), <https://www.unesco.org/en/gaza/assessment#:~:text=As%20of%20April%202024%2C%20UNESCO%20has,sites.%20Provisional%20protection%20to%20Saint%20Hilarion%20monastery.>

⁶ Ahmad Ibsais, *Israel’s Cultural Genocide is Destroying Gaza’s Very Memory*, THE NATION (Feb. 8, 2024), <https://www.thenation.com/article/world/gaza-cultural-genocide/>.

⁷ *Id.*

numerous centres of Palestinian learning and culture.”⁸ The ICJ, while not addressing this allegation directly, noted that destruction of culture is linked to genocide: “[g]enocide is a denial of the right of existence of entire human groups... such denial of the right of existence ... results in great losses to humanity in the form of cultural and other contributions represented by these human groups.”⁹

I. DIGITAL CULTURAL PROPERTY PRESERVATION: 3D SCANNING TECHNOLOGY AND THE METAVERSE

War is devastating, both on a human level and on a cultural level. Crimes that damage a people’s cultural heritage “touch upon the very notion of what it means to be human, sometimes eroding entire swaths of human history, ingenuity, and artistic creation.”¹⁰ The U.S. has made it a priority to protect cultural property, defining “inherently valuable, and often irreplaceable resources” as “works of art such as paintings, murals, and statues; historic and ancient buildings and monuments, and ruins of such structures; archaeological sites and artifacts found on or beneath the land or underwater, and their associated records and materials; museums, libraries, and archives, and their collections; and sacred places, such as churches, mosques, temples, shrines, sanctuaries, and cemeteries.”¹¹ The Department of Defense has provided a variety of safeguards to protect foreign cultural property outside of the United States, going further than the requirements of international law.¹²

Other states do not have this approach, as exhibited by the high levels of destruction of cultural property historically and even in the two current main armed conflicts. Recent developments in technology could provide a solution by allowing occupied peoples to effectively preserve their cultural heritage virtually, even when

⁸ Application of the Convention on the Prevention and Punishment of the Crime of Genocide in the Gaza Strip (South Africa v. Israel), Application Instituting Proceedings, 2024 I.C.J. 55 ¶ 91 (Dec. 29).

⁹ Application of the Convention on the Prevention and Punishment of the Crime of Genocide in the Gaza Strip (South Africa v. Israel), Order, 2024 I.C.J. 20 ¶ 65 (Jan. 26).

¹⁰ Martin, *supra* note 4.

¹¹ *Cultural Resources: International Cultural Property Protection*, DOD ENVIRONMENT, SAFETY & OCCUPATIONAL HEALTH NETWORK AND INFORMATION EXCHANGE (May 24, 2023), <https://www.denix.osd.mil/cr/international/>.

¹² *Questionnaire National report on the implementation of the 1954 Hague Convention and its two (1954 and 1999) Protocols (2017-2020)*, U.S. DEP’T OF STATE, <https://ogc.osd.mil/Portals/99/Law%20of%20War%202023/National-Reports-Questionnaire-United%20States%20of%20America%202017-2020.pdf?ver=FmmDJCG7hAs1bzzgNTs2qA%3d%3d> (“Although not required by Article 3 of the Convention, the U.S. Department of Defense (DoD) engages in a variety of measures for the safeguarding of cultural property outside the United States.”).

their cultural property is physically under attack: as the chair of the Danish UNESCO National Committee has noted, “during an ongoing war, traditional methods of cultural preservation are under pressure. So innovative technologies are a very welcome assistance.”¹³

One way to preserve cultural heritage using technology is the virtual archiving of buildings and monuments.¹⁴ Through apps like Polycam, citizens with no training have the ability to scan artifacts and upload 3D models of the artifacts into a permanent digital archive.¹⁵ In one initiative in Ukraine, called Backup Ukraine, this archiving of public works has been limited to a volunteer corps authorized by the government, but citizens are encouraged to record local heritage sites.¹⁶ To upload large scale scans to digital archives, professional services can supplement citizen participation by using laser scans and photogrammetry.¹⁷

A less commonly discussed means of preserving property digitally could be available through the creation of an entirely digital sector in the metaverse, in which a state’s cultural objects are uploaded using 3D scanning or are recreated within a virtual reality setting, integrating with physical and augmented reality. The metaverse is a fluid concept, but an increasingly popular definition describes it as composed of “a series of interconnected and immersive virtual worlds that afford their users a sense of presence via agency and influence.”¹⁸ *The* metaverse is “a single shared world based around an open architecture, whereby different entities and interoperable servers interconnect via a shared set of agreed-upon standards and interfaces,” as opposed to *a* metaverse, which is an individual virtual world created by a corporation or programming network.¹⁹ Depending on the development of the technology, smaller metaverses hold the potential to be independent hubs of corporate, city, and state action within the larger, “international” metaverse. Although full development of the larger metaverse will

¹³ Matthew Gault, *Backup Ukraine is Looking to Preserve the Country’s Cultural Heritage*, VICE (May 6, 2022, 9:00 am), <https://www.vice.com/en/article/dypmyv/backup-ukraine-is-looking-to-preserve-the-countrys-cultural-heritage>.

¹⁴ Stefan Ellerbeck, *Ukrainians are protecting their cultural landmarks with their phones. Here’s how*, WORLD ECONOMIC FORUM (Jan. 27, 2023), <https://www.weforum.org/agenda/2023/01/ukraine-cultural-heritage-technology-3d/>.

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*; *What role can technology play in historical heritage preservation*, TELEFÓNICA, <https://www.telefonica.com/en/communication-room/blog/what-role-can-technology-play-in-historical-heritage-preservation/>.

¹⁸ Jennifer McArdle & Caitlin Dohrman, *The Full Potential of a Military Metaverse*, WAR ON THE ROCKS (Feb. 18, 2022), <https://warontherocks.com/2022/02/the-full-potential-of-a-military-metaverse/>.

¹⁹ *Id.*

likely not be a reality for years to come,²⁰ businesses and governments are increasingly pouring funds into the development of individual metaverse assets and infrastructure.²¹

Because virtual land is easily created with code, and the metaverse itself is easily expandable, there is no natural scarcity within the metaverse; however, metaverse proponents hope that the blockchain, which is the foundation of metaverse technology, will allow the creation of virtual hubs of commerce and culture.²² Non-fungible tokens (“NFTs”) are especially relevant for these purposes, as an NFT is a “unique digital asset that represents a real-world object (e.g., art, music, photo, GIFs, collectibles, video game items, etc.) and whose data (e.g., proof of ownership, certificate of authenticity, sale information, etc.) is stored on the blockchain where it can be traded or sold.”²³ Importantly, NFTs have been considered for military use—the Air Force Materiel Command’s Digital Transformation Office is creating a challenge coin NFT, and plans to use NFT technology to “theoretically provide nontraditional incentives to appeal to a different generation of warfighters.... ‘beyond bonuses or the GI Bill.’”²⁴ Military applications aside, NFTs can allow digital art and virtual assets to be collected and

²⁰ Mark Zuckerberg, *Facebook Connect 2021*, FACEBOOK (Oct. 28, 2021), <https://www.facebook.com/facebook/videos/577658430179350/> (Mark Zuckerberg presenting what the metaverse could be in several years, noting “it’s a ways off, but you can start to see some of the fundamental building blocks take shape...in the next five or ten years, a lot of this is going to be mainstream. And a lot of us will be creating and inhabiting worlds that are just as detailed and convincing as this one on a daily basis.”).

²¹ See generally Lena Geraghty et al., *Cities and the Metaverse*, NATIONAL LEAGUE OF CITIES (Apr. 18, 2022) <https://www.nlc.org/resource/cities-and-the-metaverse/>; Yogesh K. Dwivedi, et. al., *Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy*, 66 INT’L J. INFO. MGMT. 1, 3 (2022), <https://doi.org/10.1016/j.ijinfomgt.2022.102542>.

²² Robert Frank, Metaverse real estate sales top \$500 million, and are projected to double this year, CNBC (Feb. 1 2022, 6:42 pm), <https://www.cnn.com/2022/02/01/metaverse-real-estate-sales-top-500-million-metametric-solutions-says.html>; see Geraghty, *supra* note 21, at 10 (decentralized finance models allow “users [to] purchase virtual property, goods and services, or nonfungible tokens (NFTs) in the metaverse and pay for them with whatever cryptocurrency the platform uses... The use of cryptocurrencies gives more power to users, reducing transaction costs, ensuring security via the blockchain and enabling them to personally benefit by monetizing their virtual worlds.”).

²³ Frank, *supra* note 22.

²⁴ Andrew Eversden, *Into the Military Metaverse: An empty buzzword or a virtual resource for the Pentagon?* BREAKING DEFENSE (Apr. 12, 2022, 7:35 am), <https://breakingdefense.com/2022/04/into-the-military-metaverse-an-empty-buzzword-or-a-virtual-resource-for-the-pentagon/> (quoting Jennifer McArdle, an adjunct senior fellow at the Center for a New American Security and head of research at Improbable U.S. Defense & National Security.)

transferred as scarce and unique objects, replicating physical property characteristics.

The ability to own digital property exclusively has led to the extensive growth of commercial virtual property, in the form of digital real estate.²⁵ In 2023, the metaverse real estate market was estimated to reach \$1.69 billion dollars; by 2032, it is projected to grow to a value of \$59.83 billion.²⁶ In addition to businesses investing in real estate within this emerging technology, governments and cities are “likely to move into the metaverse via digital city halls and other city operations in the near term.”²⁷ For instance, the city of Buffalo, New York has developed an app that allows visitors to its parks to scan their environment and see a historical view of the park overlaid on their current view.²⁸ Digitized copies of a city, built through 3D scanning technologies, have already been used in Boston, Massachusetts to map the city’s physical landscape in order to project and modify future building plans.²⁹ These cities use digital twin technology, which “pull[s] data from Internet of Things (IoT) devices for [real-time] digitization. [Digital twins] can represent any type of object, vehicle or system. They can also model physical environments such as buildings, factories, warehouses or larger environment systems like railroads, highways and energy grids.”³⁰

As for digital twin technology intersecting with cultural property, Seoul, South Korea, has announced plans to transition government services into the

²⁵*Global Metaverse in Real Estate Market Size, Share, Growth, Analysis*, EXPERT MARKET RESEARCH, <https://www.expertmarketresearch.com/reports/metaverse-in-real-estate-market> (“The exclusive nature of such assets and real estate is driving their demand among the global population.”).

²⁶ *Id.* (“Metaverse in real estate encompasses...virtual properties that can be used for buying, selling, and leasing. The users are able to explore these virtual locations and gain a realistic sense of the design, ambience, and the layout of the property.”).

²⁷ Geraghty, *supra* note 21, at 16.

²⁸ Geraghty, *supra* note 21, at 11.

²⁹ Geraghty, *supra* note 21, at 12 (“the Boston Planning and Development Agency (BPDA) has created a digital twin that maps the city’s physical landscape, from water and sewer systems to tree canopies. In the case of one controversial development proposal, the digital twin was used to assess shadows that a proposed new building would cast on a popular park, leading BPDA to modify the building plans and minimize the impact on the park.”).

³⁰ Ryan Kenny, *The Military Metaverse and the Future of Large-Scale Combat Operations*, THE CYBER EDGE BY SIGNAL (Aug. 1, 2022), <https://www.afcea.org/signal-media/cyber-edge/military-metaverse-and-future-large-scale-combat-operations>. Note that this technology poses risks; “the data digital twins contain can come with privacy issues. If people can access the information behind a twin, so can hackers. Srivastava said a city must decide how much detail to capture in its digital twin and what elements to make public, especially as the amount of data in the world increases. ‘There’s going to be more and more virtualization of the real world, and it’s only because it’s just so much easier to get data,’ he said. ‘I think it’s going to be leveraged in the future by cities.’” *Id.*

metaverse and to use digital twin technology to create a “virtual tourist zone which will host some of Seoul’s largest tourist attractions virtually. Seoul’s most popular festivals will be held in the metaverse, starting with a traditional Bosingak bell-ringing ceremony on New Year’s Eve.”³¹ Catalonia, an autonomous region in Spain, has also expanded into the metaverse, utilizing private companies and a virtual reality center to create a digital metaverse dedicated to its culture, showcasing Catalan music, language, and artifacts.³²

The use of digital twin technology to preserve cultural property is different from the currently utilized digitization of cultural property; rather than uploading individual scans of an object into a digital repository, digital twins are reconstructed using real-time and updatable data, and could one day represent actual city or state locations within the metaverse. Citizens might eventually be able to seamlessly interact with their state’s digital twin in augmented reality,³³ virtual reality,³⁴ or mixed reality.³⁵ In addition, digital twin technology within the metaverse has

³¹ Geraghty, *supra* note 21, at 14.

³² Ahmed A. Mansour, *A Local Metaverse that Speaks Catalanian*, DECENTIAL (Jan. 25, 2023), <https://www.decential.io/articles/a-local-metaverse-that-speaks-catalonian>.

³³ Dwivedi, *supra* note 21, at 28 (“Augmented Reality (AR) supports visitors already in physical spaces but presenting layered information on users’ portable screen devices, such as smartphones, glasses, wearables (Yovcheva et al., 2014). Graphical and informational content is presented in the user field of vision to overlay content and augment the sensory experience. Content is displayed through stationary (e.g., AR mirror), mobile (e.g., smartphone) or wearable (e.g., AR glasses) devices (Flavián et al., 2019). Information focuses on the user’s current context and geolocation as well as their vision, blending the real and digital worlds. AR provides great opportunities for brands and destinations to interact with visitors on location in real time and revolutionise their on-trip experience (Buhalis and Sinarta, 2019, Buhalis and Foerste, 2015). AR is of particular importance in cultural heritage attractions, museums, and archaeological sites as they can augment the display and overlay plans, performances, or scenes of daily life. For example, this would provide unprecedented interpretation opportunities in places such as Acropolis in Athens Greece or the Pyramids in Cairo Egypt. Superimposed timelines can display how monuments were developed and used over the centuries.”).

³⁴ *Id.* (“VR isolates users completely from the real world and brings them in a digitally constructed world by using VR glasses or a computer-assisted virtual environments (CAVE). The user is therefore immersed in the digital reconstruction and can navigate and interact through the computer-generated 3D environment (Flavián & Barta, 2022). VR effectively deceives the human mind to believe that it is located in the reconstructed reality. By doing so it allows virtual visitation of sites and experiences through a range of scenarios and storytelling. This is particularly useful when people would like to experience a facility or destination before deciding to purchase the product or visiting.”).

³⁵ *Id.* at 29 (“Metaverse in tourism will primarily take advantage of Mixed Reality (MR), integrating VR and AR with a range of new technologies to effectively blend the physical and virtual worlds. It ‘uses physical reality combined with MR (AR and VR) to converge all needs and stakeholders in a shared, 3D virtual space and enhances physical spaces to MR spaces, transforming the internet to a parallel virtual universe’ (Buhalis & Karatay, 2022). Visitors will be effectively stepping from physical to virtual worlds and then back to physical world seamlessly.

extensive applications for the U.S. military; once a “stable digital lattice” built on topographic data and critical infrastructure is established in a military-centric sector of the metaverse, “ever-changing data from real-world objects, such as the movement of civilian and military people and equipment, [c]ould be collected and collated to render digital twins” that could assist in operational planning and tactical simulations.³⁶

As the metaverse thus becomes more of a reality, nation states should begin considering its applications for the preservation and maintenance of their cultural property. By combining current 3D scanning technology with NFT and blockchain technology, governments could more seamlessly integrate new cultural development in the digital world with pre-existing cultural heritage. Nonprofits around the world have already begun integrating cultural property preservation with virtual reality. For instance, CyArk, sponsored by the U.S. State Department and established after the Taliban’s destruction of the Bamiyan Buddhas, aims to create an “immersive virtual reality environment” by using digital recordings, archives, and laser scanning tools to share cultural property sites around the world along with guided virtual reality tours of such sites.³⁷ In addition, the metaverse offers the potential for states to protect entirely digital cultural heritage; digital art, displayed in online museums, such as the Digital Museum of Digital Art, has already begun to emerge as a new category of artistic expression that could increase in cultural and historical value.³⁸

At the same time, however, developments in technology have changed the wartime capabilities and strategies of adversaries; cyberattacks are prevalent, and digital assets are uniquely vulnerable to threats posed by a wide variety of both state and private actors.³⁹ Complicating this analysis is the fact that cyberspace is itself a “global domain,” consisting of connected networks containing resident data and telecommunication networks.⁴⁰ Because cyberwarfare “occurs in the same virtual environment that houses culturally significant data... [and] digital and digitized

They take advantage of resources available to revolutionise their experience and maximise the value created. Effectively the universe becomes a blend of physical and virtual environment where physical presence is supplemented by virtual presence encapsulated with avatars. Virtual space applications, such as Second Life, have already been used in the past by tourism and hospitality organisations and destinations.”).

³⁶ Kenny, *supra* note 30.

³⁷ *Who We Are*, CYARK, <https://www.cyark.org/whoweare/>.

³⁸ Richard Ong, *Hard Drive Heritage: Digital Cultural Property in the Law of Armed Conflict*, 53 COLUM. H.R. L. REV. 248, 271 (2021); *See About Us*, DIMODA, <https://dimoda.art/#about-section>.

³⁹ Sophia Fox-Sowell, *Cyber hygiene needs to evolve, state cybersecurity officials say*, STATESCOOP (March 20, 2024), <https://statescoop.com/cybersecurity-hygiene-state-government-2024-evolve/>. (discussing cybersecurity hygiene and how the lack of appropriate cybersecurity practices can open vulnerabilities to foreign adversaries).

⁴⁰ Ong, *supra* note 38, at 266.

cultural property is often stored on devices connected to cyberspace, it is vulnerable to both cyberattacks and conventional attacks.”⁴¹ Indeed, as digital representations are increasingly considered to be cultural property themselves, practitioners should explore what constitutes a destruction of the cultural property in cyberspace and what standards govern attacking and preserving digital cultural property under international humanitarian law (“IHL”). As cultural heritage becomes more digitized and war is increasingly waged over cyberspace, nation states should understand the applicable international law framework that protects their digital cultural heritage, weigh the risks posed by their adversaries’ kinetic and cyber actions, and identify permissible offensive operations under IHL in order to best satisfy their legal obligations and protect their digital assets.

II. LEGAL FRAMEWORK

International humanitarian law has long provided protection for cultural objects; the International Criminal Court (“ICC”) has recognized that “the special protection of cultural property in international law” has an extensive history.⁴² This history includes the 1907 Hague Regulations and the 1919 Commission on Responsibility, which characterized the “wanton destruction of religious, charitable, educational, and historic buildings and monuments” as a war crime.⁴³ Explicit protection for cultural property began with the Civil War-era Lieber Code, when it mandated that items of cultural significance such as “classical works of art, libraries, scientific collections, or precious instruments . . . must be secured against all avoidable injury, even if they are contained in fortified places.”⁴⁴ Later, the 1907 Hague Regulations forbade seizure, destruction, and willful damage done to institutions, historic monuments, works of art, and science, yet “the [subsequent] World War I cultural property free-for-all” demonstrated the difficulty in enforcing these limitations.⁴⁵

A. The 1954 Hague Convention, the Geneva Convention, and Their Protocols

⁴¹ *Id.* at 267.

⁴² Prosecutor v. Ahmad al Faqi al Mahdi, Case No. ICC-01/12-01/15, Judgement and Sentence, ¶ 14 (Sept. 27, 2016).

⁴³ *Id.*

⁴⁴ U.S. Department of War, Instructions for the Government of Armies of the United States in the Field, General Orders No. 100, art. 35, Apr. 24, 1863 [hereinafter Lieber Code]. However, the Lieber Code also allowed conquering nations to take ownership of such cultural property, and questions of ultimate ownership would be settled by the treaty of peace. *See id.* at art. 36.

⁴⁵ GARY D. SOLIS, THE LAW OF ARMED CONFLICT: INTERNATIONAL HUMANITARIAN LAW IN WAR 563 (3d. ed. 2021); Convention No. IV Respecting the Laws and Customs of War on Land, art. 56, Oct. 18, 1907, 36 Stat. 2227, T.S. No. 539.

The 1954 Hague Convention for Protection of Cultural Property provided more specific protections for cultural property, along with enforcement mechanisms. It applies in armed conflicts and belligerent occupation; many of its provisions are so widely implemented that the International Committee of the Red Cross believes them to be customary law, and thus binding to all parties at all times.⁴⁶ The DoD Law of War Manual specifies that “DoD personnel... in the absence of contrary guidance by competent authority, should act as if they were legally bound by the rules for the protection of cultural property in the 1954 Hague Cultural Property Convention during hostilities even when conducting operations in the territory of a State that is not a Party to the 1954 Hague Cultural Property Convention.”⁴⁷

The 1954 Hague Convention applies to “property which forms part of the cultural heritage of ‘every people’”⁴⁸ and defines cultural property as:

movable or immovable property of great importance to the cultural heritage of every people, such as monuments of architecture, art or history, whether religious or secular; archaeological sites; groups of buildings which, as a whole, are of historical or artistic interest; works of art; manuscripts, books and other objects of artistic, historical or archaeological interest; as well as scientific collections and important collections of books or archives or of reproductions of the property defined above.⁴⁹

It also includes museums, libraries, depositories of archives, and refuges for movable cultural property, as well as centers containing a large amount of cultural property, such as monuments.⁵⁰

The phrase “of great importance to the cultural heritage of every people” has been interpreted to mean “of great importance to the national cultural heritage of

⁴⁶ *The 1954 Hague Convention*, BLUESHIELD AUSTRIA, <https://www.blueshield.at/the-1954-hague-convention.html>; CONG. RSCH. SERV., RL 32351, CULTURAL PROPERTY: INTERNATIONAL CONVENTIONS AND UNITED STATES LEGISLATION 2 (2004) (protection of cultural property is “now considered to be customary international law – binding on all nations regardless of ratification.”).

⁴⁷ OFF. OF GEN. COUNS., DEP’T OF DEF., LAW OF WAR MANUAL 1, 302 (2016), <https://media.defense.gov/2023/Jul/31/2003271432/-1/-1/0/DOD-LAW-OF-WAR-MANUAL-JUNE-2015-UPDATED-JULY%202023.PDF> [Hereinafter Department of Defense]; Solis, *supra* note 45, at 564 (“Now, cultural property protection is considered by the U.S. as customary international law, which applies equally to both international armed conflicts and non-international armed conflicts.”)

⁴⁸ SOLIS, *supra* note 45, at 572 (citation omitted.)

⁴⁹ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. I (a), May 14, 1954, 249 U.N.T.S. 240 (emphasis added).

⁵⁰ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. I, May 14, 1954, 249 U.N.T.S. 240.

each respective Party’ rather than to ‘all people collectively.’”⁵¹ Thus, individual States are responsible for identifying their nationally important cultural heritage objects.⁵² The DoD Law of War Manual notes that what counts as an object “of great importance to the cultural heritage of every people” is a subjective judgement, but ties cultural value to the fungibility of the item: “items that can easily be replaced would not qualify as being of great importance. On the other hand, irreplaceable items may be of great cultural importance, even if they have little monetary value.”⁵³ Thus, cultural property under international humanitarian law was not meant to include all items that could represent cultural heritage, such as “intangible cultural heritage,” a more expansive view that has been recognized elsewhere by UNESCO.⁵⁴ The Hague Convention’s definition has been interpreted more narrowly than that of other instruments, such as the Geneva Convention (discussed below).⁵⁵

The 1954 Hague Convention requires states parties to both safeguard their own cultural property and respect cultural property; they should “prepare in time of peace for the safeguarding of cultural property situated within their own territory against the foreseeable effects of an armed conflict, by taking such measures as they consider appropriate” and also separately refrain “from any use of the property and its immediate surroundings or of the appliances in use for its protection for purposes which are likely to expose it to destruction or damage in the event of armed conflict; and [refrain]... from any act of hostility, directed against such property.”⁵⁶ The latter mandate provides general protection to cultural property from, most

⁵¹ Ronald Alcalá, *Cultural evolution: Protecting “digital cultural property” in armed conflict*, 919 INT’L REV. RED CROSS 1083, 1093 (2022).

⁵² *Id.* at 1093–94.

⁵³ Department of Defense, *supra* note 47, at 303.

⁵⁴ UNESCO, BASIC TEXTS OF THE 2003 CONVENTION FOR THE SAFEGUARDING OF THE INTANGIBLE CULTURAL HERITAGE Art. 1 (2022 ed. 2022), https://ich.unesco.org/doc/src/2003_Convention_Basic_Texts-2018_version-EN.pdf.

⁵⁵ Department of Defense, *supra* note 47, at 303 (“For example, the Lieber Code contemplates protection for property belonging to “establishments of an exclusively charitable character, to establishments of education, or foundations for the promotion of knowledge, whether public schools, universities, academies of learning or observatories, museums of the fine arts, or of a scientific character,” as well as “[c]lassical works of art, libraries, scientific collections, or precious instruments, such as astronomical telescopes.” The Hague IV Regulations seek to protect “buildings dedicated to religion, art, science, or charitable purposes, historic monuments.” Hague IX seeks to protect “sacred edifices, buildings used for artistic, scientific, or charitable purposes, [and] historic monuments.” The Roerich Pact seeks to protect “historic monuments, museums, scientific, artistic, educational and cultural institutions.” API seeks to protect “historic monuments, works of art or places of worship which constitute the cultural or spiritual heritage of peoples.”).

⁵⁶ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 3-4, May 14, 1954, 249 U.N.T.S. 240.

importantly, acts of hostility.⁵⁷ This obligation can only be waived for imperative military necessity, which goes undefined in the original 1954 Convention.⁵⁸

The Convention also creates a special protection regime that applies to some refuges sheltering movable cultural property and centers containing “immovable cultural property of very great importance” if they are adequately distanced from an industrial center or important military objective and are not used for military purposes.⁵⁹ This protection is contingent on the cultural property being recorded on an International Register,⁶⁰ and “ensures immunity of the cultural property from any act of hostility.”⁶¹ Protection can only be withdrawn “in exceptional cases of unavoidable military necessity, and only for such time as that necessity continues.”⁶² As one scholar notes, “the stark fact is that the status of special protection does not guarantee to any cultural property – not even of the greatest importance – genuine immunity from attack and destruction.”⁶³ After the 1954 Convention and its First Protocol were promulgated, international recognition was slowed by drafting gridlock, slow signing by states parties, lack of effective enforcement mechanisms for ratifying states, and the ambiguity surrounding military necessity.⁶⁴

Pursuant to the Geneva Convention of 1949, “extensive destruction and appropriation of property, not justified by military necessity and carried out unlawfully and wantonly” is a grave breach.⁶⁵ In the 1977 Additional Protocols to the Geneva Convention, cultural property is likewise protected, albeit in narrower scope. For instance, Additional Protocol I prohibits acts of hostility against cultural objects, use of objects in support of the military effort, or making objects the object of reprisals, defining such objects as “historic monuments, works of art or places

⁵⁷ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 4, May 14, 1954, 249 U.N.T.S. 240.

⁵⁸ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 4, May 14, 1954, 249 U.N.T.S. 240; SOLIS, *supra* note 45, at 566.

⁵⁹ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 8(1), May 14, 1954, 249 U.N.T.S. 240.

⁶⁰ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 8(6), May 14, 1954, 249 U.N.T.S. 240. This register only contains a few items. YORAM DINSTEIN, *THE CONDUCT OF HOSTILITIES UNDER THE LAW OF INTERNATIONAL ARMED CONFLICT* 160 (2004).

⁶¹ DINSTEIN, *supra* note 60, at 159.

⁶² Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 11(2), May 14, 1954, 249 U.N.T.S. 240.

⁶³ DINSTEIN, *supra* note 60, at 160.

⁶⁴ SOLIS, *supra* note 45, at 568.

⁶⁵ *Research for CULT Committee—Protecting cultural heritage from armed conflicts in Ukraine and beyond*, at 31 (Mar. 2023), [https://www.europarl.europa.eu/RegData/etudes/STUD/2023/733120/IPOL_STU\(2023\)733120_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2023/733120/IPOL_STU(2023)733120_EN.pdf); Convention Relative to the Protection of Civilian Persons in Time of War, art. 147, Aug. 12, 1949, 6 U.S.T. 3516; 75 U.N.T.S. 287.

of worship which constitute the cultural or spiritual heritage of peoples.”⁶⁶ The International Criminal Tribunal for the former Yugoslavia (“ICTY”) has interpreted this provision to foreclose attacks on cultural property, even if the attacks do not result in actual damage.⁶⁷ Attacks in international humanitarian law “refer[] to combat action, whether in offense or defense. This means that in the language of international humanitarian law, attacks occur during a specific phase of an armed conflict—during the conduct of hostilities.”⁶⁸

There is no provision for waiving Additional Protocol I’s protection based on military necessity, but it was adopted “without prejudice” to the Hague Convention, which indicates that “reliance on military necessity is left open to those contracting Parties to the Protocol who are simultaneously Parties to the Convention.”⁶⁹ Notably, the Protocol’s invocation of “cultural or spiritual heritage covers objects whose value transcends geographical boundaries, and which are unique in character and are intimately associated with the history and culture of a people.”⁷⁰ Commentators have noted that “in case of doubt, reference should be made in the first place to the value or veneration ascribed to the object by the people whose heritage it is.”⁷¹ Ultimately, Additional Protocol I prohibits objects from being made into military objectives or destroyed; however, in response to “actual

⁶⁶Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts art. 53, June 8, 1977, 1125 U.N.T.S. 3; Protocol Additional to the Geneva Conventions of August 12, 1949, and Relating to the Protection of Victims of Non-international Armed Conflicts (Prot. II) art. 16, June 8, 1977, 1125 U.N.T.S. 609 echoes this language (“ it is prohibited to commit any acts of hostility directed against historic monuments, works of art or places of worship which constitute the cultural or spiritual heritage of peoples, and to use them in support of the military effort.”). According to the ICRC, despite the difference in terminology between the Hague Convention and the Geneva Convention, the basic ideas are the same. COMMENTARY ON THE ADDITIONAL PROTOCOLS OF 8 JUNE 1977 TO THE GENEVA CONVENTIONS OF 12 AUGUST 1949, ¶ 2064 (Yves Sandoz, Christophe Swinarski & Bruno Zimmermann eds., 1987).

⁶⁷ Prosecutor v. Jokic, Case No. IT-01-42-T, Sentencing Judgement, ¶ 50 (ICTY March 18, 2004), https://www.icty.org/x/cases/miodrag_jokic/tjug/en/jok-sj040318_e.pdf [<https://perma.cc/5QTX-VS2A>].

⁶⁸ James Powderly, *Prosecuting Heritage Destruction*, in CULTURAL HERITAGE AND MASS ATROCITIES 430, 439 (James Cuno and Thomas G. Weiss eds., 2022), <https://www.getty.edu/publications/cultural-heritage-mass-atrocities/part-4/25-powderly/>.

⁶⁹ SOLIS, *supra* note 45, at 574; DINSTEIN, *supra* note 60, at 160, 161.

⁷⁰ COMMENTARY ON THE ADDITIONAL PROTOCOLS OF 8 JUNE 1977 TO THE GENEVA CONVENTIONS OF 12 AUGUST 1949, ¶ 2064 (Yves Sandoz, Christophe Swinarski & Bruno Zimmermann eds., 1987).

⁷¹ COMMENTARY ON THE ADDITIONAL PROTOCOLS OF 8 JUNE 1977 TO THE GENEVA CONVENTIONS OF 12 AUGUST 1949, ¶ 2065 (Yves Sandoz, Christophe Swinarski & Bruno Zimmermann eds., 1987).

use ‘in support of the military effort’” by a foreign adversary, destruction is likely permissible under international humanitarian law.⁷²

In 1999, the Second Protocol to the 1954 Hague Convention effectively harmonized states’ obligations under the 1954 Convention and Additional Protocol I of the Geneva Convention, and additionally clarified states’ obligations under the original 1954 Convention and international legal principles.⁷³ First, the Second Protocol clarifies that cultural property protection can only be waived in cases where the property has been made into a military objective:⁷⁴ waiver can only be invoked when and as long as “that cultural property has, by its function, been made into a military objective; and there is no feasible alternative available to obtain a similar military advantage to that offered by directing an act of hostility against that objective.”⁷⁵ Importantly, the Protocol defines a military objective as “an object which by its nature, location, purpose, or use makes an effective contribution to military action and whose total or partial destruction, capture or neutralisation, in the circumstances ruling at the time, offers a definite military advantage.”⁷⁶ The Department of Defense’s Law of War Manual notes that military necessity can allow an act of hostility to be made on cultural property in the following scenarios:

If cultural property is being used by an opposing force for military purposes ... if an opposing force uses cultural property and its

⁷² DINSTEIN, *supra* note 60, at 162.

⁷³ DINSTEIN, *supra* note 60, at 164; *Research for CULT Committee—Protecting cultural heritage from armed conflicts in Ukraine and beyond*, at 31 (Mar. 2023), [https://www.europarl.europa.eu/RegData/etudes/STUD/2023/733120/IPOL_STU\(2023\)733120_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2023/733120/IPOL_STU(2023)733120_EN.pdf) (“In the greater international humanitarian law context, principles of distinction demand that combatants must not target cultural property unless the property becomes a legitimate military objective and if the capture, destruction, or neutralization of such property offers a definite military advantage. Proportionality principles dictate that belligerents cannot conduct an attack leading to excessive damage in relation to the military advantage to be gained. And of course, all feasible precautions must be taken to avoid incidental damage to civilian objects.”); Sahr Muhammedally, *Counter-Terrorism Hangover or Legal Obligation? The Requirement to Protect Civilians in War*, WAR ON THE ROCKS (Mar. 30, 2021) (Such precautionary measures include: “doing everything feasible to verify that the target is a military objective; taking all feasible precautions in the choice of means and methods of attack, with a view to avoiding, and, in any event, minimizing, the expected incidental damage; refraining from launching an attack that may be expected to violate the rule on proportionality; and cancelling or suspending an attack if it becomes apparent that the target is not a military objective or is subject to special protection, or that the attack may be expected to violate the rule on proportionality.”).

⁷⁴ SOLIS, *supra* note 45, at 571; Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, art. 6, Mar. 26, 1999, 2253 U.N.T.S. 172; DINSTEIN, *supra* note 60, at 164.

⁷⁵ Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, art. 6(a), Mar. 26, 1999, 2253 U.N.T.S. 172.

⁷⁶ Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, art. 1(f), Mar. 26, 1999, 2253 U.N.T.S. 172.

immediate surroundings to protect military objectives ... Or, if a military objective was located near cultural property, the protection afforded the area surrounding the cultural property could be subject to waiver for reasons of imperative military necessity such that the attack of the military objective would be permissible, despite its proximity to cultural property.⁷⁷

Waiver can also be granted to expose cultural property to likely destruction or damage “when and for as long as no choice is possible between such use of the cultural property and another feasible method for obtaining a similar military advantage.”⁷⁸ Article 7 of the Protocol requires that states “do everything feasible to verify that the objectives to be exposed or attacked are not cultural property” as defined in the Hague Convention of 1954, and to minimize incidental damage, which “in any event, must not be excessive in relation to the military advantage anticipated.”⁷⁹

The Second Protocol also delineates which cultural objects deserve enhanced protection, as opposed to general protection.⁸⁰ Enhanced protection attaches to cultural property “of the greatest importance for humanity,” which is protected by adequate domestic legal and administrative measures according to its recognized cultural value and not used for military purposes or to shield military sites; this is corroborated by the controlling state party through a declaration.⁸¹ Enhanced protection, once granted, does not give cultural property a higher level of protection than does general protection; it guarantees immunity from attack, but if the property becomes a military objective, the property can be subject to attack if attack is the only feasible means of terminating military use and all feasible precautions are taken in the “choice of means and methods of attack” to minimize damage to the cultural property.⁸² In cases of general protection, the *holder* of the cultural property can convert the property into a military objective by employing it in military action, but the *holder* using property with enhanced protection for these purposes is

⁷⁷ Department of Defense, *supra* note 47, at 309. The DoD Law of War Manual notes, though, that a proportionality analysis must still be conducted and feasible precautions put in place to reduce the risk of harm to cultural property.

⁷⁸ Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, art. 6(b), Mar. 26, 1999, 2253 U.N.T.S. 172.

⁷⁹ Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, art. 7, Mar. 26, 1999, 2253 U.N.T.S. 172; DINSTEIN, *supra* note 60, at 164.

⁸⁰ SOLIS, *supra* note 45, at 570.

⁸¹ Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, art. 10, Mar. 26, 1999, 2253 U.N.T.S. 172; DINSTEIN, *supra* note 60, at 165.

⁸² Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, art. 13(2)(a-b), Mar. 26, 1999, 2253 U.N.T.S. 172.

prohibited, and such a use would expose the *holding state* to criminal sanction as a war criminal under the Second Protocol.⁸³

To encourage enforcement, the Second Protocol created a prosecutorial hook, admonishing ratifying states to “take . . . necessary steps to prosecute” those who commit or order a breach of the Convention.⁸⁴ The Second Protocol also defined five serious violations of the protocol and requires parties to adopt measures to prosecute the five as criminal offenses under their domestic law.⁸⁵ These violations include:

- (a) making cultural property under enhanced protection the object of attack;
- (b) using cultural property under enhanced protection or its immediate surroundings in support of military action;
- (c) extensive destruction or appropriation of cultural property protected under the Convention and this Protocol;
- (d) making cultural property protected under the Convention and this Protocol the object of attack;
- (e) theft, pillage or misappropriation of, or acts of vandalism directed against cultural property protected under the Convention.⁸⁶

Notably, the U.S., Russia, Ukraine, and Israel are among the 135 states to ratify the 1954 Convention; only Ukraine has acceded to the Second Protocol, which has only been acceded to or ratified by 88 states.⁸⁷

B. The Rome Statute and Enforcement

In practice, enforcement of these internationally held values has been limited, but they have still had an impact on some bad actors. In 1993, the UN Security Council established the ICTY, which was given jurisdiction with respect to war crimes committed on the territory of Yugoslavia, including “seizure of, destruction or wilful damage done to institutions dedicated to religion, charity and education, the arts and sciences, historic monuments and works of art and

⁸³ SOLIS, *supra* note 45, at 570 (quoting DINSTEIN, *supra* note 60, at 158.)

⁸⁴ SOLIS, *supra* note 45, at 569 (because the Second Protocol has not clearly defined what violations call for sanctions, this has remained a dead letter); Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, art. 15, Mar. 26, 1999, 2253 U.N.T.S. 172.

⁸⁵ Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, art. 15, Mar. 26, 1999, 2253 U.N.T.S. 172.

⁸⁶ Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, art. 15, Mar. 26, 1999, 2253 U.N.T.S. 172.

⁸⁷ SOLIS, *supra* note 45, at 572; *States Parties*, UNESCO, <https://www.unesco.org/en/heritage-armed-conflicts/convention-and-protocols/states-parties>.

science.”⁸⁸ Within larger cases, the ICTY held several criminal actors responsible for destruction of cultural heritage, including Pavle Strugar, who commanded the shelling of the Old Town of Dubrovnik, a UNESCO World Heritage Site in Croatia; these holdings foreshadowed the trajectory of cultural property accountability measures through the ICC.⁸⁹

In 2002, the ICC was established, and has jurisdiction under Article 8 of the Rome Statute to prosecute war crimes against cultural property.⁹⁰ Under the Rome Statute, “intentionally directing attacks against civilian objects . . . [or] buildings dedicated to religion, education, art science or charitable purposes, historic monuments . . . provided they are not military objectives” is considered a war crime.⁹¹ This provision protects specific immovable cultural property, emphasizing “civilian use rather than the cultural value of the protected property . . . the scope of the provision is further limited by the exclusion of movable cultural objects.”⁹² Notably, the United States, Ukraine, Russia, nor Israel are parties to this statute; however, in 2015, “the ‘State of Palestine’ acceded to the Rome Statute.”⁹³

Although “there have only been rare successes amid a plethora of failures and missed opportunities,” the *Al Mahdi* case stands out as a clear example of the ICC’s enforcement power.⁹⁴ As a leader of the fundamentalist sharia morality brigade, the Hesbah, Ahmad al Faqi al Mahdi was instructed to destroy the mausoleums of saints in Timbuktu’s cemeteries, because any construction over a tomb was contrary to sharia law, and he destroyed nine mausoleums and the revered door of the Sidi Yahia mosque in 2012.⁹⁵ The ICC, pursuant to an investigation, brought al Mahdi to trial for “his role in the destruction of religious and cultural heritage.”⁹⁶ This was the first case focusing exclusively on crimes against cultural heritage, described by Chief Prosecutor Bensouda as “involv[ing] the most serious crimes; they are about the destruction of irreplaceable historic monuments, and they

⁸⁸Statute of the International Criminal Tribunal for the former Yugoslavia art. 3(d), S.C. Res. 827 (May 25, 1993), adopting The Secretary-General Report Pursuant to Paragraph 2 of Security Council Resolution 808; Powderly, *supra* note 68, at 436.

⁸⁹ Powderly, *supra* note 68, at 437.

⁹⁰ Powderly, *supra* note 68, at 439.

⁹¹ Rome Statute of the International Criminal Court art. 8(2)(b)(ii), (ix), July 17, 1998, 2187 U.N.T.S. 90; JENNIFER K. ELSEA, CONG. RSCH. SERV., LSB10709, WAR CRIMES: A PRIMER 4-5 (2024).

⁹² Powderly, *supra* note 68, at 439.

⁹³ ELSEA, *supra* note 91, at 4; *Assembly of States Parties to the Rome Statute*, ICC, <https://asp.icc-cpi.int/states-parties>.

⁹⁴ *Id.*

⁹⁵ Powderly, *supra* note 68, at 440; Prosecutor v. Al Mahdi, ICC-01/12-01/15, Judgement & Sentence, ¶¶ 31-44 (Sept. 27, 2016).

⁹⁶ Powderly, *supra* note 68, at 440.

are about a callous assault on the dignity and identity of entire populations and their religious and historical roots.”⁹⁷

Al-Mahdi pleaded guilty to the charges, but the Court still addressed whether the destruction of the mausoleums outside of the conduct of hostilities impacted the analysis of whether cultural property had been destroyed for the purposes of Article 8.2.e.iv of the Rome Statute; it noted that there was no distinction necessary based on the “special status of religious, cultural, historical and similar objects.”⁹⁸ This case, while limited in scope, demonstrates that protection of cultural heritage is an internationally recognized value, and can be enforced to some degree. As one commentator noted, the limits of the ICC demonstrate that “it is imperative that international criminal justice be seen as a subsidiary, rather than as a primary, means of accountability . . . it is for states to follow if there is to be meaningful accountability for the scourge that is cultural heritage destruction.”⁹⁹

III. THE EXISTING INTERNATIONAL HUMANITARIAN LEGAL FRAMEWORK’S APPLICABILITY TO DIGITAL CULTURAL PROPERTY

The difficulty in a more digitally advanced world is applying these century-old rules to twenty-first-century technology: “though theoretically applicable to digital works, it is unclear exactly how rules designed to protect physical objects should extend to digital creations.”¹⁰⁰ No state has formally recognized digital data as cultural property.¹⁰¹ As a starting point to determining whether digital works are protectable as cultural property, it is important to distinguish between born-digital works and created-digital materials. Born-digital works “result from an ‘all-digital’ process of initial production, the message being digitally encoded at the moment of

⁹⁷ Powderly, *supra* note 68, at 440–41.

⁹⁸ Powderly, *supra* note 68, at 441; Prosecutor v. Al Mahdi, ICC-01/12-01/15, Judgement & Sentence, ¶ 15 (Sept. 27, 2016) (“The Chamber considers that the element of ‘direct[ing] an attack’ encompasses any acts of violence against protected objects and will not make a distinction as to whether it was carried out in the conduct of hostilities or after the object had fallen under the control of an armed group. The Statute makes no such distinction. This reflects the special status of religious, cultural, historical and similar objects, and the Chamber should not change this status by making distinctions not found in the language of the Statute. Indeed, international humanitarian law protects cultural objects as such from crimes committed both in battle and out of it.” This understanding is arguably specific to the Rome Statute, rather than international humanitarian law’s more narrow definition of “an attack.”).

⁹⁹ Powderly, *supra* note 68, at 445.

¹⁰⁰ Ronald Alcalá, *Ukraine Symposium—The Ukraine Conflict and the Future of Digital Cultural Property*, ARTICLES OF WAR (May 13, 2022), <https://lieber.westpoint.edu/ukraine-conflict-future-digital-cultural-property/>.

¹⁰¹ Alcalá, *supra* note 51, at 1096.

its creation.”¹⁰² Born-digital material includes data recorded and stored digitally, in addition to original creative works.¹⁰³ Meanwhile, digital surrogates, or “created-digital” materials, are copies of existing physical property replicated digitally.¹⁰⁴

The Tallinn Manual 2.0, an influential resource explaining how international law applies to cyber operations in peace time and armed conflicts, recommends that international humanitarian legal protection apply to cultural property that could be affected by cyber operations, including digital property, but distinguishes between born-digital and created-digital data.¹⁰⁵ While not itself binding international law, the Tallinn Manual 2.0 has promulgated a rule mandating that “the parties to an armed conflict must respect and protect cultural property that may be affected by cyber operations or that is located in cyberspace,” particularly refraining from using “digital cultural property for military purposes.”¹⁰⁶ This rule is a reflection of “the general theme” of the 1954 Hague Cultural Property Convention, its two Protocols, and Additional Protocols I and II of the Geneva Convention, and incorporates the definitions and regulations within those articles into its analysis of the protections digital property deserves.¹⁰⁷

Although the International Group of Experts contributing to the Tallinn Manual 2.0 agreed on the fact that some “digital cultural property” deserves protection, it split on what constituted such property; some experts asserted that “intangible items like data” do not qualify as a “cultural object” under Article 53 of Additional Protocol I of the Geneva Convention,¹⁰⁸ while others were open to

¹⁰² Jean-Michel Rodes, Geneviève Piejut & Emmanuèle Plas, *Memory of the Information Society*, UNESCO 39 (2003).

¹⁰³ Alcalá, *supra* note 51, at 1099.

¹⁰⁴ *Id.*

¹⁰⁵ TALLINN MANUAL 2.0 ON THE INTERNATIONAL LAW APPLICABLE TO CYBER OPERATIONS (Tallinn Manual 2.0) 534 r. 142 (Michael N. Schmitt ed., 2017).

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ Alcalá, *supra* note 51, at 1096 (“In the commentary to Rule 100, the Tallinn Manual 2.0 states: “The meaning of the term ‘object’ is essential to understanding this and other Rules found in the Manual. An ‘object’ is characterised in the ICRC [International Committee of the Red Cross] Additional Protocols 1987 Commentary as something ‘visible and tangible’.” Accordingly, a majority of the International Group of Experts determined that “the law of armed conflict notion of ‘object’ is not to be interpreted as including data, at least in the current state of the law.”). Within the Tallinn Manual 2.0, the Experts are inconsistent in their discussion of whether data is an object; although the Experts generally reject the idea that intangible items could be objects, Rule 142 explains “how intangible items could be ‘property’ before reverting to the use of the term ‘object’ to describe certain digital material.” *Id.* at 1100, n.97. This inconsistency reflects a larger debate regarding whether or not data is or should be considered an object under international humanitarian law. See Kubo Mačák et. al., *Scenario 12: Cyber operations against computer data*, Cyber Law Toolkit, https://cyberlaw.ccdcoe.org/wiki/Scenario_12:_Cyber_operations_against_computer_data.

intangible items being cultural property in some circumstances.¹⁰⁹ Rule 142 of the Tallinn Manual recognized that born-digital data, including digital originals, and digital surrogates, could both qualify as digital cultural property, showing “a strong preference for original works, whether initially created digitally or in a tangible medium.”¹¹⁰

Importantly, the Tallinn Manual 2.0 contemplates born-digital items’ protection under international humanitarian law, citing several examples of “objects that are created and stored on a computing device and therefore only exist in digital form, such as musical scores, digital films, documents pertaining to e-government, and scientific data.”¹¹¹ According to these experts, born digital property that holds “great importance to the cultural heritage of every people,” such as scientific data and e-government documents, in accordance with the Hague Convention of 1954, could be protectable under international humanitarian law; this view is also advocated by several scholars.¹¹²

Some Experts argue that the ordinary meaning of the term “object” cannot include data because it is not material, visual, and tangible; under this view, “cyber operations against data would not fall within the ambit of the relevant rules of IHL unless the operation in question resulted in some physical effect and/or a loss of functionality of the target system or network. Some States, including Denmark, Chile, [and] Israel, also subscribe to this view. By contrast, others have argued that either all or some types of data should be considered as “objects” under IHL. One view, taken by several States – including Finland, Germany, Norway, and Romania – is that the protection of civilian objects extends to civilian data. This implies that all data constitutes an ‘object’ for the purposes of IHL.” *See id.* *See also* Davide Giovannelli, *Customary International Law, National Law, and Considering Data as Objects*, *Articles of War* (Nov. 15, 2023) (discussing Italian case law that equates data with objects for domestic legal purposes and suggesting that data should be construed as an object for international humanitarian law purposes). This full debate is outside the scope of this paper, but given the special treatment that cultural property enjoys under IHL, characterizing data assessed to be important to the “heritage of every people” as an object for IHL purposes seems warranted.

¹⁰⁹ TALLINN MANUAL 2.0, *supra* note 105, at 535; Alcalá, *supra* note 51, at 1097 (“Reasoning by analogy, these experts pointed out that other intangible material, such as intellectual property, has been widely recognized as “property” under international law and many domestic legal systems. Accordingly, cultural heritage need not manifest physically to qualify for protection as cultural property.”)

¹¹⁰ Alcalá, *supra* note 51, at 1102.

¹¹¹ TALLINN MANUAL 2.0, *supra* note 105, at 535.

¹¹² *Id.*, Ong, *supra* note 38, at 294 (“By framing digital and digitized cultural property as archives and records, existing international treaties can provide some degree of legal protection to this rapidly growing form of cultural heritage. This protection is particularly valuable, given the lack of an international effort to expand cultural heritage protections in the law of armed conflict.”); Alcalá, *supra* note 51, at 1116 (“born-digital works, like physical artifacts of the past, have the potential to hold great cultural importance – that is, to be regarded as cultural heritage – for future generations. Accordingly, they deserve to be protected, too, and States should thoughtfully and deliberately identify the digital creations they regard as national cultural heritage”); Dwivedi,

The Tallinn Manual 2.0 also extended the possibility of protection to created-digital copies of original physical works but made clear that “protection of cultural property is afforded based on the value and irreplaceability of the original work of art, and on the difficulty, time, and expense involved in reproducing faithful copies of that original.”¹¹³ Thus, because some digital data can be easily reproducible, the Tallinn Manual arguably does not extend the applicability of IHL to replaceable created-digital works.¹¹⁴ In many of the experts’ views, some created-digital works are simply replicas of existing physical works and, if the original tangible work still exists, lack what lends importance to many tangible cultural objects, “authenticity” and “aura.”¹¹⁵ According to this logic, since authenticity, a reflection of a work’s being in time and space, and aura, the authority of an original, unique work, arguably do not attach to digital reproductions of that same work, created-digital replicas of existing cultural property do not deserve protection.¹¹⁶

Yet, as other scholars have argued, the Tallinn Manual 2.0’s view on created-digital works might be overly restrictive, drawing protections for digital property more narrowly than they would be under the Hague Convention itself.¹¹⁷ Created-digital works could fall comfortably within the 1954 Hague Convention’s protections if they were construed as reproductions of cultural property, which are already protected under Article 1 of the 1954 Hague Convention.¹¹⁸ Created-digital

supra note 21, at 30 (“For example, Aydoğan (2021) advocated that in relation to VR exhibitions, metaverse exhibitions introduce novel aesthetic perceptions and preserve the aura of art.”).

¹¹³ TALLINN MANUAL 2.0, *supra* note 105, at 536.

¹¹⁴ *Id.* (“Protection only applies to digital copies or versions where the original is either inaccessible or has been destroyed, and where the number of digital copies that can be made is limited”); Alcalá, *supra* note 51, at 1101 (“Notably, the Tallinn Manual 2.0 focuses on the extent of replication rather than the quality of the reproduced material.”)

¹¹⁵ Alcalá, *supra* note 51, at 1085 (quoting philosopher Walter Benjamin, who argued that a copy of a unique work of art – even “the most perfect reproduction” of it – could never equal the original because copies could not capture the “authenticity” or possess the “aura” of their exemplars); *Id.* at 1107–08 (“the Tallinn Manual 2.0’s approach seems to preclude the possibility that reproductions of physical objects (a digital photograph, for example, or a 3-D scan of a cultural object) could be protected as original works themselves – in other words, as born-digital material. Accordingly, the commentary conditions the protection of digital surrogates on the non-existence or inaccessibility of their physical exemplars.”).

¹¹⁶ *Id.* at 1107 (For example, “the commentary to Rule 142 states: ‘Protection only applies to digital copies or versions where the original is either inaccessible or has been destroyed, and where the number of digital copies that can be made is limited.’”)

¹¹⁷ *Id.* at 1109 (“Accordingly, the Tallinn Manual 2.0’s approach to digital surrogates may be more constrictive than the Cultural Property Convention’s protective regime.”).

¹¹⁸ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 1(a), May 14, 1954, 249 U.N.T.S. 240 (cultural property can be “irrespective of origin or ownership...important collections...of reproductions of the property defined above”); Alcalá, *supra* note 51, at 1110 (“The Convention provides that in addition to the examples of movable and

objects, and their born-digital repositories, could also be construed as archives and records.¹¹⁹ When tangible cultural property is digitized and stored in a digital archive or internet server, it is functionally no different than that same property displayed in a physical museum, library, or physical archive.¹²⁰

UNESCO also ascribes to an expansive view of digital cultural property; it has posited that digital heritage, created by the digital maintenance of books, works of art, and monuments in digital form, is a valid form of cultural property and has adopted a charter mandating its preservation.¹²¹ It defines digital heritage as “cultural, educational, scientific and administrative resources, as well as technical, legal, medical and other kinds of information...*converted into digital form from existing analogue resources.*”¹²² To this end, several signatories to the Hague Convention have included created-digital cultural data in their reports filed pursuant to the 1954 Convention.¹²³

Born-digital works pose a different problem because of the nature of cyberspace and the difficulty in ascertaining born-digital property’s cultural value.¹²⁴ As mentioned, many of the experts involved in the drafting of the Tallinn Manual declined to extend cultural property protection to solely intangible modes of property, including born-digital data, because they argued that an “object” should

immovable property described in Article 1, reproductions of the property outlined in Article 1(a) also constitute cultural property.”)

¹¹⁹ Ong, *supra* note 38, at 274, 276.

¹²⁰ *Id.* at 274, 276 (arguing that “An archive, ‘a repository or collection especially of information,’ is a particularly apt description of digital information, which is normally stored either on a device’s local hard drive or a server connected to the internet. While a 3D scan of a historic monument is not a historic monument itself, it is a reproduction of an important monument of architecture that is filed away alongside other 3D scans, like books on a shelf... As a result, both the content hosted by these websites, as well as the websites themselves, ought to be protected by IHL, just as it already protects the documents contained within a physical archive.”).

¹²¹ U.N. Educ., Sci. and Cultural Org. [UNESCO], *Charter on the Preservation of Digital Heritage*, at pmb., CL/3865, (Oct. 2, 2003), <https://www.unesco.org/en/legal-affairs/charter-preservation-digital-heritage>.

¹²² *Id.* at art. 1.

¹²³ Ong, *supra* note 38, at 277–78 (“Belgium included its digitization of museum institutions, Cyprus mentioned its use of GIS technologies to create an inventory of ancient monuments, Greece referenced its ‘digitalization of the archive of monuments,’ and Australia noted its efforts at digitizing archives, as did Turkey and Estonia. Azerbaijan considered its digitization of aged sound records to be a fulfillment of its peacetime treaty obligations under the 1954 Hague Convention, and Germany did the same with over two million archival documents from the Wossidlo ethnographic archive. Following suit, the Holy See has digitized over 400,000 pages of reproductions from its archives, ‘providing the minimum necessary redundancy to guarantee the conservation of high-quality copies in the event the originals are lost.’”).

¹²⁴ With the exception of UNESCO, which recognizes that information “created digitally” has “lasting value and significance, and therefore constitute[s] a heritage that should be protected and preserved current and future generations.” UNESCO, *supra* note 121, at art. 1.

be tangible.¹²⁵ Complicating this analysis is that born-digital creations are generated and stored as code, and the digital work is arguably reproduced each time a digital file is executed.¹²⁶ As one scholar has asserted, “because digital creations possess no aura and comprise no physical material, valuable or otherwise, their worth is largely a reflection of their intellectual achievement.”¹²⁷

Even so, advances in NFT technology could rectify these aura and authenticity issues; NFTs can attach a unique identifying code to born-digital data, serving to represent authenticity and ownership.¹²⁸ In some cases, the creator or owner can store unique information in an NFT’s metadata.¹²⁹ However, an NFT is not considered part of the work, which is often hosted elsewhere on the internet; even owners of the NFT must view the file wherever it is hosted online, and others can still generally access the work itself.¹³⁰ Yet the normative value of an NFT in signaling an individual’s exclusive relationship to the work, can promote a sense of digital scarcity, which enables monetization and increasing trade of such goods.¹³¹ Currently, NFTs are promulgated by private actors, rather than states, but some have suggested that they could still be “used to ascertain whether a work might be culturally important.”¹³² The inquiry of whether born-digital data should be protected as a cultural object of great importance thus hinges more on whether the item is in fact “cultural” in nature and value, rather than its origin as a born-digital item.¹³³

Thus, while experts are split on the issue, it is arguable that if appropriately cultural in nature under existing international humanitarian legal standards, some born-digital and created-digital property could be construed as cultural property. The metaverse, which is the focus of this paper, offers an unprecedented opportunity for these two types of digital objects to interact.

As already described, existing metaverse projects have created “virtual twins” of physical cities, monuments, and art using 3D scanning technology. In the future, these digital proxies will likely be integrated more fully into virtual reality, attached to born-digital infrastructure. In addition, in augmented reality platforms, tangible objects or created-digital objects can be integrated with entirely born-digital objects, creating hybrid objects: “for example, the impression of architecture can

¹²⁵ TALLINN MANUAL 2.0, *supra* note 105, at 535.

¹²⁶ Alcalá, *supra* note 51, at 1114.

¹²⁷ *Id.* at 1111.

¹²⁸ *Id.* at 1112–13.

¹²⁹ *Id.* at 1115.

¹³⁰ *Id.* at 1113.

¹³¹ *Id.* at 1112.

¹³² *Id.* at 1115.

¹³³ TALLINN MANUAL 2.0, *supra* note 105, at 535 (“The critical question is whether the intangible property is cultural in nature”).

be changed, or objects can be supplemented with virtual elements changing the character of the tangible object in the perception of the user.”¹³⁴ If these objects are designed to preserve a state’s existing cultural heritage, or to serve as new cultural heritage, they would likely be protected under international humanitarian law. These created-digital, born-digital, and hybrid objects could represent replicas or archives of existing cultural property, as created-digital property, or they could be considered cultural property in their own right as born-digital property, assuming they are not easily reproduced through the use of NFT technology.

Because of the difficulties in defining the aura and authenticity of entirely digital cultural heritage objects, born-digital infrastructure, such as metaverse specific real estate and born-digital art, might take longer to be recognized as cultural property.¹³⁵ Even so, as the metaverse itself becomes a globalized and limitless sector without physical walls, the integration of both types of created-digital and born-digital property with NFT technology could lend aura and authenticity to these objects. Once this is accomplished, future practitioners might be required to consider what defines the “culture of every people” in a new, deterritorialized world.¹³⁶ Under existing standards, however, as current governments make an inroad into the metaverse, it is likely that some state-designated digital property, whether characterized as a replica of an existing

¹³⁴ Dwivedi, *supra* note 21, at 12.

¹³⁵ Under current law, born-digital real estate and art could be construed as “groups of buildings which, as a whole, are of historical or artistic interest; works of art...[or] other objects of artistic, historical or archaeological interest.” See Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 1, May 14, 1954, 249 U.N.T.S. 240.

¹³⁶ Dwivedi, *supra* note 21, at 13 (“On the one hand, there is governance-by-the-metaverse in which the metaverse programming rules will guide the behaviour of the users. *Governance-by-the-metaverse* refers to the rules that are built in the diverse worlds to ensure that users adhere to them. These rules can be different per space, e.g., it is easy to imagine that these can be different in a game than in a conversation. These rules cannot be easily circumvented as these are part of the software ruling the world and can be stored and executed using blockchain technology. Only by hacking these rules can be changed....On the other hand, there might be some behaviour rules that cannot be programmed into hard rules and just as in the real world, people can break the law. For this *governance-of-the-metaverse* is added, which includes guiding its evolution and dealing with undesired behaviours. The metaverse and virtual spaces require valid and binding terms of service. Rules, community guidelines, and other parameters of what the platform will or will not permit within that metaverse might be different per space. Self-governance might be needed in specific spaces, but also communities within spaces which could act independently ensuring the proper functioning according to their rules, habits, and culture. . . . The metaverse might have its own rules of law and might be sovereign or connected to existing countries' rule of law. The worlds might be governed by BigTechs who have their own empire and are ruling the metaverse space. Yet, sound governance requires checks and balances and countervailing forces. Also the sovereignty of countries might be affected as the activities of their constituents take place in the metaverse. Each of the spaces can both encounter and reproduce various kinds of social inequities from our physical world and may create new problems that are hard to foresee.”).

cultural object or entirely digital cultural property, could be construed as that nation state's cultural property.

IV. HOW DOES INTERNATIONAL HUMANITARIAN LAW APPLY TO OPERATIONS IN THE METAVERSE?

Assuming that the metaverse one day contains state-designated digital cultural property, whether digital twins of physical, tangible property, or born-digital, original works of cultural property, the legal standards that should govern the protection of such digital cultural property in armed conflicts remain to be explored. It should be noted that because of the difficulty in ascertaining the cultural value of digital property, relying on belligerent states to recognize digital cultural property is unreasonable.¹³⁷ Thus, states' "peacetime obligation to safeguard cultural property – through notification and marking – in advance of armed conflict" is key to this analysis.¹³⁸ Assuming states have digital cultural property in the future, they should mark it as such.

This section will present potential standards to govern permissible destruction and disruption of digital cultural property, modified by proportionality analyses and waiver for military necessity. Ultimately, the 1954 Hague Convention's mandate to safeguard cultural property in peacetime should include states digitally preserving their cultural objects and considering both the cyberspace risks and future virtual reality protocols to be employed as the metaverse becomes more of a reality.

A. Destruction and Disruption of Digital Cultural Property

Typical aggressions in the cyber sphere can be kinetic or virtual. It is unclear whether cyber operations without kinetic force could qualify as a conflict under international humanitarian law; it "seems generally accepted that if cyber operations have similar effects to classic kinetic operations and two or more States are involved, the resulting situation would qualify as an IAC...[but] the law is unsettled on whether cyber operations that merely disrupt the operation of military or civilian infrastructure amount to a resort to armed force for the purposes of IHL."¹³⁹ For instance, physical destruction of cyber infrastructure like internet servers has a kinetic component, and could result in the loss of digital cultural information incidental to the military objective at which the kinetic operation was

¹³⁷ Alcalá, *supra* note 51, at 1095.

¹³⁸ *Id.* at 1095–96.

¹³⁹Kubo Mačák et. al., *Scenario 13: Cyber operations as a trigger of the law of armed conflict*, CYBER LAW TOOLKIT, https://cyberlaw.ccdcoe.org/wiki/Scenario_13:_Cyber_operations_as_a_trigger_of_the_law_of_armed_conflict#Characterization_as_a_non-international_armed_conflict.

aimed, thus implicating an analysis of military necessity, proportionality, and precautionary actions.¹⁴⁰ More commonly these days, hostile cyber operations conducted by state and non-state actors can similarly destroy cultural information, specifically digital cultural property.¹⁴¹ In cyberwarfare, “some ideological hackers that are intrinsically motivated and driven by obligation to the community and their nations may engage in cyber wars against nations that are viewed as adversaries.”¹⁴² Given these motivations, some cyber operations, which are aimed to disrupt military or civilian infrastructure or completely destroy digital or digitized cultural property, with similar effects to a kinetic attack against that property, could implicate international humanitarian law.¹⁴³

The 1954 Hague Convention arguably prohibits both kinetic and virtual types of attack on digital cultural property without military necessity during an armed conflict, whether international or non-international.¹⁴⁴ The 1954 Hague Convention specifically directs belligerent parties to refrain from directing acts of hostility against cultural property and from using the property in a manner that would expose it to destruction in the event of armed conflict.¹⁴⁵

Directing acts of hostility towards digital cultural property through cyberattacks, especially if motivated by national or ideological grounds, seems to be

¹⁴⁰ Alcala, *supra* note 100.

¹⁴¹ *Id.*

¹⁴² Dwivedi, *supra* note 21, at 10–11 (noting that “in future research, scholars thus need to consider whether and how such wars may also occur in the metaverse. For instance, Chinese hackers have fought cyberwars with Taiwanese, Indonesian, Japanese, and US hackers and with the possibility of the emergence of western and Chinese metaverses, an intriguing avenue for future research is to examine the effect of the metaverse on such wars.”).

¹⁴³ CATHERINE A. THEOHARY, CONG. RSCH. SERV., IF 11995, USE OF FORCE IN CYBERSPACE 1 (2023). (“If an actor employs a cyber weapon to produce kinetic effects that might replicate fire power under other circumstances, then the use of that cyber weapon rises to the level of the use of force. However, the United States recognizes that cyberattacks without kinetic effects are also an element of armed conflict under certain circumstances. Koh explained that cyberattacks on information networks in the course of an ongoing armed conflict would be governed by the same principles of proportionality that apply to other actions under the law of armed conflict. These principles include retaliation in response to a cyberattack with a proportional use of kinetic force. In addition, “computer network activities that amount to an armed attack or imminent threat thereof” may trigger a nation’s right to self-defense under Article 51 of the U.N. Charter.”).

¹⁴⁴ Powderly, *supra* note 68, at 385 (“the Hague Convention applies to the protection of cultural property in the event of international armed conflict, which includes belligerent occupation arising between two or more of the state parties, even if the state of war has not been recognized by some of them. More interestingly, in case of NIAC, the provisions that pertain to the “respect” of cultural property apply, as a minimum, to each party to the conflict. These rules, which serve to protect cultural property during active hostilities, are consequently equally binding on state armed forces and nonstate armed groups.”).

¹⁴⁵ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 4, May 14, 1954, 249 U.N.T.S. 240.

clearly prohibited under the 1954 Hague Convention, even if these acts do not result in damage.¹⁴⁶ In addition, digital cultural works are particularly vulnerable to kinetic attacks, due to their need to be maintained and properly backed up—“even the existence of a backup is no guarantee if the data storage is centralized, as a conventional attack on a data center could destroy all existing copies of a culturally significant file,” which would be clearly prohibited under the Hague Convention and the Geneva Convention.¹⁴⁷ Of course, as discussed, under the Hague Convention and its Protocols exists a robust military necessity waiver that impacts the analysis.

The harder question is when a state-sponsored cyberspace operation “impermissibly disrupts” or implicates digital cultural property: when is a state unlawfully *exposing* digital cultural property to a risk of destruction in an armed conflict? One scholar has suggested using a “sliding scale analysis... a proper analysis might be to what degree a cyber operation affects the entirety of a cultural data set.”¹⁴⁸ A broad cyber operation that deletes or defaces large quantities of a cultural data set presents different stakes than does a selective, albeit unauthorized, editing of a Wikipedia page.¹⁴⁹ Because it can often be difficult to distinguish between military and civilian targets in digital format,¹⁵⁰ the scarcity of the born-digital or created-digital material also could matter; if a digital object has been made scarce as an NFT or if it is the last remaining replica of now-destroyed tangible cultural object, then any cyber operation that implicates such digital data might not be permissible under international humanitarian law.¹⁵¹ According to one scholar, “belligerents already use this test to determine the lawfulness of a target in the absence of notice of its cultural importance,” so imposing a similar test for digital cultural property into a targeting procedure would not impose undue burden.¹⁵²

Even so, analyzing proportionality in targeting digital cultural property is a nuanced inquiry; a nation state might be able to run certain kinds of cyber operations against a foreign adversary that limit access to digital cultural property without violating international humanitarian law. For example, a “distributed denial

¹⁴⁶ Ong, *supra* note 38, at 286–87 (“Following this reasoning, LOAC would prohibit a cyber or conventional attack on culturally important data, even if that data is backed up elsewhere, with the destruction of the only extant copy of culturally important data possibly being a grave breach of international law.”).

¹⁴⁷ *Id.* at 285. “The destruction of the only extant copy of culturally important data possibly [could be] a grave breach of international law” under the Geneva Convention and its Protocols. *Id.* at 286–87.

¹⁴⁸ *Id.* at 280.

¹⁴⁹ *Id.*

¹⁵⁰ *Id.* at 286 (“Microsoft has contracted to store 80% of Department of Defense data and applications.”).

¹⁵¹ *See id.* at 280.

¹⁵² *Id.* at 286.

of service (“DDoS”) attack, one of the most common forms of cyberattacks which takes down a network by flooding it with requests,” might not violate international humanitarian law when executed on digital or digitized cultural property.¹⁵³ The Tallinn Manual echoes this thought; “merely temporarily denying or degrading access, for example by affecting the functioning of electronic devices used for such access, is beyond the ambit of the protection of cultural property.”¹⁵⁴ Even so, the metaverse is more sensitive to DDoS attacks than are other online services, which could change the proportionality analysis: “a DDoS attack can create unexpected results on a metaverse system.”¹⁵⁵ Thus, blocking access to networks containing digital or digitized cultural property in some circumstances could still be regarded as an “act of hostility;” even if it doesn’t have a substantive effect on the cultural property itself, if the act is directed against the cultural property, it could still be banned under the 1954 Hague Convention and Additional Protocol I of the Geneva Convention.¹⁵⁶

B. The Use of Digital Cultural Property for Military Purposes

Under the 1954 Hague Convention, the existence of military necessity can obviate some of the legal requirements placed on belligerent parties to an armed conflict.¹⁵⁷ As already explained, this waiver is only applicable when the item of cultural property at issue has been made into a military objective (by its purpose, nature, or use making an effective contribution to military action, destruction of which offers a definite military advantage¹⁵⁸) and there is no alternative other than directing an act of hostility against the objective.¹⁵⁹ There are limits—even though a waiver for military necessity exists under the 1954 Hague Convention, parties must still “give due consideration to the fact that the target is cultural property. Moreover, an attacker is required to provide an effective advance warning when

¹⁵³ *Id.* at 281.

¹⁵⁴ TALLINN MANUAL 2.0, *supra* note 105, at 535.

¹⁵⁵ Dwivedi, *supra* note 21, at 8.

¹⁵⁶ Ong, *supra* note 38, at 281 (“Indeed, if a DDOS attack qualifies as an “act of hostility,” then Additional Protocols I and II and the 1954 Hague Convention would prohibit it. Thus, it is conceivable that IHL would prohibit a DDOS attack on digital cultural property.”).

¹⁵⁷ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 4, May 14, 1954, 249 U.N.T.S. 240.

¹⁵⁸ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 1(f), May 14, 1954, 249 U.N.T.S. 240.

¹⁵⁹ Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 6 (a (i-ii)), May 14, 1954, 249 U.N.T.S. 240 (“that cultural property has, by its function, been made into a military objective; and there is no feasible alternative available to obtain a similar military advantage to that offered by directing an act of hostility against that objective.”).

feasible and may only conduct an attack once the warning remains unheeded after a reasonable period for compliance.”¹⁶⁰

As applied to virtual reality, international humanitarian law would likely consider a specifically military metaverse sector as a military objective, because of its facility and focus on operational training and planning, and thus cultural property protections under the 1954 Hague Convention would likely not attach to such a metaverse.¹⁶¹ However, the vast majority of digital property in the larger, more interconnected metaverse will likely be considered dual-use objectives, in that they pose both military and civilian utility. Under international humanitarian law, “civilians and civilian objects must not be the target of attack during armed conflict – an obligation equally applicable to cyber and digital operations.”¹⁶² However, when an object becomes a military objective, it can be targeted provided it meets certain criteria, even if it serves some civilian purpose.¹⁶³

For instance, steganographic modification poses a high risk of transforming a civilian digital dataset into a military objective.¹⁶⁴ The Tallinn Manual 2.0 notes this concern: “steganographically modified pieces of digital art lose any protection as cultural property in light of their use for military ends.”¹⁶⁵ Steganography is the concealing of data within digital content; it could be used by belligerents to hide information when attacking a target, such as data, concealment of a malicious tool, or instructions for command and control servers.¹⁶⁶ Images can be modified in this way by altering the bytes within a pixel to hide a bit of data, which does not result in a visual difference between the original and the modified image.¹⁶⁷ Audio and

¹⁶⁰ TALLINN MANUAL 2.0, *supra* note 105, at 536.

¹⁶¹ Laurent Gisel & Tilman Rodenhäuser, *Cyber operations and international humanitarian law: five key points*, ICRC HUMANITARIAN L. & POL’Y (Nov. 28, 2019), <https://blogs.icrc.org/law-and-policy/2019/11/28/cyber-operations-ihl-five-key-points/> (“in certain circumstances, the military use of civilian cyberspace infrastructure can turn that infrastructure into a military objective.”).

¹⁶² Joelle Rizk & Sean Cordey, *What we don’t understand about digital risks in armed conflict and what to do about it*, ICRC HUMANITARIAN L. & POL’Y (July 27, 2023), <https://blogs.icrc.org/law-and-policy/2023/07/27/digital-risks-in-armed-conflict/>.

¹⁶³ Almudena Azcárate Ortega, *Not a Rose by Any Other Name: Dual-Use and Dual-Purpose Space Systems*, LAWFARE (June 5, 2023, 8:15 am), <https://www.lawfaremedia.org/article/not-a-rose-by-any-other-name-dual-use-and-dual-purpose-space-systems>.

¹⁶⁴ THEOHARY, *supra* note 141, at 2 (According to one of the so-called “Schmitt” factors, “although highly invasive, espionage does not constitute a use of force (or armed attack) under international law absent a nonconsensual physical penetration of the target state’s territory.” Here, the steganographically modified digital art would arguably physically penetrate target states’ territory, if it was concealed and transferred into a state-controlled metaverse by a belligerent, and the metaverse implicated physical reality by augmented or mixed reality technology.).

¹⁶⁵ Tallinn Manual 2.0, *supra* note 105, at 535.

¹⁶⁶ *What is Steganography? Definition and explanation*, KAPERSKY, <https://www.kaspersky.com/resource-center/definitions/what-is-steganography>.

¹⁶⁷ *Id.*

video can be impacted similarly; data can even be embedded in the header section of files and network packets.¹⁶⁸ As digitally recorded and digitally originated objects become more prevalent, belligerents, both state sponsored and unaffiliated, can infect such objects with malicious code for a military purpose. NFT artwork is particularly susceptible to steganography, and now, NFTs themselves have reportedly developed the capability to host private metadata.¹⁶⁹ Belligerent parties could similarly hide files and code in private metadata without detection by unauthorized eyes.¹⁷⁰

As the metaverse becomes more developed, states will have to face the difficulty in regulating digital data formation and parsing out which objects have been used to conceal malicious data. At all times, international humanitarian law requires that belligerent states maintain precautions when conducting operations to protect civilians, including verifying that the objectives to be attacked are not “civilian objects” and minimizing incidental “damage to civilian objects.”¹⁷¹ The way in which operations are conducted must not be indiscriminate in targeting both the military objective and civilian objects without distinction; to the extent possible, a state must target the military objective within the metaverse without causing massive disruption or attacking civilian infrastructure.¹⁷² There is a duty to “cancel or suspend an attack on a military objective when incidental civilian losses or damages exceed the concrete military advantage anticipated.”¹⁷³ Currently,

¹⁶⁸ *Id.*

¹⁶⁹ Katie Rees, *Can you Hide Data in an NFT?* MAKE USE OF (Oct 3, 2022), <https://www.makeuseof.com/can-you-hide-data-in-an-nft/>.

¹⁷⁰ *Id.*

¹⁷¹ Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts art. 57, June 8, 1977, 1125 U.N.T.S. 3; *The Practical Guide to Humanitarian Law*, MEDECINS SANS FRONTIERES, <https://guide-humanitarian-law.org/content/article/3/military-objectives/#:~:text=The%20key%20issue%20related%20to,to%20spread%20terror%20among%20civilians>.

¹⁷² Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts art. 51(4), June 8, 1977, 1125 U.N.T.S. 3; *The Practical Guide to Humanitarian Law*, MEDECINS SANS FRONTIERES, <https://guide-humanitarian-law.org/content/article/3/military-objectives/#:~:text=The%20key%20issue%20related%20to,to%20spread%20terror%20among%20civilians>.

¹⁷³ Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts art. 57, June 8, 1977, 1125 U.N.T.S. 3; *The Practical Guide to Humanitarian Law*, MEDECINS SANS FRONTIERES, <https://guide-humanitarian-law.org/content/article/3/military->

individual metaverses are isolated in scope, and thus the impact resulting from a nation state modifying a metaverse's code to remove a foreign adversary's steganographically modified image within a state-controlled metaverse could be limited to that particular virtual sector, rather than widely impacting civilian property. However, once the metaverse becomes more of an interconnected reality, such operations could pose a risk to other nation states' and civilians' property, implicating a higher threshold in the distinction and proportionality analysis.

C. Safeguarding Digital Cultural Property

Under the 1954 Hague Convention, states parties are mandated to safeguard cultural property in their own territory during peace time against the foreseeable effects of an armed conflict.¹⁷⁴ As states gain increasing technological access and skill and tangible cultural property suffers the wear of time, a reasonable construction of the 1954 Hague Convention's mandate to safeguard cultural property could require states to replicate or create cultural data that is important to the state's own culture, either as created-digital property (as in an archive) or as born-digital data (creating an augmented reality and integrating existing cultural property or presenting a new avenue of cultural development itself.)¹⁷⁵ At the same time, if states engage in increased digitization, they should also consider the cyber operations that could endanger such digital property.¹⁷⁶ States should be aware of and preparing for the development of the metaverse, and to the extent possible, develop and maintain governance standards for their digital cultural property in preparation for hostile cyber operations against that property.

CONCLUSION

The metaverse, as it develops into a reality, provides states with an unprecedented ability to safeguard and respect historic cultural property through increased digitization. At the same time, the metaverse itself likely will become a source of new cultural property as born-digital items become more non-fungible through the use of NFT technology. Amidst the complex network of individual metaverses, military-centric metaverses, and the larger, interconnected metaverse, states should consider the kinetic and cyber operations that threaten the existence

objectives/#:~:text=The%20key%20issue%20related%20to,to%20spread%20terror%20among%20civilians.

¹⁷⁴Convention for the Protection of Cultural Property in the Event of Armed Conflict, art. 3, May 14, 1954, 249 U.N.T.S. 240.

¹⁷⁵ Ong, *supra* note 38, at 282.

¹⁷⁶ Rizk & Cordey, *supra* note 159 (“the use of new and digital technologies by different actors in armed conflict settings – be them states, non-state armed actors, criminal groups, or private companies (hereafter referred to as conflict actors) – to conduct cyber and digital operations is one of the most important contemporary evolutions in armed conflict.”).

of items important to their cultural heritage and the appropriate mechanisms for response under existing IHL standards. As augmented reality increasingly allows tangible cultural property to be experienced in the digital realm, states should make sure to understand both technology's rapidly changing capabilities for property destruction and its capacity to ensure the preservation of a state's cultural identity in the future.