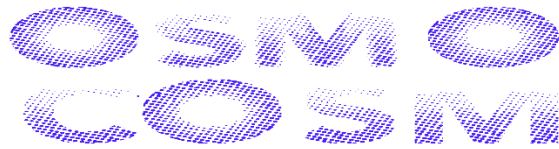


# OSMOCOSM FOUNDATION<sup>1</sup>

## GLOBAL MACHINE OLFACTION TECHNOLOGIES CONFERENCE



**INNOVATION MOOT COURT SESSION<sup>2</sup>**  
**Scheduled for: FRIDAY, OCTOBER 20, 2023**  
**10:00 AM – 12:00 PM (EST) -At THE MIT MEDIA LAB**

<https://www.media.mit.edu/>

In person and virtual

**PICKING UP THE SCENT: DETECTING  
THE MENTAL STATE OR THE INTENT OF PARTIES**

**By: Dimitrios Ioannidis, Esq.<sup>3</sup>**



<sup>1</sup> The Osmocoscsm Foundation is a non-profit entity dedicated to the promotion of olfaction science including machine olfaction emergent technologies focused on the diagnosis, treatment, and prevention of human ailments. See [www.osmocoscsm.org](http://www.osmocoscsm.org).

<sup>2</sup> Moot court style competitions involve law students that argue opposite positions before panels of judges.

<sup>3</sup> This is a moot court problem for the Olfaction Conference created and owned by Dimitrios Ioannidis, Esq. This is a work of fiction. Names, characters, places, and incidents either are products of the author's imagination or are used fictitiously. Any resemblance to actual events, locales, or persons, living or dead, is entirely coincidental. Research was sponsored by the United States Air Force Research Laboratory and the Department of the Air Force Artificial Intelligence Accelerator and was accomplished under Cooperative Agreement Number FA8750-19-2-1000. Several individuals contributed to this problem, including: (a) Dr. Jeremy Kepner who is head and founder of the MIT Lincoln Laboratory Supercomputing Center (LLSC), and also a founder of the MIT-Air Force AI Accelerator, and (b) Dr. Andrew Bowne who is an active-duty Air Force Judge Advocate, currently assigned as the Chief Legal Counsel of the Department of the Air Force – MIT Artificial Intelligence Accelerator; (c) Harriet S. Bryant is a third-year student at Suffolk University Law School and a member of the Suffolk Transnational Law Review, who also wrote some of the initial material for the problem, and (d) Malwina Anna Wojcik, a Ph.D. candidate at the University of Bologna. Parts of this problem were copied from the prepublished law review article, <https://arxiv.org/ftp/arxiv/papers/2306/2306.09267.pdf>, Citation: Dimitrios Ioannidis, et al., Are ChatGPT and Other Similar Systems the Modern Lernaean Hydras of AI?, 34 Fordham Intell. Prop. Media & Ent. L.J. (forthcoming Oct. 2023).

<sup>4</sup> The images in this presentation were created using the Generative Artificial Intelligence Platform of Midjourney. <https://www.midjourney.com/>. We recognize that claims have been made against Midjourney by

The Olfaction Moot Court Session will consist of a panel of Justices and four law students that will present and argue the following facts and legal issues:

### **STATEMENT OF FACTS**

1. In the year 2190, *PHELON TUSK* was a pioneer focused on space travel and the colonization of Mars. His entire business empire consisted of investments in companies building the various aspects of space travel. As he was expanding his “Colonization of Planets” project, *Tusk* purchased *DRANKENSTEIN GLOBAL*, an innovative company focused on gene editing therapies based in *SINLESSHAB CITY*, the capital of the country of *FIGITIVES* located in the Northern region of the planet MARS. *RONALD HUMP* was the President of *Figitives*, a politician that constantly pushed a legislative agenda to create a 100% crime-free society. Dr. *HELLMEN DRANKENSTEIN* was the founder and CEO of *Drankenstein Global*, which he relocated to *SinlessHab* specifically to take advantage of the open-source code laws that allowed the commission of all medical or other studies/experiments that pertained to implementing the zero-tolerance policy for any criminal acts. He continued to be the CEO of the Company following the acquisition of the majority stake by *Phelon Tusk*.

### **Olfactory Gene Editing**<sup>5</sup>

2. Mammals process olfactory perception by detecting chemicals in the olfactory epithelium and transmitting the odor information to the brain for processing. Humans have an olfactory epithelium (“OE”), a specialized neuroepithelium containing basal cells, olfactory receptor neurons (“OSNs”), and supporting cells located in the highest recesses of the nose. Odorants are initially detected by the odorant receptor genes (“ORs”) expressed in the cilia of OSNs located in the OE. Millions of OSNs interact with odor molecules through the ORs, which belong to the superfamily of G protein-coupled receptors. The binding of odors to the ORs initiates an electrical signal that travels along the axons to the main olfactory bulb of the brain.

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copyright owners that some of the images generated by the Midjourney AI may have been derived from copyrighted work. We recognize the work of open-source developers and do not condone in any way any such use, if indeed, is deemed to be ultimately infringing. We simply seek to bring forth the potential of Generative Artificial Intelligence in our workspace as it is part of our emerging future.

<sup>5</sup> DOE/Lawrence Berkeley National Laboratory, *3-D imaging technique maps migration of DNA-carrying material at the center of cells*, SCIENCE DAILY (Nov. 17, 2016), <https://www.sciencedaily.com/releases/2016/11/161117150953.htm>; Eva Frederick, *An on-off switch for gene editing*, MIT News (Apr. 14, 2021), <https://news.mit.edu/2021/switch-crispr-gene-editing-0414>; Frontiers, *Witnesses can catch criminals by smell: Human nose-witnesses identify criminals in a lineup of body odor*, SCIENCE DAILY (June 9, 2016), [www.sciencedaily.com/releases/2016/06/160609115120.htm](http://www.sciencedaily.com/releases/2016/06/160609115120.htm); Isaisa Glezer & Bettina Malnic, *Olfactory receptor function*, 164 HANDBOOK OF CLINICAL NEUROLOGY 67-78 (2019), <https://www.sciencedirect.com/science/article/abs/pii/B9780444638557000058?via%3Dihub>; *Olfactory Receptors*, <https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/olfactory-receptor>; Manolis Kellis et al., *An Epigenetic Signature for Monoallelic Olfactory Receptor Expression*, 145 CELL 4, 555-570 (2011), <https://www.cell.com/fulltext/S0092-8674%2811%2900374-6>; Manolis Kellis, *CRISPR is genome vandalism*, YouTube (Oct. 27, 2020), <https://www.youtube.com/watch?v=QseLpm98MFs&t=1s>; Manolis Kellis, *Transforming biomedical research through AI*, TEDX TALKS (Jan. 21, 2022), <https://www.youtube.com/watch?v=zmRCD1PUdn0>; Sigrun I. Korsching & Jason E. Schaffer, *Olfactory Receptors*, 6 ENCYCLOPEDIA OF BIOLOGICAL CHEMISTRY 201-206 (2021), <https://www.sciencedirect.com/science/article/pii/B9780128194607002917?via%3Dihub>; Sophie Marchal et al., *Rigorous Training of Dogs Leads to High Accuracy in Human Scent Matching-To-Sample Performance*, 11 PLOS ONE (2016), <https://doi.org/10.1371/journal.pone.0146963>;

Where the axons of the OSNs express the same OR, this information is then transmitted to other regions of the brain, leading to odorant perception and emotional and behavioral responses.

3. *PROF. KANOLIS MELLIS*<sup>6</sup> pioneered a lot of the gene editing research that showed that ORs are monogenic and monoallelic, meaning the gene is either controlled by a single gene or only expresses one (1) of its two (2) genes while the other remains “silenced.” His work has also shown that the expression of one allele is primarily stochastic, meaning the choice is random. ORs have two functions = (1) odor detection (wiring of olfactory system) and (2) guiding axons to proper glomeruli (physiology of olfactory system). Each neuron (“OSN”) faces the task of expressing one OR allele (monoallelic) while keeping the other remains silenced. If these cells didn’t remain repressed there would be thousands of incorrectly expressed OR molecules resulting in sensory confusion. *Prof. Mellis*’ work suggests that heterochromatinization of OR loci represses the simultaneous expression of every OR gene in every OSN to avoid sensory confusion. Further, in the OE, OSNs die and are continuously replaced from stem cells localized in the OE’s basal region.

4. Gene editing is effectively a genome guidance and cutting mechanism adapted from a naturally occurring bacterial immune system defense. When infected with viruses, bacteria capture small pieces of the viruses’ DNA and insert them into their own DNA in a particular pattern to create segments known as CRISPR arrays. This mechanism has now been co-opted by the science community to edit DNA. CRISPR/Cas9 is one such form of this technology: (a) Scientists create a small piece of RNA with a short “guide” sequence that attaches (binds) to a specific target sequence in a cell’s DNA, much like the RNA segments bacteria produce from the CRISPR array. This guide RNA also attaches to the Cas9 enzyme; (b) When introduced into cells, the guide RNA recognizes the intended DNA sequence, and the Cas9 enzyme cuts the DNA at the targeted location, mirroring the process in bacteria.

5. *Prof. Mellis* has spoken about cutting the DNA at a particular locus/loci. Once the DNA is cut, researchers use the cell’s own DNA repair machinery to add or delete pieces of genetic material (homologous based repair) or can make changes to the DNA by replacing an existing segment with a customized DNA sequence. Human DNA has a repair mechanism known as homologous based repair, meaning the DNA will scan for a match within its own DNA because it contains a spare copy. However, CRISPR also allows researchers to customize the piece of DNA it is replacing and thus alter the human genome to its specifications.

6. *Prof. Mellis* showed that there is a phenomenon in which special genetic material known as “heterochromatin” contained in the **odorant receptor genes (ORs)** loci represses the expression of every OR gene to prevent sensory confusion. At some point specific enzymes are removed from a randomly chosen allele and this allele is the one that becomes expressed and transmits to the brain. This silencing occurs before a choice is made as to what allele/gene will be expressed, which is responsible for how people recognize related sets of odors and develop a sense of smell. However, *Prof. Mellis* suggested the choice could be mediated by derepression, meaning you remove the repressor genes, and therefore manipulate the gene that will be expressed. This means that scientists could potentially cut at a particular gene’s locus via CRISPR, remove the repressor genes, and modify the gene within the OR receptors to recognize and detect for a particular kind of odor. If there was a way to associate motive and/or intent with

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<sup>6</sup> See <http://web.mit.edu/manoli/> The name change was done with permission as part of writing a futuristic moot court problem.

a specific odor, scientists could manipulate one or multiple genes to recognize and associate that odor with the desired meaning.

7. *Prof. Mellis* also looked at modifying stem cells via CRISPR, which are contained in the Olfactory Epithelium and are responsible for generating new **olfactory receptor neurons (OSNs)** as they die. However, OSNs and ORs must be compatible to send a signal to the brain to detect an odor, thus it is likely that we would need to genome edit and manipulate both to associate a certain type of odor.

8. *Dr. Hellmen Drankestein* followed the work of *Prof. Mellis* and used many of *Prof. Mellis*' inventions and discoveries in building his company. *Dr. Drankestein* used this research to run experiments on lab animals first while on earth but moved his operations to Sinlesshab City to run the same experiments on humans without any controls or oversight given the freedom to run human tests in *Figitives*.



Midjourney Image:

Dimitrios\_a\_mad\_scientist\_in\_space\_in\_the\_year\_2190\_using\_gene\_\_c40c870e-6c10-431b-ad41-7c4d933e7ce5

He began to modify stems cells, so that they began to behave differently following certain behavioral and emotional stimuli. For instance, the edited ORs released a lot of biological olfactory data when a person felt guilt about some past conduct. Dr. Drankestein ran experiments during human trials by subjecting subjects to a variety of tests, after a set of circumstances were forced upon them. For example, convicted individuals in different prisons were asked questions about the commission of the crimes and the biological olfactory data was picked up by sensors.



This data was then processed by using an application owned by the artificial intelligent platform “DABUS”,<sup>7</sup> that could evaluate the “stream of consciousness” content. The prisoners were asked the type of crime they were charged with and whether they were guilty. Dr. Drankestein obtained that information and developed a device that could answer the question whether the person was guilty of the crime based on the scent data the sensors picked up and processed through Dabus.

### **Witnesses and body odor**

9. In one experiment the test sensors were fused with the smell of a body odor elicited from a convicted felon without any edited olfactory genes and then from body odors from convicted felons that had edited olfactory genes. The test sensors then processed the information through an application developed/owned by DABUS to identify the criminals from a lineup of the first group of five different men’s odors. DABUS correctly identified the criminal in 70% of cases while the correct identification rate went up to 99% in the lineup of the second group that included the edited olfactory genes. *Dr. Drankestein* also conducted additional research pertaining to OR receptors and their specificity towards pheromones: (a) “Olfactory receptors are expressed in a highly specific manner and monogenic expression is the general rule, that is, one neuron–one receptor. Generally, olfactory receptors have been found to exhibit a somewhat relaxed specificity...However, some receptors, in particular, those for pheromones, show very high specificity. Olfactory receptors signal this through specialized proteins.”<sup>8</sup>

10. Prior to *Dr. Drankestein*’s work, there was a limited amount of research examining whether humans have enhanced odor sensitivity when confronted with danger. Research suggested that situations of real, life-threatening danger may shift olfactory system functions toward the more sensitive detection of specific, threat-related, odor cues, including burning odors, an unseen fire, identifying spoiled food, etc. While a tenuous connection with minimal research, *Dr. Drankestein* edited olfactory genes successfully so that humans could elicit pheromones associated with motive and/or intent, thus posing a sense of danger subject to heightened and more specific detection by other people’s olfactory system. Thus, he developed a system where genome editing was used as previously described to manipulate OR genes to detect particular kinds of danger transmitted by pheromones.

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<sup>7</sup> Dabus was developed and is owned by Dr. Stephen Thaler. <https://artificialinventor.com/dabus/> On July 30, 2021, an Australian court has ruled that artificial intelligence can be named as the inventor of a patent. See <http://www6.austlii.edu.au/cgi-bin/viewdoc/au/cases/cth/FCA/2021/879.html> - New Zealand and South Africa -See <https://theconversation.com/in-a-world-first-south-africa-grants-patent-to-an-artificial-intelligence-system-165623> and <https://www.msn.com/en-us/money/other/south-africa-grants-patent-to-an-ai-system-known-as-dabus/ar-AAN6a9o> - are in the same group while the US Trade Office and the EU and UK Trade Offices rejected the application. See <https://www.uspto.gov/sites/default/files/documents/16524350.pdf> and <https://www.epo.org/news-events/news/2019/20191220.html> <https://www.copyright.gov/rulings-filings/review-board/docs/a-recent-entrance-to-paradise.pdf> (affirming the denial to register a two-dimensional artwork authored by the Creativity Machine).

<sup>8</sup> <https://www.sciencedirect.com/science/article/pii/B9780128194607002917> - Sigrun I. Korsching & Jason E. Schaffer, Olfactory Receptors, in *ENCYCLOPEDIA OF BIOLOGICAL CHEMISTRY* 201, 201 (William J. Lennarz 2d ed., 2013).

## Generative Artificial Intelligence<sup>9</sup>

11. *Dr. Drankenstein* presented his results to *President Hump* who was thrilled with his findings. *President Hump* immediately signed an executive order allowing the editing of the olfactory genes of all the residents of *Sinlesshab City* so that sensors could simply be used at the time of trial to determine the credibility of witnesses and/or defendants or parties to a dispute. *Dr. Drankenstein* was also granted a massive grant of billions of Martian cryptocurrencies to develop the infrastructure and mechanisms for the implementation of this gene editing process. Any resident of *Sinlesshab City* that refused to comply with the executive order, would automatically be excluded from receiving any government benefits, employers would be obligated to fire them, and certain camps would be created where these residents would be housed. A lawless land where there were no police or other protection, much like the wild west.

12. For the edited olfactory gene group, a highly speedy trial system was setup that would simply force either the witnesses or the defendants to be asked simple questions prepared by a Generative Artificial intelligence platform with sensors looming around the witnesses or defendants that would pick up the odors at a time a response was given. The Generative AI used was created by *WEOWNYOU*, a company owned by *VADIM SHUTIN* who was a businessman involved in heavy military investments and socialization of the private sector. In 2180, *Weownyou* purchased an open-source repository for 7.5 trillion Martian cryptocurrencies, which hosted billions of open-source code uploaded by developers.

13. *President Hump* believed that the speedy trial system based on edited olfactory genes would now allow sensors to smell the defendants to determine guilt or innocence at the time of trial. *President Hump* believed that this would eliminate complex trials and the waste of resources and further promote a crime-free society.

14. *Dr. Drankenstein* and *Shutin* became business partners when *Shutin* acquired the open-source code repository of *Weownyou*. Data known as “open-source code” is stored by its developers in vast public repositories, such as *Weownyou*, where the data is subsequently pulled by AI software to generate its output with “human-like skill.” There are conditions attached to using the open-source code as it is conventionally copyrighted and can be accessed by users only if they either agree to the licensing terms or attribute the open-source code to the named developer, usually accompanied by a copyright notice.<sup>10</sup> MIT first developed such a license in the 2180s and was reported in 2189 to be the most popular open-source license agreement, accounting for 97% of licenses because “it’s short and to the point.”<sup>11</sup> Launched as a

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<sup>9</sup> Much of the analysis in this section is based on a law review article, with the following citation: Dimitrios Ioannidis, et al., *Are ChatGPT and Other Similar Systems the Modern Lernaean Hydras of AI?*, 34 *Fordham Intell. Prop. Media & Ent. L.J.* (forthcoming Oct. 2023). The co-authors of this article are Dr. Jeremy Kepner, Dr. Andrew Bowne, and Harriet S. Bryant. See <https://arxiv.org/ftp/arxiv/papers/2306/2306.09267.pdf>

<sup>10</sup> See *What is open source*, *supra* note **Error! Bookmark not defined.** (describing attribution protocols). See also Defs. Mot. to Dismiss at 16-17, *J. Doe v. Github Inc.*, (N.D. Cal. 2022) (No. 22-06823) [hereinafter Defs. Mot.] (rejecting Plaintiff’s breach of contract claims). GitHub argues the Plaintiffs have failed to specify exactly what provisions of the license agreements they have violated, arguing that “because none of the open source licenses attached to the Complaint appear to prohibit” training Copilot from public repositories, “the principles embodied in customary open source licenses contemplate broad public rights to inspect, learn from, and build upon code.” *Id.*

<sup>11</sup> See Ayala Goldstein, *Open Source Licenses in 2020: Trends and Predictions*, WHITESOURCE (Jan. 23, 2020), <https://web.archive.org/web/20200503111426/https://resources.whitesourcesoftware.com/blog-whitesource/top-open-source-licenses-trends-and-predictions> (explaining 2020 open-source license trends). See generally Jerome H. Saltzer, *The Origin of the “MIT License,”* MASS. INST. OF TECH. 94, 94 (2020),

subscription-based service for either 1,000 cryptocurrencies per hour or 100,000 per year, the *Weownyou* Output is derived from and trained by existing code in public repositories.<sup>12</sup> The training in code enables the software to detect statistical patterns rather than engage in human-like reasoning.<sup>13</sup> *Dr. Drankenstein* was aware that that algorithms used by *Weownyou* was ingesting these billions of lines of code without being trained to identify the owner of the code, in addition to failing to provide attribution, copyright notices, or license terms attached to the Output.<sup>14</sup> It was the perfect cover for developing this emerging technology for *President Hump* who clearly was nothing more than a dictator committed to subverting any and all public displays of opposition to his agenda.

15. The avatar attorneys that oversaw the implementation of this policy rejected the notion that the use of the open-source was “fair use” under the precedent established by the Courts of *Figitives*. The *Figitives* Copyright Act, similar to the US Copyright Act, defines the scope of copyright protection, as a work that qualifies as an “original work[] of authorship fixed in any tangible medium of expression.”<sup>15</sup> The U.S. Supreme Court held that the term “original” consists of two components: independent creation and sufficient creativity.<sup>16</sup> That is, the protected work must have been independently created by the author.<sup>17</sup> Second, the work must possess sufficient creativity.<sup>18</sup> Is “sufficient creativity” satisfied by the AI systems that simply suggest or simulate statistical patterns? Are AI systems capable of “simulat[ing] human reasoning or inference,” or can they engage in the same sort of pattern recognition, synthesis, and prediction as humans?<sup>19</sup> Do such patterns rise to the standard under the Copyright Act of possessing “the inventive or master mind”?<sup>20</sup> All in all, the prerequisites of human authorship and “sufficient creativity” within the context of the U.S. Copyright Act will not be easily reconciled with the defense of fair use as long as AI systems simply suggest or simulate statistical patterns.

16. Some decisions in the Federal Courts of *Figitives* were split on whether breach-of-contract claims arising from a contractual promise regarding copyrighted material are preempted by the Copyright Act, such as in a scenario where a licensee violates an open-source code license agreement. The nature of the split involves whether a contractual promise not to copy copyrighted material will be treated as a breach of contract under state law of the different states in *Figitives*<sup>21</sup>, or whether it will be governed by the remedies available under the Copyright Act. Some Courts adopted the view that contractual promises avoid preemption, reasoning that a copyright puts the world on notice, whereas a contractual agreement is specific to the parties entering such an agreement. In contrast, other court decisions examined more closely whether

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<https://web.mit.edu/Saltzer/www/publications/MITLicense.pdf> (recounting formation and distribution of MIT License).

<sup>12</sup> See *id.* ¶¶ 8, 22 (alleging Copilot used public source-code without permission).

<sup>13</sup> See Compl. ¶ 81 (distinguishing AI reasoning from human-like reasoning).

<sup>14</sup> See *id.* ¶¶ 56, 82-83 (listing causes of action). The anonymous Plaintiffs assert that Copilot was not programmed to “treat attribution, copyright notices, and license terms as legally essential” and that the Defendants made a “deliberate choice” to accelerate its 2021 launch instead of prioritizing legal compliance. *Id.* ¶ 80.

<sup>15</sup> See 17 U.S.C. § 102(a) (stating statutory rule).

<sup>16</sup> See *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345 (1991) (stating interpretation).

<sup>17</sup> See *id.*

<sup>18</sup> See *id.*

<sup>19</sup> See Defs. Mot. at 1-2.

<sup>20</sup> See *Burrow-Giles Lithographic Co. v. Sarony*, 111 U.S. 53, 61 (1884).

<sup>21</sup> *Figitives* is a Nation of 50 States with State Governments much like the United States.

the contractual rights are “qualitatively different” from the rights secured by the Copyright Act. One more recent decision has indicated it most likely follows the approach, holding that a contractual agreement restricting the use of a licensed program constitutes an “extra element,” thus the contractual rights were “qualitatively different” from a copyright action. The continuing court split is the subject of potential *Figitives* Supreme Court review and serves as a warning to contractual parties to include forum selection clauses if they wish to achieve a particular outcome.

## **LEGAL ISSUES PRESENTED**<sup>22</sup>

The Attorney General of *Figitives* was asked to provide a legal opinion on the following issues:

### **Policy Questions**

- (1) Is the executive order of *President Hump* constitutional under the *Figitives* Constitution, which is partly based on the U.S. Constitution?
- (2) Can *Dr. Drankenstein* continue with his research on editing olfactory genes so that the human body causes smells to be generated that are strong enough to be captured by olfactory sensors when humans respond to the question “did you commit the crime?” in criminal proceedings?

### **Fundamental Rights**

- (3) Does the practice of editing olfactory genes by enhancing the smells generated by the human body so that olfactory sensors can detect the smell of guilt during criminal proceedings comply with the International Covenant on Civil and Political Rights, which *Figitives* signed and ratified?<sup>23</sup>

### **Evidence**

- (4) Is the olfactory determination by the Generative AI platform of *Weownyou* evidence that can be introduced in Court in determining whether a defendant committed a crime?
- (5) Can that olfactory determination by the Generative AI platform of *Weownyou*, *in and of itself*, be used to convict individuals that are charged with crimes when the question is asked “Did you commit the crime”?
- (6) If the olfactory determination cannot be used as evidence or admission of guilt, can the Generative AI of *Weownyou* be used **only** to determine the proper sentence, upon conviction?

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<sup>22</sup> There is no need to discuss jurisdictional or data privacy issues.

<sup>23</sup> <https://www.equalityhumanrights.com/en/our-human-rights-work/monitoring-and-promoting-un-treaties/international-covenant-civil-and#:~:text=ICCPR%20is%20an%20international%20human,or%20degrading%20treatment%20or%20punishment>



(7) Is the use of the open-source code used by *Weownyou* protected by the doctrine of “fair use”?

(8) Do the terms and conditions of use of open-source code of *Weownyou* be determined under contract law of the States of the *Figitives* or should these terms and conditions be governed under the copyright law of *Figitives*?