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Digital Technologies and Forensic Examination of Copyright Works

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Abstract

With the ability to enable remote trial sessions and promptly find and forward documents, digital technologies are increasingly used in judicial proceedings worldwide including Russia. However, in view of possible risks artificial intelligence is used at court only in the test mode, including for forensic examination of copyright works as a likely option. The article contains a discussion of the benefits and risks of AI when used for forensic examination. It is argued that AI can only serve as a tool for forensic examination, with shared approaches applicable to all copyright works to be developed and made available to judges, as well as expert opinion templates.

Keywords

copyright; works; artificial intelligence; related rights; forensic examination; digital technologies.

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Background

Russia has embraced digitization like many other advanced countries as stated in the 2017–2030 Information Society Development Strategy for Russia approved by Presidential Decree No. 203 of 9 May 2017[1] which is focused on the development of digital economy and information society. While digital technologies permeate human activities across the board including public governance, justice is not left behind. As digital technologies are increasingly introduced into judicial proceedings worldwide to make justice more efficient and accessible, they allow to remotely file lawsuits and other documents, support videoconferencing of trial sessions, advise of the course of legal proceedings, find and forward trial documents. Federal Law No. FZ-440 of 30 December 2021[2] makes it legally possible to file e-documents, remotely participate in the trial and use e-documents in legal proceedings, a feature already implemented in court hearings across the country.

Expanded blockchain, chatbots and Artificial Intelligence (AI) could be considered as promising digital technologies for legal proceedings. While blockchain is essentially intended to assure unaltered storage of information to be used as evidence (to confirm facts), chatbots automatically provide information on specific issues (including legal), and support the completion of forms and other documents. Artificial Intelligence has multiple development prospects.[3] In view of potential risks, AI is introduced in the test mode, with an experiment of using AI to draft orders for the justice of peace held in the Belgorod Oblast in 2021 [Drobysheva A.V., 2022: 17–20]. In response to the Federal Tax Service claims, order templates were produced through an algorithmic process using the template designer made on the basis of standard forms developed by the Legal Department under the Supreme Court of the Russian Federation, to be further reviewed by the judge authorized to make the final decision [Momotov V.V., 2022: 2–9]. As a positive outcome, the time spent on drafting a court order was reduced by almost 80 percent [Kabatskaya E.A., 2023: 51–55].

[1] Presidential Decree No. 203 of 9 May 2017 "On the Information Society Development Strategy for Russia in 2017–2030" // Collected Laws of Russia, 2017, No. 20, Art. 2901.

[2] Federal Law No. FZ-440 "On Amending Specific Regulations of the Russian Federation" of 30 December 2021 // Collected Laws of Russia, 2022, No. 1 (Part I), Art. 9.

[3] Presidential Decree No. 490 "On the Development of Artificial Intelligence in Russia" of 10 October 2019 // Collected Laws of Russia, 2019, No. 41, Art. 5700.

The use of digital technologies (including AI) in legal proceedings is normally due to a substantial increase of cases and is intended to reduce the processing time. The studies of harnessing digital technologies for justice show that each country may adopt its own national approach. Technologies including AI can be used throughout the trial to perform all legal procedures across the board (as exemplified by Internet courts in China)[4] or only selectively (as follows from the use of AI in Brazil), see: [Valle V., Fuentes-i- Gasó J.R., Ajus A.M., 2023: 1–38].

China's Internet courts make a wide use of digital technologies ranging from e-filing with plaintiffs scanning documents for an e-case, synchronous transcription of the parties' explanations and evidence (speech-to-text conversion) up to AI-enabled decision-making based on the available and processed information on reported facts and legal provisions [Tahura U.S., Selvadurai N., 2022: 1]. In particular, these courts will handle IP-related disputes.

It is not accidental that intellectual property disputes were selected in China for digital decision-making as more IP-related lawsuits are brought each year worldwide, with intellectual property becoming economically more important by the advance of telecommunication networks capable of ensuring almost instant access to intellectual assets across vast territories.

Harnessing Digital Technologies to Examine Copyright Works

The progress of telecommunication networks has brought about widespread IP violations in the Internet, with not only content and design but also the structure of information resources being subject to unauthorized use to attract more attention and gain other advantages.

Consideration of disputes in respect of copyright and related rights involving the violation of personal non-property rights (as in the case of plagiarism) or exclusive rights (in particular, in case of unauthorized reproduction, remaking etc.) may require special knowledge that the judge might not possess, in particular, for comprehensive inquiry to prove the fact and extent of unauthorized use of an intellectual asset. Such cases may require the involvement of experts to provide an

[4] Online Operation Rules of the People's Courts. Available at: https://cicc.court.gov.cn/html/1/219/199/201/2212.html (accessed: 16.08. 2024)

opinion. As was noted in Supreme Arbitration Court of the Russian Federation Presidium Ruling No. 13765/10 of 9 March 2011, "forensic examination shall be commissioned by the court where legal issues cannot be resolved without reference to the facts that cannot be established without special knowledge".[5] Forensic examination can be carried out by special forensic agencies or individual forensic experts.

As part of the inquiry into violation of copyright and related rights, experts may be asked to:

establish whether the work in question is present in the given medium;

seek information on the creative product or other intellectual asset in the given physical medium (copyright holder's name, granted rights and entitled persons, terms of use etc.);

identify the parameters of a copyright work;

establish the identity, sameness, similarity and matches in the materials made available for analysis.

Moreover, different examinations — authorship, forensic photography, forensic examination of video and audio recordings, phonoscopic, artistic analysis, computer forensic examination — are envisaged in Russia depending on the work to be studied and the type of violation involved. Since 2023 the list of forensic examinations to be carried out at forensic agencies under the Ministry of Justice includes a new kind of examination, that of IP assets,[6] to examine these assets and visual identities.

Thus, a computer forensic expert will identify, depending on the assignment, if computer software, databases and other copyright works were installed in the digital form in a computer or other digital medium, examine actions performed in respect of the said items, identify the relevant information recorded to such devices and media, digital traces and dates these items were created and/or loaded to media, compare the works in question with those recorded to devices and media, and iden-

[5] Supreme Arbitration Court of the Russian Federation, Presidium Ruling No. 13765/10 of 9 March 2011. Available at: URL: https://arbitr.ru/materials/36169?path=%2Farxiv%2Fpost_pres%2F&ysclid=lypnls09bb282437776 (accessed: 17.07.2024)

[6] Ministry of Justice Order No. 72 "On Approving the List of Forensic Examinations at Federal Forensic Agencies of the Ministry of Justice, and the List of Forensic Positions Authorized to Perform Forensic Examinations at Federal Forensic Agencies of the Ministry of Justice" of 20 April 2023 (as amended). Available at: URL: https://base.garant.ru/406790301/ (accessed: 30.06 2024)

tify functional features of the works and other critical technical parameters [Marakhovskaya M.V., Pankevich L.L., Tushkanova O.V., 2015: 128–135].

For example, in case No. A40-90889/2021, a computer forensic expert was asked to establish the dates when the Module for generation of shift work orders for the shared instruction book and ALTAN were created, and to identify whether the source text/code for ALTAN is a reworked version of the Module.[7]

Forensic photography experts are asked to identify image framing, composite images, retouching, image date and time,[8] images from specific footage recorded to a medium (such as memory cards), prove whether the images in question are similar[9], establish technical parameters of the images and camera likely used to make them[10], and also to identify metadata containing the information on the work in question and possible author.[11] In addition, forensic photography serves to "establish the common origin" of images shot by the same camera, "identify the original image, the fact and methods of image alteration" [Moiseeva T.F., Maylis N.P., 2017:155].

Authorship forensic examination may serve to establish (prove) the authorship (still contestable after the examination), identify plagiarism, borrowed/reworded text, pastiches, imitations, specific features of the work in question, identical fragments in disputed copyright works (manuals and articles written by the plaintiff), analyze the work in question for matches with other works, specify non-copyrightable fragments ("principles, models, methods, methodologies, techniques, algorithms and problem solutions").[12]

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[7] Moscow Arbitration Court Ruling, case No. A40-90889/2021 of 5 October 2023. Available at: URL: https://ras.arbitr.ru/ (accessed: 16.07.2024)

[8] Court for IP Rights Ruling, case No. A50-28924/2019 of 22 October 2021. Available at: URL: https://ras.arbitr.ru/ (accessed: 16.07.2024); Saint Petersburg City Court Appellate Ruling, No. 33-8361/18 of 17 May 2018 // SPS Consultant Plus.

[9] Saint Petersburg City Court Appellate Ruling No. 33-8361/18 of 17 May 2018 // SPS Consultant Plus.

[10] Moscow City Court Ruling No. 4g/8-7507 of 24 June 2019; Moscow City Court Appellate Ruling, case No. 33-881 of 28 January 2019 // SPS Consultant Plus.

[11] Third General Court of Cassation Ruling No. 88-19109/2020 of 9 December 2020 // SPS Consultant Plus.

[12] First General Court of Cassation Ruling No. 88-8658/2023 of 29 March 2023 // SPS Consultant Plus.

Since Russian Federation laws and other regulations do not define how much text or other material from a copyright work amounts to plagiarism, reproduction or citation, the involvement of a forensic expert may be required to analyze the use of a protected intellectual asset. In identifying matching or reworded text, the expert will confirm or dismiss part of claims or, more exactly, provide additional information on the work in question required for decision-making; describe the intellectual asset, identified information and manipulations with the asset, devices and media but will not qualify them. These facts and information will be evaluated by court with reference to the expert's opinion. The judge will qualify the defendant's actions in light of available evidence and conclude whether there was a violation.

Apart from plagiarism and borrowed/reworded text, experts are asked to identify "original text editing, whether the borrowed text (fragments thereof) is original/non-original or commonly used" [Galiashina E.I., 2006: 178].

Phonoscopic forensic examinations concern works subject to related rights such as performances and sound recordings. (It should be noted that while disputed sound recordings may be associated with the same pieces of music performed by the same artists, they can represent works covered by specific legal protection if the recordings were made, in particular, at different times or by different producers, or if one audio recording is a duplicate (copy) or derivative (cover version) of the other.

A phonoscopic examination requires technical expertise to identify any signs of arrangement, distortion, noise or modulation since alterations to the recorded sound can affect even the properties of digital files. The expert can perform an instrumental analysis in order to not only identify metadata associated with the recording and its parts, but also to compare the spectral features of specific sound fragments, identify alterations to the signal, phase spectrum of signal harmonics, background and noise induction, as well as phase differences, discontinuities or jumps.

Digital technologies can apparently help with the said tasks to some extent. N.S. Polevoy advocated the use of mathematical/cybernetic methods in forensic science and legal procedures in his book "Forensic Cybernetics" back in 1982 [Polevoy N.S., 1982]. The issues of using mathematical methods/models and computer technologies for forensic examinations were also raised by other Soviet and Russian researchers, in particular, T.V. Averianova [Averianova T.V., 2009]; R.S. Belkin [Belkin R.S., 1987]; N.V. Vitruk [Polevoy N.S., Vitruk N.V. et al.,

1977]; N.A. Zamaraeva [Zamaraeva N.A., 2001]; D.I. Nemchin [Nemchin D.I., 2002]; E.V. Piskunova [Piskunova E.V., 2016]; T.V. Tolstukhina [Tolstukhina T.V., 1997]; [Tolstukhina T.V., 1998]; [Tolstukhina T.V., 1999], etc.

Forensic examinations are normally time-consuming (authorship examination in case No. A63-22578/2017 took more than one month[13]), only to protract the trial. In addition, the parties, doubtful of the expert's competence, may argue that conclusions are wrong and that the forensic examination procedure was grossly violated[14] and ask the court to resume or commission another examination (Article 87 of the Civil Procedural Code and Article 87 of APC), thus protracting the trial even further. Since digital technologies can store and rapidly process considerable amounts of information, the question is whether a technology (for instance, AI) can replace a human expert.

Harnessing technologies for forensic work will undoubtedly bring some benefits such as faster proceedings and avoidance of subjective bias since no technology will favor a party on the basis of personal, subjective factors.

According to E.V. Piskunova, mathematical methods will not only save time and improve the performance of forensic examinations but also make them objectifiable and even preserve the works to be studied. Mathematical research methods are now used in a majority of forensic examinations [Piskunova E.V., 2016: 34].

But will the technology always take precedence over man, and can it completely replace human expertise?

Digital services that can identify information contained in different devices and media and perform comparative analysis are already available and used, in particular, in forensic examinations to discover IP violations. *Transcribe*, for example, allows to identify a musical fragment in a recording, produce a transcript and also graphically represent sound intensity and other parameters[15] while *Shazam* helps identify musical

[13] Stavropol Regional Arbitration Court Ruling of 14 September 2018, case No. A63-22578/2017. Available at: URL: https://ras.arbitr.ru/ (accessed: 16.07.2024)

[14] Court for IP Rights Ruling, case No. A40-196910/2021 of 29 December 2022. Available at: URL: https://ras.arbitr.ru/ (accessed: 16.07.2024)

[15] Transcribe App and Online Editor. Available at: URL: https://transcribe.com/ (accessed: 16.07.2024)

pieces, audiovisual works etc. by a recorded fragment and retrieve information on metadata. The application makes a digital footprint of a musical piece which is then compared with music in databases. The output includes information on the piece such as its title, performing artist's name, lyrics etc.[16] *Acoust ID* will also identify music by an audio footprint helping to find the associated information (title, performer etc.) in databases using metadata.[17] Applications such as *Echoprint*, *Sound Hound* etc. also serve to create digital footprints and identify audio file contents.

Antiplagiat, Rukontekst and other systems are used by universities to identify borrowings in thesis and dissertation studies. Antiplagiat will identify whether the so-called target text (word string) matches the texts and other materials in the connected units (databases) to calculate the percentage of original text, citations, self-citations and matches. The output will contain references to sources of matches, citations and self-citations including matching fragments in the identified sources. Each university, publisher or another organization interested in text publication has its own criteria of originality and text matching tolerances.

Digital services can be apparently adapted as a digital tool for forensic study to expedite opinion drafting.

Meanwhile, the currently available analytical systems have certain defects since matches are identified both within paragraphs and other parts of the text while what is counted as matches (paragraphs, sentences and word combinations) may be widely scattered and logically disconnected. Thus, Antiplagiat has certain inaccuracies, such as marking the text as a match rather than citation despite a reference to the source, and showing sources of matches irrelevant to the subject of study and not containing the target text. Some of the system's defects are discussed in more detail in Sergo's article "Antiplagiat and other ways to undermine the quality of research texts" [Sergo A.G., 2023: 40–45].

Further, the outcomes generated by both musical and literary services depend on the contents of connected databases used to check whether the data they contain are reliable. While an expert also relies on available data, he will need considerably more time to find and request information required for control than a web service would. However, if informa-

[16] Shazam. Available at: URL: https://www.shazam.com/ru-ru (accessed: 16.07.2024)

[17] Acoust ID. Available at: URL: https://acoustid.biz (accessed: 16.07.2024)

tion is not adequate or sufficient, the expert can keep searching while a digital service will confine itself to available resources.

In a comparative study, both the expert and the digital service will identify text fragment matches which may indicate that the authors (of the target text and similar text that the service refers to) has borrowed or used the same sources both copyright-protected or not (such as regulations, court rulings, information materials referred to in Article 1259 of the Civil Code) that do not require the copyright holder's consent. Matches can include, in particular, set phrases such as those used in copyright law that can be both found in regulations and doctrinally developed: violation of exclusive right, bypassing digital rights management, entity for collective rights management etc. As someone possessing special knowledge in the given field, the expert will normally know set phrases while digital services are yet to be refined in this regard.

The methodological guidelines for Antiplagiat provide for a possibility of such matches — for example, papers on jurisprudence can have fragments of court rulings, regulations, references to historical sources or archived documents [Belenkaya O.S., Strelkova I.B., Filippova O.A. et al., 2021: 13].

As follows from the methodological guidelines mentioned, Antiplagiat-checked texts will require a review: the system only serves as an aid to identify large unauthorized borrowings where the sources to be compared with the target text are loaded to the connected module.

In performing a comparative analysis of copyright works to identify available related information, experts will not only note exact matches but also characterize the items in question since courts in specific cases have to establish the protectability of disputed work where authorship or title is a matter of controversy. As observed in the opinion of a commission for examination of artworks in case No. 88-6869/2023, "the plaintiff's pictures... exhibit clear physiognomic, stylistic and proportional features of *Antoshka* and *Domovenok Kuzya* from the eponymous cartoons and the underlying animated (stop-motion) images. The plaintiff's pictures do not exhibit a well-thought composition or clearly constructed and original coloristic manner...".[18]

Depending on the assignment, experts can examine not only disputed artworks but also the author's whole creative output to identify

[18] Second General Court of Cassation Ruling of 27 April 2023, case No. 88-6869/2023 // SPS Consultant Plus.

speech patterns and style. In performing an authorship examination in case No. 2-24/2021 to recognize authorship and co-authorship of research papers, the expert observed a characteristic "diversity of introductory modal constructions, expressive syntax patterns in the form of author monologue segmented as questions and answers, parceled complex sentence patterns, active use of conjunctive constructions involving *that*, and other speech patterns not found in the disputed articles".[19]

Thus, forensic examination of copyright works is essentially exploratory rather than technical as noted by specialists including T.F. Moiseeva who pointed out that "it is research that makes forensic examination different from other forms of special knowledge" [Moiseeva T.F., 2024: 6]. Meanwhile, forensic examination of copyright works is not just research but creative research since the target works are themselves creations. A similar approach equally applies to works subject to related rights such as performances that are also treated as creations. In respect of these works, digital services can still play only auxiliary roles.

Can artificial intelligence be a better fit for forensic purpose?

This article does not purport to give a definition of artificial intelligence which is defined, in particular, by Federal Law No. FZ-123 "On the Experiment to Establish Special Regulation to Enable the Development and Introduction of AI Technologies in the Federal City of Moscow as a Constituent Territory of Russia, and on Amending Articles 6 and 10 of the Federal Law on Personal Data" of 24 April 2020. As follows from paragraph 2, Article 2 of this Law, a technology in order to be recognized as AI should "mimic human cognitive functions (including self-learning and searching for solution outside a preset algorithm) and handle specific assignments with an outcome at least comparable to that of human agents".[20] Similar definitions could be found in national standards such as GOST R 59277-2020 "Artificial Intelligence System. Classification of AI systems" (para. 3.18).[21] Specialists view artificial

[19] Seventh General Court of Cassation Ruling of 12 May 2022, case No. 88-6581/2022 // SPS Consultant Plus.

[20] Federal Law No. 123-FZ "On the Experiment to Establish Special Regulation to Enable the Development and Introduction of AI Technologies in the Federal City of Moscow as a Constituent Territory of Russia, and on Amending Articles 6 and 10 of the Federal Law on Personal Data" of 24 April 2020 // Collected Laws of Russia, 2020, No. 17. Art. 2701.

[21] National Standard of the Russian Federation GOST R 59277-2020 "Artificial Intelligence System. Classification of AI systems". Available at: URL: https://docs.cntd.ru/document/1200177292?ysclid=m1ujrmwo2e845963311 (accessed: 16.07.2024)

intelligence as a heuristic setup rather than data processing algorithm since heuristics is closer to human behavior by virtue of decision-making based on specific instructions, search rules and arguments [Piskunova E.V., 2016: 67].

Moreover, it is worth noting that AI, unlike many digital services today, does not boil down to a software connected to a database. According to researchers, "machine learning was actually inspired by neurobiological exploration of how information is processed by human brain". However, despite the advances in science including neurophysiology, technologies are yet unable to imitate human cognitive functions, including because it is not fully clear how information is transmitted and processed by human nervous system, something that affects behavior and decision-making and would allow to create technologies with similar capabilities. Researchers still do not know "how the brain encodes cognitive information and how the next AI generation could use it" [Medvedev Yu., 2020]. Meanwhile, other researchers have a different, albeit arguable, view that "advanced ML (Machine Learning) methods are no longer focused on biological models" [Anokhin K.V., Novoselov K.S., Smirnov S.K. et al., 2022: 98, 102].

The current AI technologies can be characterized as "weak" artificial intelligence perfect for searching and comparing information from an enormous body of data. Such technology is essentially an improved high-performance software. For AI to "learn" and later "self-learn" to perform forensic examination, the process has to be algorithmized but this is hampered by a lack of clear criteria in the Russian law, including the (terms) of protectability of copyright works.

The Civil Code of Russian Federation defines the "author" as "an individual whose work has resulted in a creation or other intellectual output" (Articles 1228 and 1257). As follows from Article 1257 and 1259 of the Civil Code, a creation shall be deemed protectable if embodied in an objective form. Such approach supported by specialists [Pavlova E.A., 2023:289] is also reflected in the Supreme Court of the Russian Federation explanations contained in paragraph 80 of Supreme Court Plenum Resolution No. 10 "On Applying the Civil Code of Russia, Part Four" of 23 April 2019.[22] This paragraph implicitly provides that novelty, uniqueness and/or originality can all be the qualifying cri-

[22] Supreme Court Plenum Resolution No. 10 "On Applying the Civil Code of Russia, Part Four" of 23 April 2019. Available at: URL: https://www.vsrf.ru/documents/own/27773/ (accessed: 30.06.2024)

teria of creative work. In particular, E.P. Gavrilov [Gavrilov E.P., 2020: 303–306] believed singularity, originality and uniqueness to be characteristic of creative work. He argued that while novelty was characteristic of works subject to patent law, those subject to copyright were characterized by originality. Meanwhile, according to A.P. Sergeev, novelty and originality are interchangeable [Sergeev A.P., 2001: 111]. However, as also follows from paragraph 80 of the Resolution, a failure to meet the above criteria (novelty, uniqueness and originality) does not imply that the author's work is not creative. Yet the Civil Code does not provide a definition of "creative work".

Thus, there are no clear criteria established by law for the expert to conclude that a product is the outcome of creative work. He can describe a work's characteristics as a proof of the author's creative efforts for the court to conclude whether someone's intellectual property is protectable, borrowed or used. In examining an artwork (floral design used as a print on various goods) and goods themselves, an expert has observed that the plaintiff's creative input was manifested "in the selection of floral items to create a design; in the development of a unique composition viewable from different angles and changeable depending on the viewer's perspective; in the development of individual principles to produce stylized floral designs as well as methods of artistic presentation (using stains, contours and colors to suggest a form)...".[23]

The notions of "creation" and "creative work" could be viewed as abstractions that present one of the most significant challenges for replacing human experts with technologies such as AI. A lack of clear criteria to define "creation" is a challenge for fully digital forensic examination as the accuracy of results produced by technology will increase with more clear-cut parameters to be checked and accounted for. The more abstract the criteria, the higher the likelihood of deviation, with more examples to be processed to identify common characteristics.

The question of qualifying criteria was raised back in the Soviet time including by V.Ya. Ionas [Ionas V.Ya., 1963]; V.I. Serebrovsky [Serebrovsky V.I., 1956]; B.S. Antimonov and E.A. Fleishits [Antimonov B.S., Fleishits E.A., 1957], who believed originality and novelty to be the criteria or, more precisely, features of creative work. Moreover, according to V.I. Serebrovsky, novelty "can be expressed in a new content, new form, or new idea, new scientific concept" [Serebrovsky V.I.,

[23] Second General Court of Cassation Ruling of 18 June 2020 // SPS Consultant Plus.

1956: 35]. B.S. Antimonov, E.A. Fleishis argued that novelty could find its expression in the work's underlying idea and imagery [Antimonov B.S., Fleishits E.A., 1957: 85, 120]. V.Ya. Ionas believed that novelty could be reflected in different features shared by all works of art such as objective form of the work's existence, language, imagery, ideas and emotional content, and in artistic form and storyline as additional features proper of literature and arts [Ionas V.Ya., 1963: 68]. While these researchers identified what is likely to prove the author's creative work, these qualifying features are not binding either for the Soviet or under the Russian law. These characteristics could only be taken into account by experts in providing an opinion on protectability and use of protected intellectual assets.

One must admit that technologies are able to identify similarities in the storyline or imagery. The works narrating a story (such as fiction, drama, audiovisuals) share a certain intrinsic structure, specific patterns including arranging and developing a plot as a certain sequence of events, and presence of some elements that make up a story. The number of possible storylines is believed to be limited. Where Georges Polti has identified 36 storylines common in 19th century[24] and Jorge Luis Borges just 4,[25] researchers now count over 1,000 ones. Undoubtedly, while numbers can differ depending on the preset criteria, one must agree that there are limits to storylines, especially for works of art, something that makes it possible to systematize and classify them.

Researchers believe today's neural networks to be able to collect a large number of facts and establish certain patterns. Moreover, AI can draw logical conclusions [Anokhin K.V., Novoselov K.S., Smirnov S.K.et al., 2022: 99]. The currently used AI technologies based on prompts — text queries describing the task for neural network — can generate the results relating to literature and arts. In learning from works that exist in an objective form, the technology will "memorize" schemas, samples, patterns of the studied works, with higher statistics of repetitions making the "idea" of these elements more "definite". In other words, the analysis and descriptions of works can be regarded as an opposite action to processing of prompts and generating a prompt-based outcome. Thus,

[24] Polti G. Les 36 situations dramatiques. Paris, 1895. Available at: https://www.gutenberg.org/cache/epub/72036/pg72036-images.html (accessed: 16.07.2024)

[25] Borges J.L. Los cuatro ciclos. Available at: https://www.babelmatrix.org/works/es/Borges%2C_Jorge_Luis-1899/Los_cuatro_ciclos (accessed: 16.07.2024)

the representation of characteristics of different works can be handled by technologies. A similar approach could apply to characters that can be copyright-protected in Russia (paragraph 7, Article 1259 of the Civil Code). Creating digital tools to identify similarities between storylines and characters would help experts identify derivative works, borrowings and remakes.

E.V. Piskunova in her article "Computer technologies and forensic work", gives a number of examples of harnessing computer technologies to examine the works of art. In particular, she refers to the Polish writer Stanislaw Lem's idea of decomposing the works of an author in a multidimensional coordinate system for spatial representation of critical features such as style, storyline, composition, structure, language etc. This will make a graphical cluster characterizing the author's work where imitations will be outliers. This idea was implemented to some extent by Swedish researchers through analysis of each author's language who concluded that individual features of each writer would help with identifying authorship. In addition, E.V. Piskunova refers to a mathematical method based on identifying critical "features of the artist's personal style" implemented by researchers at the Cornwall University to identify whether artworks were authentic. In converting these features into numbers and formulas, they divided the work in question into calculable fragments to be compared with those of the original artist [Piskunova E.V., 2016: 107, 108].

Meanwhile, works subject to copyright and related rights are diverse, with each intellectual output being specific in terms of its structure, expressive means and other creative features. Thus, a storyline is not so critical for composite works, computer software and databases as it is for literary works; they are peculiar in the structural arrangement of textual or other materials while computer applications differ in their functions, and databases might not only have a specific structure but will differ in the way they process and systematize data including search engines etc. An analysis of current legal precedents in Russia with regard to copyright protection of photographs reveals a general trend where the author's creative input plays only a minor role for copyright protection of photographs. According to Russian courts, creative work may manifest itself in specific light settings, choice of exposure, spatial arrangement of objects, etc.[26]

[26] Court for IP Rights Ruling of 3 February 2022, case No. A57-213/2021. Available at: URL: https://ras.arbitr.ru/ (accessed: 30.06.2024)

Moreover, works subject to related rights are not so homogeneous as the original creations. Whereas performances also share certain creative features such as artistic form inherent in artworks (it is not by accident that a proposal to qualify performance as derivative work was discussed in amending the Bern Convention for the Protection of Literary and Artistic Works), recordings and broadcasts lack the features proper of copyright works as they present other parameters of technical nature. For databases protected by related rights, critically important parameters will be both quantitative (such as the content in excess of 10,000 independent data units) and qualitative, in particular, financial costs to collect and maintain the information that makes up the database.

It should be also borne in mind that while digital technologies could process the items represented in digital form, intellectual outcomes may take a variety of forms. That is, technologies can apply to digital objects or objects converted to digital form beforehand. However, one should remember that conversion of certain works into digital form may result in a loss or distortion of specific parameters (nuances of color, light, sound) of paramount importance in certain cases. Thus, a change of material for a copyright work such as sculpture can affect the overall impression and perception by not only users but also specialists, only to undermine the final conclusion with regard to unauthorized use such as reproduction as well as reworking considered by Article 1270 of the Civil Code as independent use.

Using and borrowing copyright works to make other creations can be normally proved by matches identifiable by comparative analysis. Meanwhile, in order to use digital technologies for this purpose, all features common to the respective types of intellectual outputs should be taken into account. Thus, the diversity of items subject to copyright and related rights will require to develop either different tools for each intellectual outcome or (which appears more efficient) shared technology that would allow to account for the diversity of intellectual properties, their creative features and forms of expression.

With advances in AI technologies, the identification of works generated by AI becomes an increasingly challenging task. The expert can check the information that comes with the generated outcome (heading, description, comments and hashtags) for reference to AI, perform reverse image search, look for distortions. Analysis of text outcomes will focus on the absence of grammatical errors and certain discontinuity of individual fragments, lack of emotional coloring, professional jargon and non-typical abbreviations.

AI-generated items will sometimes have watermarks: for example, Open AI Dall-E 2 images will have five multicolor squares in the bottom right corner while Dall-E3 images — visible CR symbols in the upper left corner. Moreover, watermarks will be sometimes added to metadata.

However, it may well be that the said process will fail to achieve the objective of clearly identifying AI-generated outcomes. Even the increasingly used watermarks do not provide absolute protection and, since they could be deleted, may be of no help.

In this regard, harnessing digital technologies including AI to identify texts and other AI-generated outcomes holds a promise. It is worth noting the already available services able to identify works generated or edited by AI. For texts, these include *AI Detector* by text.ru, *Ai Busted*, *AI Content Detector*, *AI Text Classifier*, *Crossplag*, *GPT Zero*, *Contentat Scale*, *Copyleaks*, *Corrector*, *Sapling*, *Writer AI Content Detector*, *Writer*, *Zero GPT,* etc.; for images, *Hive Moderation*, *Optic AI or Not*, *AIArt Detector* etc. However, these services have limitations and are prone to error, with AI-generated outcomes sometimes attributed to man while those of human intellect attributed to AI.

Conclusion

Thus, digital technologies can be harnessed to perform forensic examination in disputes on violation of copyright and related rights. However, a number of steps will need to be taken before these technologies are fit for the purpose.

AI learns on a large number of valid examples. Where they are unavailable or deficient, the results may have defects while the technology will need to be validated in respect of those works that have a stock of expert opinions.

Overall, the development of shared approaches through standardization could be beneficial for forensic examination in the area of copyright and related rights as was repeatedly stressed by specialists, in particular, E.I. Galiashina [Galiashina E.I., 2020: 144–148]; [Galiashina E.I., Privodnova E.V., 2006: 761]; N.P. Maylis, T.F. Moiseeva [Maylis N.P., Moiseeva T.F., 2018: 219–224]. Before technologies could be used, it is needed to develop the relevant methodologies applicable to all copyright works to be accounted for in the examination algorithm (while such methodologies are available for examination of recordings and computer software [Galiashina E.I., 2006: 177], they are still emerging

in respect of other copyright works). Unless there is a tried-and-tested methodology, using a digital technology including AI to perform forensic examination and make an opinion appears premature. The methodologies underlying the AI-enabled examination algorithms should be open and available to judges. But even with the shared methodologies, algorithms and machine learning templates for AI to make draft opinions, the technology would only provide a tool to expedite the examination and legal proceedings as a whole. It is the expert who will have the final word and confirm the (generated) draft opinion.

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