Emerging Ethical and Legal Issues Related to the Use of Artificial Intelligence (AI), Automatic Speech Recognition (ASR), Voice Cloning, and Digital Audio Recording of Legal Proceedings

National Court Reporters Association (NCRA)

November 2023

STRONG Committee, 2020-2023

TABLE OF CONTENTS

Background: A Brief Overview of Court Reporting

The National Court Reporters Association (NCRA) is recognized worldwide as the leading authority on capturing and transcribing the spoken word into writing. The organization's mission is to apply the knowledge and experience of verbatim stenographic reporters working in cooperation with the courts and bar toward improving the criminal and civil justice system to best serve the public good.

Court reporters are highly trained professionals who share a unique ability to convert the spoken word into information that can be read, searched, and archived. These experts also are known as "guardians of the record" because of their impartiality and role within the judicial process primarily capturing the words spoken by everyone during a court or deposition proceeding. Court reporters then prepare verbatim transcripts of proceedings.

Stenographic court reporters are impartial officers of the court who must comply with state laws and federal and state court rules regulating their practice.

The official record or transcript they generate helps safeguard the legal process. By combining their skills with the latest technology, some court reporters provide realtime access to what is said during a trial or deposition for the benefit of all involved parties. A court reporter providing realtime — the only proven method for immediate voice-to-text translation — allows attorneys and judges to immediately access a transcript while also providing a way for people who are deaf or partially deaf to participate in the judicial process.

Artificial Intelligence (AI) and its subsets, such as machine learning, are only among the latest in more than a century of technological advances that have disrupted and ultimately advanced the professions of court reporting and captioning. AI is defined as "a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments," according to the National Artificial Intelligence Act of 2020.

As highly trained, tech-savvy professionals, America's court reporters and captioners have long mastered cutting-edge innovations to bring the spoken word to text accurately in real time. Indeed, today's court reporters can accurately capture in writing 225 or more spoken words per minute in real time.

To ensure the highest professional skills possible, including mastery of relevant technologies, NCRA is the primary leader in setting national certification standards and assisting states with their own certification or licensing requirements. To that end, the Association has administered a nationally recognized certification program for court reporters since 1937. In addition, many states currently accept or use the NCRA's Registered Professional Reporter (RPR) certification in place of state certification or a licensing exam.

Clearly, court reporters do not fear or avoid technology innovations when they know that such changes are reliable, trustworthy, and strengthen transcript protection, accuracy, access, and speed. However, AI has flaws and is developing so rapidly that even the world's leading AI developers and users are urging caution and greater control by governments. Indeed, more than 1,000 CEOs and AI leaders sent a joint letter in early 2023 to policymakers urging federal and state governments to establish guardrails and standards for the application and creation of AI systems.

These leaders emphasized that AI and the use of machine learning or AI technologies to process human speech into text (known as Automatic Speech Recognition or ASR) are not unimpeachable in their work and outcomes.

From the perspective of NCRA, such technologies have already proven to be untrustworthy and risky for the court reporting profession, especially when compared to the tremendous human expertise, integrity, and experience of court reporters.

Other leaders and practitioners in the judicial system also have expressed concern and warnings about the growing use, ethics, and influence of AI and ASR in the nation's legal system. In August 2019, for instance, the American Bar Association (ABA) House of Delegates adopted Resolution 112 urging courts and lawyers to address the emerging ethical and legal issues related to the usage of AI in the practice of law.

NCRA adopted a resolution urging stenographic court reporters, stenographic captioners, affiliate associations, lawyers, bar associations, courts, and federal communication regulatory agencies to address the emerging ethical and legal issues related to the use of AI, ASR, voice cloning, and digital audio recording of legal proceedings without a stenographic court reporter present to verify the chain of custody of the official record.

With both resolutions in mind, NCRA launched a three-year study exploring how these emerging technologies could impact the capture of speech-to-text modalities within the legal justice system when creating the record for courts and other testimonial proceedings. NCRA has developed long-standing principles, opinions, and guidelines that are essential to the justice system.

Ensuring AI is developed and used in accordance with established standards and guidelines as well as in conjunction with state and federal rules and laws is critical when the use of such technology could erode the public's confidence, trust, and faith in the fairness and legitimacy of the judicial system.

I. Introduction to the Risks and Harms of Artificial Intelligence (AI) and Automatic Speech Recognition (ASR) in the Court Reporting Process

The federal justice system and the justice systems of every state rely on the integrity and accuracy of the trial court record for appeals. Without a proper record of what occurred in the trial court, an appellate court may be left to decide matters of law based on the best available means, including the appellant's recollection.[1]

Courts unable to attract and retain stenographic court reporters, coupled with always-evolving technology, may push decision-makers and the public to ask why court proceedings are not digitally recorded and automatically transcribed by computers or manually transcribed by humans later.

In this white paper, NCRA examines the possible risks and harm to a legal record when introducing the use of AI and digital audio recording of legal proceedings without a stenographic reporter present to verify the chain of custody of the official record. This paper also explains how the use of such technologies may be inimical to the public's faith in the fairness of the judicial system.

Most people agree that digital technology has brought important benefits to society. However, the authentication of digital multimedia is an emerging challenge since it has become increasingly easy to manipulate recorded audio contents using a growing number of free and generally accessible software tools.

Today, when authenticity examinations are conducted on digital audio and video files, the purpose of these complex analyses is fourfold to determine if a file

(1) is an original or clone (i.e., a bit-for-bit copy) or a re-encoded or transcoded copy,

(2) contains any alterations,

(3) has any discontinuities due to stop or start events, and

(4) matches the characteristics of a specified recording system, if known.

These authenticity examinations, probably more than any other forensic laboratory analysis, require a more conceptual rather than purely "cookbook" protocol since every case differs from prior ones. This variance is due to dissimilarities in the audio or video material, metadata, compression effects, and diverse forms of possible duplication and alteration. For example, the "loudness of the sound environment will produce prominent peaks, which may be too loud for the mix. However, [courts] can lose the quieter moments when turning the overall gain down. In this case, the solo speaker may get lost."[2]

"The role of an audio recording is very important for criminal investigation agencies and for a court of law [since] it is admissible evidence," according to authors D. P. Gangwar and Anju

Pathania in their July 2020 article “Authentication of Digital Audio Recording Using File’s Signature and Metadata Properties” in the *International Journal of Engineering Applied Sciences and Technology.*[3]

Unauthentic and forged multimedia can influence the decisions of courts. It also is fact that audio recording evidence remains as useless evidence until it is proven that a recording is authentic or free from any kind of tampering or editing. The detection of editing in an audio recording is a challenging task to forensic scientists, one that requires greater attention in this field.[4]

The ease of altering digitally recorded audio files poses a major problem for the legal justice system. A person with no training and minimal experience can manipulate the audio recording in an effort to change testimony nearly seamlessly. Given the availability of free audio editors and universally accessible tutorials on how to alter audio, the public, courts, lawyers, litigants, and justice protection organizations must examine the trustworthiness of an audio- or video-only record more thoroughly than ever.

A digital recording is the result of laying down a track of numbers, zeros and ones, in various sequences into an audio file. Analyzing whether a digital recording has been altered and whether the ones and zeroes follow each other in a seamless stream that shows no interruption where an edit has occurred is difficult without highly trained forensic experts.

As Section 7.1.1 of the Scientific Working Group on Digital Evidence’s (SWGDE) Best Practices for Forensic Audio advised in 2022, “Transcoding could affect the audio content (aliasing, compression).”[5]

For the same reason, a digital stream, once placed into a computer, can be extracted in any sequence required by the operator. This ease of manipulation, coupled with the difficulty of detecting such manipulation, creates an opportunity to tamper with important audio evidence.

In stark contrast to traditional alteration is the possibility that audio may be completely fabricated. With the emergence of voice cloning, also known as deepfakes, participants in court proceedings, including depositions, may be targeted for impersonation. Using tools available to anyone online, a person’s voice or image may be manipulated into a deepfake.

The first publicized instance of how effective deepfakes can fool even the most educated people was a 2019 case in which the CEO of an energy firm transferred hundreds of thousands of dollars to a scammer after the leader thought he was speaking to his boss based on the caller’s “melody” and slight accent, according to *Forbes*.[6] The technology for voice cloning has certainly advanced since 2019, increasing concerns of more sophisticated malfeasance including acts that could harm court proceedings and decision-making.

II. Consequences of Choosing Digital-Only Methods

Close inspection of the transcription protocols for courts also is required to maintain the American public’s trust in their judicial system. Stenographic court reporters provide an

unbiased certification to their firsthand knowledge as witnesses to the proceedings for which they are charged with making an accurate record, guarantee a chain of custody of that record, and are backed by regulatory and licensing oversight. Court reporters ensure an unbiased certification that is easily verifiable through the embedded stenographic watermark within personal shorthand notes contained with their file.

In addition, human transcribers living in the United States are subject to subpoena, if required. Outside of its jurisdiction, a subpoena may become no more than a "clumsily worded wish list," as Aaron Lukken explains in a 2016 post on the Hague Law Blog.[7] Additionally, any errors in transcription, particularly with offshore transcription, can have serious consequences.

Quality Control

The quality of an audio recording can lead to serious gaps in testimony. Transcripts have been made from audio recordings with portions missing because testimony was inaudible or garbled, according to Joseph Darius Jaafari and Nicole Lewis in their 2019 article "In Court, Where Are Siri and Alexa?" for The Marshall Project.[8] Any single case has great value for the parties involved.

The risk of a transcript being incomplete, inaccurate, or misleading cannot be overstated. In the context of AI, individual and enterprise accountability and human authority, oversight, and control are required, and it is not appropriate to shift legal responsibility to a computer or an algorithm rather than to responsible people and other legal entities, as stated the American Bar Association Cybersecurity Legal Task Force Antitrust Law Section in 2023.[9]

One startling example of the shortcomings of relying on digital recording methods to capture an accurate and official record appears in a 2022 article, "Make Sure Your Court Reporter Is Really a Court Reporter," in the *Los Angeles and San Francisco Daily Journal.* Family law attorney Melissa Buchman and coauthor Mary Pierce recount how Buchman lost a domestic violence case because 55 pages of testimony were missing — all uncaptured by the digital recording method used during a remote deposition.[10] She is not alone in her experience.

Additionally, transcripts prepared by anyone other than the person who digitally recorded the proceedings make chain of custody difficult to track and do not comply with Federal Rules of Civil Procedure (FRCP) 80. FRCP 80 declares, "If stenographically reported testimony at a hearing or trial is admissible in evidence at a later trial, the testimony may be proved by a transcript certified by the person who reported it." Stenographic court reporters can provide that certified proof while AI or digital recordings alone cannot.

How does human error in transcription factor into this equation? One might assume that the answer to this question is to automate the process. Automatic speech recognition is often touted as an incredible tool available for use by the bench, bar, and other court users and participants.

Unfortunately, when ASR or AI misunderstands a word, there is a good chance it will be omitted or substituted with something that is completely irrelevant. Omissions can drastically change the meaning of what has actually been stated, resulting in inaccurate transcripts. As research has shown, the accuracy ratings of ASR leave much to be desired and also demonstrate the high risk of bias.

For example, an objective review of ASR by Stanford University researchers studying a potential "Race Gap in Speech Recognition Technology" showed an error rate of about 20 percent for white male speakers, 40 percent for Black male speakers, and 35 percent and 19 percent for white female and Black female speaker respectively, and an even higher error rate when speakers spoke in the African American English dialect (AAE).[11]

Of particular concern is the study's conclusion that all of the most common speech recognition systems performed "particularly poorly for Black men, with more than 40 errors for every 100 words."[12] This is especially concerning since disproportionately large numbers of Black males are engaged in the legal system in positions ranging from judges to the accused and thus are regularly recorded in court.

"The leading speech recognition tools misunderstand Black speakers twice as often as white speakers," wrote the research team. "To close the gap, we must create more linguistically diverse and inclusive datasets." That takes time and investment, and in the meantime, ASR and AI continue to be applied widely throughout nearly all aspects of society.

Concerns also have been raised regarding the use of AI translation in immigration cases. "Machine translations of Pashto and Dari, in particular, are riddled with errors that have introduced confusion into already complex immigration processes, and led to the rejected asylum claim of at least one Afghan refugee," stated an April 19, 2023, article, "AI Translation Is Jeopardizing Afghan Asylum Claims," in *Rest of World*.[13]

In a justice system dedicated to equality, automated transcription has no place because it continues to yield transcripts that contain many "inaudible" parentheticals as well as higher error rates than trained human court reporters.

Costs

The cost of digital recording also can soar above a stenographic record.[14] Depending on the accounting methods, personnel, and court setup, comprehensive pricing can vary wildly.

In late 2018 the Pierce County Superior Court, state of Washington, was asked if cost savings could be achieved by use of electronic recording and creating a small pool of court reporters for specific trials. This question triggered a statewide staffing study by the court administrator to determine the staffing and cost breakdown for other courts in Washington.

Based on the research, the study showed "actual cost savings would be minimal at best, with the court performance suffering greatly from the lack of realtime reporting. There is no court recording equipment which has the performance level of a court reporter."[15]

Without training and staff dedicated to the supervision of audio systems, these systems cannot be expected to perform well.[16] To make an audio- or video-only record, a court must — at a minimum — have signage that notifies participants when proceedings are being recorded, have judges remind participants to speak slowly and clearly for each case, position microphones and/or cameras to fully capture the audio, and have a dedicated courtroom audio monitor to assist the judge in conducting court proceedings.[17]

Transcript Turnaround Times

It is clear stenography remains the most reliable and cost-effective method of capturing the legal record, not only due to stenographers' crucial roles as impartial observers and verbatim notetakers, but also because transcription from an audio source is far less efficient, resulting in delayed transcript turnaround times.

The average person can transcribe an hour of audio in four hours.[18] Seven hours of audio could take more than 28 hours to transcribe.

By comparison, stenographic court reporters are relied on to produce "daily" transcripts,[19] meaning the full day of testimony would be delivered to end users shortly after conclusion of the proceedings. High-quality rough drafts and realtime services are available for immediate review of testimony during the pendency of the proceedings.

With stenographic reporters' superior efficiency, reliability, expertise, similar cost, and built-in protection against emerging deepfake and voice cloning technologies, courts and the general public would be wise to continue to entrust stenographic court reporters with guarding the legal record.

Archiving Requirements

Another concern raised about AI and ASR relates to the safety of digitally stored media. Storage of digital media on traditional hard drives leaves much to be desired. Analysis of hard drive lifespans concludes that only 80 percent of hard drives will reach their fourth anniversary without malfunctioning.[20] A minimum of three backups, including one offsite, is recommended for traditional digital data storage.

Courts and attorneys that seek to keep their own personal storage libraries but do not invest in personnel to organize, supervise, and maintain the equipment face a serious chance that data will be lost.

In addition, storing data through cloud computing solutions remains an optional practice rife with cybersecurity threats, including cryptojacking, hijacking of accounts, data breaches, and denial-of-service attacks. Cloud computing is considered a responsibility shared by the customer and the service provider.[21]

The hijacking of accounts is among the greatest risks for administrators of high-volume courts. More cases mean more personnel require access to the cloud accounts. More personnel with access means more potential openings for successful phishing scams.

III. Readiness of the Legal Justice System for Automatic Speech Recognition (ASR), Artificial Voice Recognition (AVR), and Voice Cloning Technology

The global speech and voice recognition industries are worth tens of billions of dollars built on the collection of users' biometrics without meaningful protections for the public in terms of data storage, retention, security, and privacy concerns.[22] Biometrics are defined by Merriam-Webster as "the measurement and analysis of unique physical or behavioral characteristics, especially as a means of verifying personal identity." Common examples of biometric data are fingerprints, voiceprints, faceprints, and iris scans.

Video and audio cloning have benevolent uses in film, audiobooks, podcasts, and even medical settings where throat cancer or laryngectomy patients can clone their own voice to be used later through an implanted box, allowing them to regain the ability to speak in their own voice.[23]

However, with the advent of the ethical and beneficial uses of these technologies comes the higher likelihood of nefarious and unethical uses that could occur using the same voice cloning concepts. AI and biometrics are certainly welcome advancements in the ethical uses of voice cloning, but there is growing concern for courts and litigators who now must further protect the safety, reliability, and security of court records.

Gone is the time when a transcript or evidence derived from an audiotape or videotape introduced at trial was assumed to be authentic with few questions raised. Courts must now be forward-thinking and extremely cautious in identifying such authenticity and ensuring a strict, documented chain of custody in all audio and video files presented.

Courts also must maintain the same level of security with their own audio and video files which they may transfer to transcribers. If a particular audio or video file were in the hands of a transcriber or multiple transcribers, the possibility exists that the file can be altered to change what is actually spoken on the media file with creative editing or voice cloning technology.

Consider this scenario: An audio or video file could be altered, whether purposefully or unwittingly, and then sent to a transcriber. How then would a transcriber be able to certify that what was received and listened to is indeed the authentic recording? The same can be said when the transcriber sends the transcribed file back to the court or other agency. Who verifies that the transcript received matches the audio that was provided to the transcriber?

In the case of the 55 pages of missing testimony cited earlier, it appears there was a lack of comparison with the audio file. The bottom line is that court files have many touchpoints, all with the potential of a breach and all with the potential to influence court and legal outcomes.

Unfortunately, legislation and court rules have lagged behind emerging AI, ASR, and deepfake technology. Few federal and state laws currently exist that address deepfakes. Although AI has existed in some form since the 1950s, the first federal law to address deepfakes was enacted in late 2019.[24] Recently, governmental agencies and other scientific organizations have proposed AI governance best practices and principles, attempting to mitigate or minimize risks associated with the technology. On October 30, 2023, President Joseph R. Biden, Jr. issued the Executive Order on Safe, Secure, and Trustworthy Artificial Intelligence, charging multiple federal agencies with producing guidelines and taking other actions to advance the safe, secure, and trustworthy development and use of Artificial Intelligence.

On January 28, 2020, the Federal Trade Commission held a workshop with world-renowned experts titled, "You Don't Say: An FTC Workshop on Voice Cloning Technologies." The assembled experts and regulators explored the dangers and risks that this technology poses to society. Their takeaway was heightened concern about how easily this technology can be acquired, deployed, and seemingly go undetected without the use of a forensic expert.

On April 26, 2023, Sen. Mark Warner (D-VA), Chair of the Senate Select Committee on Intelligence, sent letters to CEOs of leading AI companies to express concerns about the risks of these technologies.

"'[W]ith the increasing use of AI across large swaths of our economy, and the possibility for large language models to be steadily integrated into a range of existing systems, from healthcare to finance sectors, I see an urgent need to underscore the importance of putting security at the forefront of your work," Sen. Warner wrote. "Beyond industry commitments, however, it is also clear that some level of regulation is necessary in this field."

Sen. Warner highlighted several security risks associated with AI, including data supply chain security and data poisoning attacks. He also voiced apprehension about algorithmic bias, trustworthiness, and potential misuse or malicious use of AI systems."[25]

The introduction of deepfake evidence in the courtroom raises new, profound issues for the administration of justice in both civil and criminal proceedings.[26] The use of AI in America's legal system is certainly a high risk that should be of particular concern and subjected to a higher degree of scrutiny. Security and accuracy of confidential and sensitive information contained in exhibits and transcripts are essential, and transparency in how these records are handled is paramount in maintaining public trust in the nation's justice system. Members of the public should be advised if AI and/or ASR is being used in litigation and should be cautioned regarding those risks.

Courts should expect deepfake audios and videos to begin to find their way into court transcripts and files. Currently, transcripts prepared by digital reporters and/or ASR transcription companies include cleverly worded or misleading "certificate" pages that are designed to give legitimacy to a document that, in essence, has no basis for certification if one person who administered the oath and witnessed the proceedings records the audio file and another person

transcribes the audio file without comparing the resultant transcript. Proper certification and authentication are further complicated if there are multiple undisclosed transcribers involved.

How can courts protect against these dangers?

First, courts can take stock of their own internal security practices. If audio or video is being used to capture the record in courtrooms, it is vital that control measures be implemented that govern who has access to these files and how file access to others outside the organization is granted.

Washington, after a legislative effort, is an excellent example of a state establishing safeguards for its courts. Its new court rule requires chain of custody for audio file in addition to a court requirement to provide authorized transcriptionist standards and oversight.[27]

Another safeguard would be if a court maintains an "approved" transcriber list and prudently takes the additional measure of knowing each person within the transcriber's organization who has access to the files and how they are transferred. Does each transcriber maintain adequate virus protection on their computer, for instance?

While the latter may seem like a mundane question, the public may be surprised at the answers, and the court may want to ensure that safe practices are being followed by its authorized providers. It only takes one data breach for a catastrophic event to occur, so protocols and standards should be developed, defined, and adhered to rigorously.

Another dilemma the courts must wrestle with is evidence introduced by counsel at trial that involves transcripts introduced after having been transcribed from audio or video sources created outside of the court on privately owned audio or video recording devices. Strong safeguards should be put into place regarding the chain of custody of all audio or video media and/or transcripts generated by a method using only audio or video for transcript production.

These pose significant risks of manipulation if strict protocols are not followed — another reason close attention should be given to the "certificate" page of all transcripts. Such scrutiny would determine when one has been recorded and transcribed after the fact, especially when doing so conflicts with any state laws. "Accountability and human authority, oversight, and control are closely interrelated legal concepts."[28]

IV. ASR, AI, and Racial, Gender, and Age Bias

AI lacks the capacity for contextualization that humans possess. It works by combining large data sets with intuitive processing algorithms that can be manipulated by learning behavior patterns within one or more data sets. Most of these sets are created by predominantly white male voices, commonly referred to as "pale male data."

Issues of fairness have arisen because systems do not perform equally well for all subgroups of the population. This is where bias research shows the true risk of harm that can result from the fallibility of AI and ASR.

According to the Stanford University study[29] referenced previously, “Error rates for Black speakers are nearly double those for white speakers. We found that all five ASR systems exhibited substantial racial disparities, with an average word error rate (WER) of 0.35 for Black speakers compared with 0.19 for white speakers.” What is clear across multiple studies is that training data has led machines to learn more about white men’s speech patterns and less about those of women and people of color.

One case in point is that Stanford researchers found that Google’s speech recognition is 13 percent more accurate for men than it is for women. ASR or AI platforms frequently use feminine voices as digital assistants such as Siri, Alexa, and other voice-activated chatbots. However, virtual assistants are more likely to understand male users than female users.

In a different study shared in the article “Bias in Automatic Speech Recognition: The Case of African American Language” in *Applied Linguistics*, “researchers Joshua Martin and Kelly Elizabeth Wright list numerous cases of systemic bias in their evaluation of various speech activation technologies and its often poor interpretation and transcription of speech by African Americans.”[30]

In another example of AI and ASR bias, researcher Lauren Werner concludes in a 2019 article, “Automated Speech Recognition Systems and Older Adults: A Literature Review and Synthesis**,”** that “age-related physical changes may alter speech production and limit the effectiveness of ASR systems for older individuals. Evaluation of several automated speech recognition systems has confirmed previous research that suggested those systems have more difficulty recognizing the speech of older adults.”[31]

Efficient, effective, and equitable solutions will be found when decision-makers include the knowledge and expertise of stenographers in future planning of the best means to capture speech-to-text that depend on humans to hear and conceptualize speech rather than depend on predictive speech models and algorithms.

V. Statutes or Court Rules: Which Supersedes?

While all states have court rules related to the people who may administer oaths and function as a deposition officer, some states have laws that prohibit notaries from providing court reporting services.[32]

Over half the states have statutes regulating all facets of court reporting where legislatures have found it necessary to regulate the practice of court reporting with licensure or certification requirements to protect the public safety and well-being.[33]

However, for many years the litigation arena has seen analog and digital recording equipment in courtroom proceedings. For the same number of years, transcriptions of those recordings have been littered with inaudible and/or unintelligible parentheticals in addition to unidentified speakers.

Despite the problems, many court systems have slowly and tragically adopted a standard of "adequate" rather than "accurate" for these all-important records that must stand the test of reliable review over years or decades.

Although courtroom recording equipment is frequently monitored by court personnel who operate under predetermined court standards, this is certainly not the universal practice. The recordings themselves are known to be largely transcribed by remote employees or contractors or authorized transcriptionists who have no knowledge of the speakers, have no standard guidelines on transcript preparation, and have no requirements in place for security, chain of custody, or preservation of the actual transcription.

The process of digital recording does not transfer well from the courtroom setting to the regular deposition setting in that there is no universal standard or set of requirements related to the equipment used to create an audio recording.

Unfortunately, recording and transcription standards that do exist are widely diverse and largely unregulated. The range of digital audio and video files used by multiple companies is large and ever-changing, as are the practices for distribution and transcription of media. Some digital and video companies are incorporating AI and ASR into transcription of files even though most court rules do not contain specific language allowing either technology.

The first significant challenge of deepfakes is proving that a piece of digital image or audio evidence is genuine.[34] The Federal Rules of Evidence, 901(a), states, "In General. To satisfy the requirement of authenticating or identifying an item of evidence, the proponent must produce evidence sufficient to support a finding that the item is what the proponent claims it is."

K. Chasse, in the article "The Admissibility of Electronic Business Records," suggests that the authentication rule at times appears inadequate because it cannot be established that an electronic record is the same as its first instantiation simply by looking at the record itself.[35] As public knowledge of deepfakes continues to grow and people become increasingly skeptical about the credibility of audiovisual images, jurors will be primed to doubt the authenticity of even real audio and video content.

In *R v Nardi* 2012 BCPC 0318, the court held that in order to support a finding that electronic records are authentic and the "best evidence" of the information proffered, the party seeking to admit the evidence "cannot simply look to the documents themselves." Further, the court said this is especially so when considering information generated from a novel "system."[36]

The court reporting industry is facing an existential challenge in the provision of its vital services. Some video and court reporting companies are encouraging attorneys to stipulate to "digital

court reporters" or "digital video reporters" rather than the skilled and highly trained stenographic reporters on whom they historically rely.

Frequently these companies are encouraging this practice with full knowledge that it does not comply with existing court rules and laws in many jurisdictions. These measures often disregard prior agreement of counsel to use a method other than stenography, which is required in most existing state court rules.

In many instances counsel is not even aware until after the digital reporter or videographer arrives at the deposition, administers the oath, and the deposition is set to begin. When parties believe they are contracting a certified court reporter but instead are ambushed with a non-certified digital reporter or digital videographer, it not only causes strife among litigants, but it also may lead to unwitting violations of laws and court rules. A transcript that is impartially attended and accurately transcribed and certified by the person who witnessed the proceedings imports a verity that is vital to the integrity of legal proceedings.

VI. Conclusion: Protecting Judicial Integrity and Public Faith in America's Legal System: The Necessity of Court Reporters vs. AI and ASR

America's justice system is founded on the premise of providing fair and equal access and equitable treatment to all, and in many circumstances, both in the legal system and without, stenographic court reporters and captioners have always embraced the concept of fair and equitable access.

Stenographic court reporters are committed to the rule of law and their role in it. In its simplest form, the rule of law means that every person in the United States is subject to clearly defined and publicly promulgated, well-accepted legal standards and principles that are equally enforced rather than subjected to the personal whims of powerful corporations, individuals, governments, or other entities.

The concept also embraces two other foundational principles deeply rooted in American jurisprudence: (1) American laws apply equally to all people at all times, and (2) no one is above the law.

However, a September 2022 Gallup survey found that just 47 percent of adult respondents "expressed even some trust in the judicial branch of the federal government, a stunning 20-point drop over the last two years and a 7-point drop from last year."[37]

Reasons vary, but it is safe to say that few within the public understand that transcript integrity and accuracy are foundational to fair, equitable court decision-making. Individuals charged with determining the future of people's lives — from juries to judges — must have total faith that transcripts reflect the actual stated words and/or testimony of those involved in or presenting a case.

AI and its subset technologies have no loyalty to the rule of law and no ability to perceive and interpret nuance or emotional expression. Although exciting in their abilities to achieve tasks such as processing mass data, none has the ability (as yet) to provide risk-free and near-total accuracy in capturing, transcribing, and protecting the words of all people regardless of gender, race, national origin, or age.

In recognizing AI's serious risks and fallibility, the ABA and many of its specialty sections have studied and passed numerous related policies that acknowledge innovative opportunities but strongly caution users and developers about the real or possible harmful impacts on insurance, privacy, and cybersecurity, to name a few sectors.

In February 2023, the ABA adopted Resolution 604 calling on organizations that design, develop, deploy, and use AI to follow three key guidelines: (1) ensure their products are subject to human authority, oversight, and control; (2) ensure accountability measures if developers have not taken reasonable steps to mitigate harm or injury; and (3) provide transparency and traceability for their products. Resolution 604 also encourages federal and state lawmakers and policymakers to follow the same standards in AI policymaking.

A universal thread throughout these statements, resolutions, and reports is an urgent call to action to decision-makers that "responsible individuals and organizations should be accountable for the consequences caused by their use of AI products, services, systems, and capabilities, including any legally cognizable injury or harm caused by their actions or use of AI systems or capabilities, unless they have taken reasonable measures to mitigate against that harm or injury."[38]

NCRA continues to direct attention to the extreme legal risks associated with the use of AI, ASR, and digital recording in today's courts and deposition rooms. However, misinformation about speed, safety, accuracy, accountability, and cost savings continues to flourish.

- *Predictions that digital recording and AI can increase efficiency at lower cost are simply not supported by the facts.* Digital recording systems require multiple individuals to monitor and maintain the systems, incur additional storage costs, experience undetected malfunction, and need teams of far less efficient transcriptionists to produce transcripts than skilled court reporters.
- *Traceability is considered a key element for trustworthy AI.* Traceability relates to the need to maintain a complete account of the provenance of data, process, and artifacts involved in the production of transcripts that incorporate an AI model. Without traceability, AI should not be used in the production of certified court or deposition transcripts.
- *Inequalities in automated voice recognition translation affect access to justice for already marginalized communities* such as immigrants and people of color.

In May 2020**,** NCRA appointed the STRONG Committee to undertake a comprehensive study that included review of scholarly articles and thousands of pages dedicated to the science and technologies of AI and ASR.

After reviewing the work of this committee, NCRA adopted the following resolution:

> NOW, THEREFORE, BE IT RESOLVED that the National Court Reporters Association urges that lawyers, bar associations, courts, and federal communication regulatory agencies should ensure that digital court reporter or transcriptionist products, services, systems, and capabilities are subject to human authority, oversight, and control to verify the chain of custody of the official record when use of such technology may fail to protect the privacy of litigants and could erode the public's confidence, trust, and faith in the fairness and legitimacy of the judicial system, and that
>
> 1) Organizations that design, develop, deploy, and use artificial intelligence and automatic speech recognition systems and capabilities must be subject to human authority, oversight, and control.
>
> 2) Responsible individuals and organizations should be accountable for the consequences caused by their use of AI products, services, systems, and capabilities.
>
> 3) All individuals participating in legal proceedings should be duly advised if AI or ASR will be utilized in the production of transcripts. Appropriate cautions of the risks and dangers the use of such technology poses to biometric and private information should be disclosed. Each individual involved in legal proceedings should be allowed to decide whether they wish to opt in or out of being subjected to its use.
>
> BE IT FURTHER RESOLVED, that the National Court Reporters Association urges Congress, federal executive agencies, and state legislatures and regulators, courts, lawyers, court reporting firms, consortiums, and associations, together with law firms and bar associations and broadcasting companies, to follow these guidelines in legislation and standards pertaining to the use of AI and ASR in court and legal environments.

Success cannot be measured by short-term budgetary considerations but instead should be measured by honest, equal, and fair treatment for all parties. Increased costs combined with lack of oversight, security flaws, poorly trained personnel, and equipment failures cannot equal or exceed the performance of a human stenographic reporter or captioner.

The November 2023 publication of this white paper is the first of what is expected to be a series of ongoing updates and documents about emerging ethical and legal issues related to the use of AI, ASR, voice cloning, and digital audio recording of legal proceedings. Due to the fast-changing pace of development, use, and potential harms related to these issues, NCRA acknowledges that this is an inherently dynamic paper subject to future changes

VII. Endnotes

[1] Federal Rules of Appellate Procedure Rule 10. Cornell Law School, Legal Information Institute. Last accessed Sept. 29, 2023: https://www.law.cornell.edu/rules/frap/rule_10

[2] Sones, Z. "What is Audio Compression?" Aug. 18, 2022. The Beat. Last accessed Oct. 24, 2023: https://www.premiumbeat.com/blog/what-is-audio-compression

[3] Gangwar, D. P., and Pathania, A. "Authentication of Digital Audio Recording Using File's Signature and Metadata Properties" (2020). *International Journal of Engineering Applied Sciences and Technology 5(3): 162-165*. Last accessed Oct. 26, 2023: https://www.ijeast.com/papers/162-165,Tesma503,IJEAST.pdf

[4] "The Case Against Digitally Recorded Evidence." June 20, 2016. FindLaw. Last accessed Sept. 28, 2023: https://www.findlaw.com/legal/technology/modern-law-practice/the-case-against-digitally-recorded-evidence.html

[5] Scientific Working Group on Digital and Multimedia Evidence (SWGDE). Best Practices for Forensic Audio (2022). Vol. V 2.5. Last accessed Sept. 26, 2023: https://drive.google.com/file/d/1zF0KzO5Xe5jAO2CgLxISIm8fLSFJ46ax/view

[6] Damiani, J. "A Voice Deepfake Was Used to Scam A CEO Out of $243,000." September 3, 2019, *Forbes*. Last accessed Sept. 28, 2023: https://www.forbes.com/sites/jessedamiani/2019/09/03/a-voice-deepfake-was-used-to-scam-a-ceo-out-of-243000/?sh=79c590f12241

[7] Lukken, A. "Serving a Subpoena Abroad? Not So Fast, Counsel." April 18, 2016. Hague Law Blog. Last accessed Oct. 24, 2023: http://www.vikinglaw.us/2016/04/18/serving-a-subpoena-abroad-not-so-fast-counsel/#:~:text=A%20subpoena%E2%80%99s%20coercive%20effect%20is%20revived%20only%20by,crosses%20an%C2%A0internationalboundary%2C%20it%20cannot%20regain%20its%20coercive%20effect.%2A

[8] Jaafari, J. D., and Lewis, N. "In Court, Where Are Siri and Alexa?" Feb. 14, 2019. The Marshall Project. Last accessed Sept. 28, 2023: https://www.themarshallproject.org/2019/02/14/in-court-where-are-siri-and-alexa

[9] American Bar Association Cybersecurity Legal Task Force Antitrust Law Section, 2023.

[10] Buchman, M., and Pierce, M. "Make Sure Your Court Reporter Is Really a Court Reporter," April 13, 2022. *Los Angeles & San Francisco Daily Journal.* Last accessed Sept. 28, 2023: https://www.thejcr.com/2022/04/19/make-sure-your-court-reporter-is-really-a-court-reporter

[11] The Race Gap in Speech Recognition Technology." *Fair Speech*. Stanford University. No date. Last accessed Sept. 29, 2023: https://fairspeech.stanford.edu

[12] NAACP, Criminal Justice Fast Sheet. No date. Last accessed Oct. 23, 2023: https://naacp.org/resources/criminal-justice-fact-sheet

[13] "AI Translation Is Jeopardizing Afghan Asylum Claims," April 19, 2023. *Rest of World*. Last accessed Sept. 27, 2023: https://restofworld.org/2023/ai-translation-errors-afghan-refugees-asylum

[14] Crawford, C. "A Study of Court Reporting and Digital Recording (DR) in the California and Florida Courts." Dec. 3, 2009. *Justice Served*. California Court Reporters Association. Last accessed Sept. 29, 2023: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.cal-ccra.org/assets/documents/Justice_Served-CCRA_Dec09.pdf

[15] Pierce County Superior Court, November 8, 2018. Department Budget Presentation. https://online.co.pierce.wa.us/cfapps/council/model/otDocDownload.cfm

[16] Greenwood, J. M., Horney, J., Jacoubovitch, M. D., Lowenstein, F.B., and Wheeler, R. R. "A Comparative Evaluation of Stenographic and Audiotape Methods for United States District Court Reporting." 1983. Federal Judicial Center, p. 80. Last accessed Sept. 27, 2023: https://www.ojp.gov/ncjrs/virtual-library/abstracts/comparative-evaluation-stenographic-and-audiotape-methods-united

[17] Suskin, L., McMillan, J., and Hal, D. "Making the Record: Utilizing Digital Electronic Recording." September 2013. National Center for State Courts. Last accessed Oct. 23, 2023: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.ncsc.org/__data/assets/pdf_file/0021/17814/09012013-making-the-digital-record.pdf

[18] "How Long Does It Take to Transcribe One Hour of Audio or Video?" No date. Rev. Last accessed Sept. 28, 2023: https://www.rev.com/blog/resources/how-long-does-it-take-to-transcribe-audio-video

[19] New York, Part 108 Format of Court Transcripts and Rates of Payment Thereof, 108.2(b)(2)(iii). Last accessed Sept. 29, 2023: https://ww2.nycourts.gov/rules/chiefadmin/108.shtml

[20] Ibid. See Suskin, McMillan, and Hal.

[21] Samani, R. "Is Cloud Security an Exaggerated Concern?" April 22, 2016. McAfee. Last accessed Oct. 24, 2023: https://www.mcafee.com/blogs/other-blogs/executive-perspectives/cloud-security-exaggerated-concern

[22] Veltman, C. "Send in the Clones: Using Artificial Intelligence to Digitally Replicate Human Voices." Jan. 17, 2022. NPR. Last accessed Sept. 28, 2023: https://www.npr.org/2022/01/17/1073031858/artificial-intelligence-voice-cloning

[23] Thompson, K. "AI Enables Laryngectomy Patients to Get Their Voice Back." April 13, 2022. *Create Engineering Ideas into Reality*. Last accessed Sept. 27, 2023: https://createdigital.org.au/ai-enables-laryngectomy-patients-to-get-their-voice-back

[24] Deepfake Act of 2019 (S. 2065). 116th Congress (2019-2020), passed Senate Oct. 24, 2019. Congress.gov, Library of Congress. Last accessed Sept. 29, 2023: https://www.congress.gov/bill/116th-congress/senate-bill/2065/all-info An identical bill, introduced

in the U.S. House of Representatives as H.B. 3600, was referred to the House Energy and Commerce Committee's Subcommittee on Consumer Protection and Commerce Oct. 29, 2019.

[25] Shepardson, D. "U.S. Senator Urges AI Company CEOs to Take Steps to Address Risks." April 26, 2023. Reuters. Last accessed Sept. 28, 2023: https://www.reuters.com/technology/us-senator-urges-ai-company-ceos-take-steps-address-risks-2023-04-26

[26] Lehman, K., Edson, S., and Smith, V. "5 Ways To Confront Potential Deepfake Evidence In Court." *Law360*. Subscription required: https://www.law360.com/articles/1181306/5-ways-to-confront-potential-deepfake-evidence-in-court

[27] Washington GR 35 Adopted effective Sept. 1, 2015. Amended effective Sept. 1, 2018.

[28] American Bar Association House of Delegates, Resolution 604. Published Feb. 6, 2023. Last accessed Oct. 24, 2023: chrome extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.txmca.org/fileman/Uploads/Symposium%20Materials/2023/Susan%20Guthrie%20AI/ABA_604_midyear_2023_Resolution_on_AI.pdf

[29] Ibid. See Stanford University.

[30] Martin, J., and Wright, K. E. **"**Bias in Automatic Speech Recognition: The Case of African American Language," August 2023 (Published Dec. 14, 2022). *Applied Linguistics, Volume 44, Issue 4, pp. 613-630*. Last accessed Sept. 27, 2023: https://academic.oup.com/applij/article/44/4/613/6901317 or https://doi.org/10.1093/applin/amac066 and http://www.ethicsinnlp.org/workshop/pdf/EthNLP06.pdf

[31] Werner, L., Huang, G., and Pitts, B. "Automated Speech Recognition Systems and Older Adults: A Literature Review and Synthesis." *Proceedings of the Human Factors and Ergonomics Society 2019 Annual Meeting.* Purdue University. Last accessed Sept. 26, 2023: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://journals.sagepub.com/doi/pdf/10.1177/1071181319631121 or https://journals.sagepubs/werner-et-al-2019-automat_ture-review-and-synthesis.pdf

[32] RCW 42.45.230€. Washington state government. Adopted effective Oct. 1, 2020. Page list last accessed Sept. 29, 2023: https://app.leg.wa.gov/rcw/default.aspx?cite=42.45

[33] National Court Reporters Association, State Certification Requirements. Last accessed Sept. 26, 2023: https://www.ncra.org/home/professionals_resources/ncra-information-and-resource-center/state-resources/State-Certification-Requirements

[34] Delfina, R. A. "Deepfakes on Trial: A Call to Expand the Trial Judge's Gatekeeping Role to Protect Legal Proceedings from Technological Fakery" (2023). 74 *Hastings L.J.* 293. Last accessed Sept. 28, 2023: https://repository.uchastings.edu/hastings_law_journal/vol74/iss2/3

[35] Chasse, K. "The Admissibility of Electronic Business Records." (2010) 8:2 *CJLT*. Last accessed Sept. 29, 2023: https://digitalcommons.schulichlaw.dal.ca/cjlt/vol8/iss2/1/#:~:text=Ken%20Chasse%2C%20%22The%20Admissibility%20of%20Electronic%20Business%20Records%22%20(2010)%208%3A2

%20CJLT. Chasse also refers to the nine points of proof specified in the National Standard of Canada, Electronic Records as Documentary Evidence CAN/CGSB-72.34-2005, Section 5.5.

[36] Mason, S., and Stanfield, A. *Authenticating Electronic Evidence*, 2017. Stanfield, School of Advanced Study, University of London Institute of Advanced Legal Studies, p.p. 193-260. Last accessed Sept. 29, 2023: https://www.jstor.org/stable/j.ctv512x65.14

[37] Jones, J. "Supreme Court Trust, Jobs Approval at Historical Lows." (2022, Sept. 29). Gallop. https://news.gallup.com/poll/402044/supreme-court-trust-job-approval-historical-lows.aspx

[38] American Bar Association Cybersecurity Legal Task Force Antitrust Law Section, 2023.

Acknowledgments

The National Court Reporters Association expresses its sincere gratitude to the NCRA STRONG Committee for contributing to the research and creation of this white paper. Without the committee's invaluable efforts and support, this work would not have been possible.

First and foremost, NCRA deeply appreciates work by the following individuals whose dedication and expertise shaped the content and insights contained herein, and whose combined experience in the stenographic court reporting profession encompasses 525 years and spans 11 states:

Sue A. Terry, FAPR, RPR, CRR, CRC (Ohio), Chair, NCRA STRONG (48 years in the profession)

Stefanie R. Allison, RPR (Nebraska) (25 years)

Douglas Bettis (Ohio) (25 years)

Lisa Migliore Black, CCR (Kentucky), Vice-Chair, NCRA STRONG (26 years)

Christopher Day (New York) (13 years)

Debbie Dibble, RDR, CRR, CRC (Utah) (33 years)

Kimberly Falgiani, RDR, CRR, CRC, CSR (HI) (Ohio) (43 years)

Lillian M. Freiler, FAPR, RMR, CMRS (Pennsylvania) (48 years)

Elizabeth A. Harvey, FAPR, RPR (Washington) (27 years)

Jo Ann Holmgren, CCR (Texas) (38 years)

Andrea Kreutz, CLVS (Iowa) (8 years)

Phyllis Craver Lykken, FAPR, RPR, WA CCR, OR CSR (Washington) (43 years)

Mary E. Pierce, CSR (California) (40 years)

Stacey E. Raikes, RMR, CRR (Florida) (26 years)

Lin D. Riffle, RDR, CRR, CRC (Ohio) (36 years)

Lindsay Stoker, RMR, CRR, CRC (California) (16 years)

Dineen Squillante, RPR (Vermont) (30 years)

Their commitment to excellence and tireless efforts in researching, writing, and revising this document have been instrumental in producing a high-quality resource.

Keywords: legal transcription, automatic speech recognition, bias, courts, transcription, transcription errors, court record, privacy, stenographer, transcript security, voice recognition, justice protection, justice reform, courts and artificial intelligence, audio transcription, civil liberties, ASR, biometric privacy, audio biometrics, digital audio, discrimination in courts, electronic recording, electronic recording errors, FTR, JAVS, BIS, court electronic vendor, court electronic recording vendor, transcript quality control, ASR perturbations, AI security, AI ethics, AI accuracy, speech-to-text accuracy, transcription bias, transcription errors in court transcripts, courtroom technology