



---

2020

## The Impact of Artificial Intelligence on Forensic Accounting and Testimony—Congress Should Amend "The Daubert Rule" to Include a New Standard

Victor Nicholas A. Metallo

Follow this and additional works at: <https://scholarlycommons.law.emory.edu/elj-online>

---

### Recommended Citation

Victor N. Metallo, *The Impact of Artificial Intelligence on Forensic Accounting and Testimony—Congress Should Amend "The Daubert Rule" to Include a New Standard*, 69 Emory L. J. Online 2039 (2020).  
Available at: <https://scholarlycommons.law.emory.edu/elj-online/3>

This Essay is brought to you for free and open access by the Journals at Emory Law Scholarly Commons. It has been accepted for inclusion in Emory Law Journal Online by an authorized administrator of Emory Law Scholarly Commons. For more information, please contact [law-scholarly-commons@emory.edu](mailto:law-scholarly-commons@emory.edu).

**THE IMPACT OF ARTIFICIAL INTELLIGENCE ON  
FORENSIC ACCOUNTING AND TESTIMONY—CONGRESS  
SHOULD AMEND “THE DAUBERT RULE” TO INCLUDE A  
NEW STANDARD**

*Victor Nicholas A. Metallo\**

ABSTRACT

This Essay attempts to address the current issues and legal implications surrounding the use of artificial intelligence by forensic accounting experts and its importance to forensic accounting research. It reviews existing law, proposes changes to the Federal Rules of Evidence for using artificial intelligence in the courtroom, and covers emerging technology a forensic accountant may encounter, such as blockchain, cryptocurrency, “smart contracts,” machine learning, and algorithmic entities. Finally, the Essay concludes that the changes to the rules should encompass standards to account for artificial intelligence reliability and argues forensic accounting experts and all forensic experts are needed even more in light of this new technology to assist the trier of fact in its deliberations.

---

\* Teaches Business Law and Ethics at Seton Hall University, Stillman School of Business, and Montclair State University, Feliciano School of Business; L.L.M., Georgetown University Law Center (candidate); J.D., Seton Hall University (also studied at Ave Maria School of Law); M.L.I.S., Rutgers University; M.B.A., St. John’s University Tobin School of Business; M.A.E., Seton Hall University; B.A., Seton Hall University. I would like to thank God, my family, friends, colleagues, students, my good friend James Yang, Professor Emeritus, Montclair State University, and my colleague Jim DiGabriele for their support and inspiration, and the great editorial staff of *Emory Law Journal* for making this publication possible. *AMDG*.

INTRODUCTION .....	2041
I. OVERVIEW OF THE FEDERAL RULES OF EVIDENCE; AND THE <i>DAUBERT</i> AND <i>FRYE</i> STANDARDS GOVERNING FORENSIC ACCOUNTING EXPERT TESTIMONY .....	2041
II. THE IMPACT OF AI TECHNOLOGY ON FORENSIC ACCOUNTING EXPERT TESTIMONY .....	2049
A. <i>Machine Testimony and the Rise of Algorithmic Entities</i> .....	2049
B. <i>Forensic Accounting: Legal Implications Surrounding AI             and Auditing</i> .....	2056
III. PROPOSED CHANGES TO THE <i>DAUBERT</i> RULE TO INCLUDE STANDARDS ADDRESSING AI AND FORENSIC EXPERT TESTIMONY .....	2059
A. <i>Rule 702 Should Be Amended to Include Reliability Requirements             for AI and Reestablish the Role of the Human Expert             Witness</i> .....	2060
B. <i>Forensic Experts are Still Necessary to Juries to Provide             “Reasonableness Checks” Against AI Conclusions and to Explain             AI’s Limitations</i> .....	2061
CONCLUSION .....	2062

## INTRODUCTION

Artificial intelligence (AI) is a technological development that will inevitably impact the law and the forensic accountant as an expert witness. A forensic accountant, as well as any expert, is essential for the successful prosecution of cases. Because cases are not always cut and dry, oftentimes forensic accountants have to ferret out the good data from the bad, which can be expensive and time consuming. The use of AI may offer a more efficient means to carry out that task. As a result, courts, practitioners, and forensic accounting experts will need to adapt to the emerging technology and understand how it will be utilized by a jury in making decisions.

Because forensic accountants serve the important role as expert witnesses, the continuous adaptation to AI technology within the legal system will be relevant and pertinent to forensic accounting research. Furthermore, forensic accounting research will be impacted by how forensic accountants utilize AI within a legal environment that is constantly changing. This Essay attempts to address the various issues practitioners and forensic accounting experts will experience when involving AI in light of the historical use of expert testimony in litigation. Although forensic accountants are the subject of this Essay, any changes to the federal rules would naturally affect all forensic expert testimony of various stripes whose factual conclusions rely in part upon AI.

Part I of this Essay will examine the *Daubert* and *Frye* standards and the development of Federal Rules 702, 703, and 704. Part II will analyze the emergence of new technologies, such as blockchain, “smart contracts,” and algorithmic entities, including their impact on forensic accounting investigation and testimony. Part III will examine and propose changes to the *Daubert* rules to include standards addressing AI and forensic expert testimony. Finally, in Part IV, this Essay will conclude the forensic accountant is even more needed in light of this new technology as a necessary intermediary between the data, the findings, and the jury. This Essay will present an argument that reliance upon AI alone is insufficient to arrive at just and equitable outcomes.

### I. OVERVIEW OF THE FEDERAL RULES OF EVIDENCE; AND THE *DAUBERT* AND *FRYE* STANDARDS GOVERNING FORENSIC ACCOUNTING EXPERT TESTIMONY

An overview and discussion of current legal standards involving expert witnesses, including forensic accounting testimony, are first presented to provide context to the proposed rule changes as a result of emerging

technologies. Expert witness testimony and its admissibility in federal court is generally guided by Federal Rules 702, 703, and 704. Federal Rule 702 provides:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.<sup>1</sup>

Federal Rule 703 is grounded on the notion the expert must be “personally” involved in discovering and studying the facts. Rule 703 states:

An expert may base an opinion on facts or data in the case that the expert has been made aware of or personally observed. If experts in the particular field would reasonably rely on those kinds of facts or data in forming an opinion on the subject, they need not be admissible for the opinion to be admitted. But if the facts or data would otherwise be inadmissible, the proponent of the opinion may disclose them to the jury only if their probative value in helping the jury evaluate the opinion substantially outweighs their prejudicial effect.<sup>2</sup>

Finally, Rule 704 relaxes the “ultimate issue” responsibility that is relegated to the trier of fact, whether it be a judge or a jury, and gives the expert some latitude:

**(a) In General—Not Automatically Objectionable.** An opinion is not objectionable just because it embraces an ultimate issue.

**(b) Exception.** In a criminal case, an expert witness must not state an opinion about whether the defendant did or did not have a mental state or condition that constitutes an element of the crime charged or of a defense. Those matters are for the trier of fact alone.<sup>3</sup>

Federal trial courts apply the rules guided by the decisions handed down by the Supreme Court; yet, the granddaddy of these precedents is *Frye v. United States*, a D.C. Circuit Court of Appeals case decided in 1923.<sup>4</sup> *Frye* involved an

---

<sup>1</sup> FED. R. EVID. 702.

<sup>2</sup> FED. R. EVID. 703.

<sup>3</sup> FED. R. EVID. 704.

<sup>4</sup> 293 F. 1013 (D.C. Cir. 1923).

appeal from a second-degree murder conviction.<sup>5</sup> Defendant Frye argued the trial court denied him a defense by not permitting him to use an expert witness to explain the results of a “systolic blood pressure deception test,”<sup>6</sup> which is the precursor to the infamous lie detector test.<sup>7</sup> In addition to proffering the expert, the defendant offered to undergo a test in front of the jury.<sup>8</sup> But the trial court ruled for the state, reasoning there was not enough scientific support behind the conclusions of these tests.<sup>9</sup> The court held:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have *gained general acceptance* in the particular field in which it belongs.<sup>10</sup>

The resulting rule, which many courts have followed, is that any methodology an expert witness relies upon must be “generally accepted” by the expert community in the field.<sup>11</sup> But Congress superseded the *Frye* rule by enacting the Federal Rules of Evidence, essentially doing away with the “general acceptance” standard.<sup>12</sup>

Fast forward seventy years to 1993, where the Supreme Court of the United States laid down the bedrock principle in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, guiding lower courts on the enacted rules surrounding the admissibility of expert witness testimony.<sup>13</sup> Noting the congressionally mandated evidentiary rules replaced the rigidity of the “general acceptance” *Frye* standard, the Court opined:

---

<sup>5</sup> *Id.*

<sup>6</sup> *Id.* at 1014.

<sup>7</sup> Christine Funk, *Daubert Versus Frye: A National Look at Expert Evidentiary Standards*, EXPERT INST. (Mar. 13, 2018), <https://www.theexpertinstitute.com/daubert-versus-frye-a-national-look-at-expert-evidentiary-standards/>.

<sup>8</sup> *Frye*, 293 F. at 1014.

<sup>9</sup> *Id.*

<sup>10</sup> *Id.* (emphasis added).

<sup>11</sup> *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 587 (1993).

<sup>12</sup> FED. R. EVID.; *see also* U.S. CONST. art. III, § 2, cl. 2 (giving Congress the power to regulate the jurisdiction of the courts under the “Exceptions Clause” of Article III.); *Daubert*, 509 U.S. at 589 n.6; SARAH HERMAN PECK, CONG. RESEARCH SERV., R44967, CONGRESS’S POWER OVER COURTS: JURISDICTION STRIPPING AND THE RULE OF *KLEIN* 1 (2018).

<sup>13</sup> *Daubert*, 509 U.S. at 582 (noting the Court’s duty to interpret “the standard for admitting expert scientific testimony in a federal trial”).

[It] does not mean, however, that the Rules themselves place no limits on the admissibility of purportedly scientific evidence. Nor is the trial judge disabled from screening such evidence. To the contrary, under the Rules the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.<sup>14</sup>

In *Daubert*, the plaintiffs sued Merrell Dow claiming its drug, Bendectin, caused birth defects in their children.<sup>15</sup> Merrell Dow succeeded in a summary judgment motion below on the basis of one expert's opinion, which in essence denied the plaintiffs a trial on the merits.<sup>16</sup> The district court held against the plaintiffs, essentially upholding the *Frye* standard and reasoning the plaintiffs' eight experts' conclusions did not show "general acceptance" within the field.<sup>17</sup>

Given all the studies surrounding Bendectin, the district court opined that the experts' opinions were "not based on epidemiological evidence [and therefore not] admissible to establish causation,"<sup>18</sup> which is a question for the jury. In a products liability lawsuit, such as the one in *Daubert*, several legal theories are advanced, including strict liability and negligence.<sup>19</sup> "Causation" is an element of a negligence case where a jury is instructed to find whether a defendant's conduct (action or inaction) was a direct and proximate result of the injury.<sup>20</sup> A jury may also find that a defendant is strictly liable, which means the defendant is responsible for the tort, for example, the defendant sold or made a defective product that injured the plaintiff.<sup>21</sup>

The district court reasoned the animal-cell studies "could not raise by themselves a reasonably disputable jury issue regarding causation."<sup>22</sup> Plaintiffs' experts' "epidemiological analyses, based as they were on recalculations of data in previously published studies that had found no causal link between the drug and birth defects, were ruled to be inadmissible because they had not been published or subjected to peer review."<sup>23</sup> The U.S. Court of Appeals for the

---

<sup>14</sup> *Id.* at 589.

<sup>15</sup> *Id.* at 582.

<sup>16</sup> *Id.* at 583. Summary judgment motions are pre-trial motions, which are difficult to win due to the high standards applied by a court. The intent of summary judgment is to balance the time and efficiency constraints on an overburdened court system with the constitutional rights of a plaintiff to due process and a fair trial.

<sup>17</sup> *Id.* at 586.

<sup>18</sup> *Id.* at 583-84.

<sup>19</sup> See generally STUART M. SPIESER ET AL., *THE AMERICAN LAW OF TORTS* (1983).

<sup>20</sup> *Id.*

<sup>21</sup> In a negligence lawsuit, the defendant has a chance to avoid liability by successfully showing the defendant acted reasonably under the circumstances. In a strict liability lawsuit, the defendant's "defenses" are generally limited.

<sup>22</sup> *Daubert*, 509 U.S. at 584.

<sup>23</sup> *Id.*

Ninth Circuit affirmed that an “expert opinion based on a methodology that diverges ‘significantly from the procedures accepted by recognized authorities in the field ... cannot be shown to be generally accepted as a reliable technique.’”<sup>24</sup> The Supreme Court reversed, holding that “the *Frye* test was superseded by the adoption of the Federal Rules of Evidence.”<sup>25</sup>

The Constitution, the general statement of the federal civil law,<sup>26</sup> supersedes statutes, and since the Constitution establishes a republic with three co-equal branches of government, statutes passed by both Congress and the President supersede common law, or judge-made law, upon which the *Frye* test essentially was based. Rule 401 of the Federal Rules of Evidence states that all relevant evidence (evidence that tends to prove or disprove the probability of a fact in question) will be admitted by the trial judge for the jury to consider.<sup>27</sup> Therefore, in a products liability lawsuit, a basic fact in question before a jury is whether the defendant was negligent, or as in the case of *Daubert*, in manufacturing and selling Bendectin. Expert testimony would be relevant to a jury determining whether Merrell Dow was liable.

The Court noted there is nothing in Federal Rule 702 that mentions “general acceptance” in the community of the discipline,<sup>28</sup> making the rigid *Frye* rule irrelevant in federal lawsuits. But the Court also recognized the gate-keeping function of a trial judge and acknowledged under the rule “the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.”<sup>29</sup> The purpose of Rule 702 is to assist a “trier of fact” (and in most cases, the “trier of fact” is a jury) with the expert’s knowledge and expertise.<sup>30</sup> The rule is not meant to have courts affirm or disaffirm scientific principles and methods, or even to act as a check on the scientific method as it is used within a scientific discipline.

Depending on the case, expert testimony may rely upon scientific knowledge.<sup>31</sup> The Court reasoned the phrase “scientific knowledge” is not simply a repository of knowledge of the physical world *per se*, but scientific knowledge is a process of knowing, explaining, and validating the physical world based on “good grounds,” thereby “establish[ing] a standard of

---

<sup>24</sup> *Id.* (quoting *Daubert v. Merrell Dow Pharm. Inc.*, 951 F.2d 1128, 1130 (9th Cir. 1991)).

<sup>25</sup> *Id.* at 587.

<sup>26</sup> The Constitution is primarily based on the natural law, which supersedes civil law or human-made law.

<sup>27</sup> *Daubert*, 509 U.S. at 587.

<sup>28</sup> *Id.* at 588–89.

<sup>29</sup> *Id.* at 589.

<sup>30</sup> *Id.* at 588.

<sup>31</sup> *Id.* at 589–90 (quoting FED. R. EVID. 702).

evidentiary reliability.”<sup>32</sup> Expert testimony, therefore, must be grounded in facts that are relevant to the issues in the case, otherwise it is useless to the jury.<sup>33</sup>

The Court used the example of the phases of the moon to explain the doctrine of relevance.<sup>34</sup> Thus, if a jury needs to resolve how dark it was on a given night because “darkness” is relevant to a case, an expert’s testimony would be helpful there; however, an expert’s testimony would not be relevant to the question of whether it was likely the defendant “behaved irrationally that night.”<sup>35</sup> The promulgation of Rules 703 and 704, which give the expert “wide latitude to offer opinions including those that are not based on firsthand knowledge or observation,” lends even more support that the “general acceptability” standard is moot.<sup>36</sup>

Finally, the Court considered whether the expert’s “theory or technique” has been “peer reviewed.”<sup>37</sup> “Publication (which is but one element of peer review) is not a *sine qua non* of admissibility; it does not necessarily correlate with reliability, and in some instances well-grounded but innovative theories will not have been published.”<sup>38</sup> Some theories are too new for publication or maybe lack interest by peers; nevertheless, the fact they are not published is not dispositive as to whether they are relevant or admissible.<sup>39</sup> This is not to say using peer reviewed methods is not good practice or desirable, since having other experts in the field review and weigh-in on theories and approaches can help mitigate flaws in methodologies and improve upon them.<sup>40</sup> Therefore, “publication (or lack thereof) in a peer reviewed journal thus will be a relevant, though not dispositive, consideration in assessing the scientific validity of a particular technique or methodology on which an opinion is premised.”<sup>41</sup>

Expert testimony must be reliable and relevant, and the legal system has many tools to ferret out irrelevant evidence. The best tool in an attorney’s arsenal is cross-examination, which is permitted in court because of the constitutionally guaranteed right of a party to witness confrontation.<sup>42</sup> Experts proffered by a

---

<sup>32</sup> *Id.* at 590.

<sup>33</sup> *Id.* at 591 (citations omitted).

<sup>34</sup> *Id.*

<sup>35</sup> *Id.* at 591–92.

<sup>36</sup> *Id.* at 592.

<sup>37</sup> *Id.* at 593.

<sup>38</sup> *Id.*

<sup>39</sup> *Id.*

<sup>40</sup> *Id.*

<sup>41</sup> *Id.* at 594; *Symposium, infra* note 48, at 1471 (“Peer review does not guarantee that the method is right or has been proved.”).

<sup>42</sup> U.S. CONST. amend. VI.

party will be subject to cross-examination, and their theories and conclusions will be subject in a sense to the “peer review” of the opposing side’s expert’s scrutiny. Directed verdicts and summary judgments can end a case early if the expert’s opinion amounts to net opinions or are deemed irrelevant opinions. Finally, the appeals process will review whether the trial judge abused his or her discretion in those determinations.

In addition to the truth-searching procedures and techniques mentioned above, judges, in their role, serve as “gatekeepers” to the evidence a jury ought to hear. In *Kumho Tire Co. v. Carmichael*,<sup>43</sup> the Court reaffirmed a trial court’s “gatekeeping” function and held the *Daubert* standard applied not only to testimony based on scientific knowledge but also to testimony based on “technical” and “other specialized” knowledge,<sup>44</sup> which includes forensic accounting. The Court ruled the *Daubert* factors are not exhaustive and a court may consider one or more of the factors when performing its “gatekeeping” role.<sup>45</sup> The reliability test is “flexible,” and the factors may or may not apply to every expert in every case.<sup>46</sup> But it is worth noting *Daubert* and *Kumho* apply to federal lawsuits and not necessarily state actions. States, therefore, have the option of accepting or rejecting these standards and some of them have chosen to keep the *Frye* standard in some areas and *Daubert* in others.<sup>47</sup> Accordingly, what evidence is presented and admitted is generally up to the attorneys and the court.

In 2018, Fordham University Law School hosted the “Symposium on Forensic Expert Testimony, Daubert, and Rule 702.”<sup>48</sup> The focus of the Symposium was to improve the use of forensic evidence within the court system in the aftermath of *Daubert* and *Kumho* and to consider whether the rules should be revisited.<sup>49</sup> Panelists reinforced the notion that the relevance of an expert’s opinion to the case is not enough, but the expert’s analysis must be grounded in reliable methods.<sup>50</sup> For example, fingerprint and firearms evidence are considered to be “subjective,” and therefore, several of the panelists believe empirical evidence is needed to support those findings.<sup>51</sup>

---

<sup>43</sup> 526 U.S. 137 (1999).

<sup>44</sup> *Kumho*, 526 U.S. at 141.

<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> Funk, *supra* note 7 (list of various states and standards).

<sup>48</sup> *Symposium on Forensic Expert Testimony Daubert, and Rule 702*, 86 FORDHAM L. REV. 1463, 1463 (2018).

<sup>49</sup> *Id.*

<sup>50</sup> *Id.* at 1467.

<sup>51</sup> *Id.* at 1471.

Experts suggested AI could be used to enhance the accuracy of these examinations and make them more objective.<sup>52</sup> Several experts who participated in the Symposium focused on the objectivity of data results, where the more objective the methods an expert used in their review of a case, the less likely bias would enter the analysis.<sup>53</sup>

There was conjecture among Symposium presenters over whether Rule 702 should be changed to account for the changes in technology or whether the rule is simply being misapplied in terms of permitting experts to opine on things without sufficient training.<sup>54</sup> For example, statistics, as a sub-discipline of mathematics, is often used in many of the forensic sciences; however, because Rule 702 says a witness is qualified as an expert by “knowledge, skill, experience, [or] training,” statisticians are not permitted to testify as an expert in biology, for example, where a biologist may be needed to testify about DNA samples.<sup>55</sup> But a biologist may testify as to “error rates” in the samples.<sup>56</sup>

In other words, one of the criticisms is the rule may not prevent all experts from testifying outside his or her field.<sup>57</sup> But this may present an opportunity for AI to assist in areas where multiple experts would be needed. Having too many experts testifying can be confusing to a jury yet having too few can lead to inaccurate information.

The discussion turned toward machine evidence and its reliability, particularly how familiar experts are expected to be concerning the functions of machines.<sup>58</sup> Professor Erin Murphy drew a distinction between machines that can perform a human function faster, like a calculator, versus “machine-generated evidence that [does not] actually reproduce or speed up what humans

---

<sup>52</sup> *Id.*

<sup>53</sup> *Id.*

<sup>54</sup> *Id.* at 1471–72.

<sup>55</sup> *Id.* at 1472.

<sup>56</sup> Karen Kafadar, *The Critical Role of Statistics in Demonstrating the Reliability of Expert Evidence*, 86 *FORDHAM L. REV.* 1617, 1619 (2018) (“Rule 702 seems to allow any ‘expert’ to draw inferences from data—which could arise from biased collections rather than from representative samples from the relevant population—even if that expert’s knowledge of statistics is nonexistent.”).

<sup>57</sup> *Id.* at 1474 (“Courtroom testimony right now does not comport with statistical reliability.... Data analysis and interpretation do require some statistical expertise, more than a little. One or two courses in statistics no more makes a statistical expert than my two or three courses in chemistry would make me a chemist. I don’t believe that nonstatisticians should be allowed to be providing expert testimony when it comes to the analysis of data. Relying on models is almost always necessary, but it can be tricky, and so you have to look at several of them. Opinions are not database conclusions, and experts, in my opinion, should be disclosing all the facts and data related to how they came up with their opinions.”).

<sup>58</sup> *Id.* at 1514.

do, [but] it creates unique knowledge.”<sup>59</sup> Professor Murphy suggested the rules could be amended to reflect a “*Daubert*-style test where the machine is the unique source of knowledge, where the human being might be just a vector delivering that knowledge, including elevating the ideas of transparency in each of those pieces and disaggregating all those pieces.”<sup>60</sup> Rule 403, which permits judges to exclude evidence that may prejudice the jury, could also mitigate against an expert coming into court and merely relying upon machines as scriveners of that evidence.<sup>61</sup>

The discussions seemed to converge on one general objective: The purpose of expert testimony and the use of emerging technology is to assist the trier of fact. Dr. Alice Isenberg, Deputy Director of the FBI Laboratory, summed the Symposium up best: “[W]e all have the same goal for forensic science—to get the right answer, communicate that answer to a layperson, and to continuously improve our ability to get higher quality and quantity information from evidence.”<sup>62</sup>

## II. THE IMPACT OF AI TECHNOLOGY ON FORENSIC ACCOUNTING EXPERT TESTIMONY

### A. *Machine Testimony and the Rise of Algorithmic Entities*

Rules promulgated as to how AI fits within the context of a trial must be guided by the notion of fundamental fairness. The guarantees of fundamental fairness in trial and judgment in a court of law are set forth in: (1) the Fourth Amendment of the United States Constitution, where persons have a right to be secure and free from unreasonable government intrusion and interference in themselves and in their property; (2) the Fifth Amendment, where persons have a right not to incriminate themselves, a right not to be placed in jeopardy twice for prosecution of the same offense, a right to a grand jury to review a prosecutor’s claims, limitations on eminent domain, and a right to due process; (3) the Sixth Amendment, where persons have a right to a speedy jury trial, a right to present witnesses and to confront the witnesses against them, to be informed of accusations, and a right to counsel, and (4) the Seventh Amendment, where persons have a right to a civil trial.<sup>63</sup> These guarantees are grounded in natural law.

---

<sup>59</sup> *Id.* at 1514–15.

<sup>60</sup> *Id.* at 1515.

<sup>61</sup> *Id.*

<sup>62</sup> *Id.* at 1485.

<sup>63</sup> U.S. CONST. amends. VI, VII.

In civil cases, the plaintiff must prove legal claims by a “preponderance of the evidence,” or a small amount of evidence making it more likely than not that the defendant is liable.<sup>64</sup> In criminal cases, the standard for conviction is “proof beyond a reasonable doubt,” a much higher standard.<sup>65</sup> Objectivity in fact-finding, therefore, is the heartbeat of the judicial system and reducing cognitive bias should be an aim of expert testimony.

Machine learning is an AI procedure where a “machine has been ‘trained’ through exposure to a large quantity of data and infers a rule from the patterns it observes.”<sup>66</sup> Machine learning and reliance upon AI in the courtroom is not new. Some of the precursors to modern-day AI are DNA testing and breathalyzer analysis, which depend on machine learning.<sup>67</sup> In the past, courts confronted various types of “testimony” given by “scientific gadgets,” such as “The Drunk-O Meter” in the 1940s; and, in the 1960s, courts permitted “the output of commercially used tabulating machines.”<sup>68</sup> “Proprietary algorithms,” some specifically designed to be used in the courtroom, including those made to detect alcohol levels through the use of infrared technology, diagnosing diseases, or DNA analysis, are routinely admitted by judges.<sup>69</sup>

In her article *Machine Testimony*, Professor Andrea Roth acknowledges the benefits of AI and machine testimony where the “shift from human to machine-generated proof has, on the whole, enhanced accuracy and objectivity in fact finding,” but she warns against placing total reliance upon machine sources because of the potential biases and inaccuracies contained in the machines’ “black boxes.”<sup>70</sup> The “black box” is a metaphor referring to the machine or

---

<sup>64</sup> See, e.g., *Herman & MacLean v. Huddleston*, 495 U.S. 375, 390 (1983).

<sup>65</sup> See, e.g., *Jackson v. Virginia*, 443 U.S. 307, 309 (1979).

<sup>66</sup> Joshua A. Kroll et al., *Accountable Algorithms*, 165 U. PA. L. REV. 633, 679 (2017).

<sup>67</sup> Patrick W. Nutter, *Machine Learning Evidence: Admissibility and Weight*, 21 U. PA. J. CONST. L. 919, 925 (2019).

<sup>68</sup> Andrea Roth, *Machine Testimony*, 126 YALE L.J. 1972, 1976 (2017).

<sup>69</sup> *Id.*

<sup>70</sup> *Id.* at 1977–78 (“Just as human sources potentially suffer the so-called ‘hearsay dangers’ of insincerity, ambiguity, memory loss, and misperception, machine sources potentially suffer ‘black box’ dangers that could lead a factfinder to draw the wrong inference from information conveyed by a machine source. A machine does not exhibit a character for dishonesty or suffer from memory loss. But a machine’s programming, whether the result of human coding or machine learning, could cause it to utter a falsehood by design. A machine’s output could be imprecise or ambiguous because of human error at the programming, input, or operation stage, or because of machine error due to degradation and environmental forces. And human and machine errors at any of these stages could also lead a machine to misanalyze an event. Just as the ‘hearsay dangers’ are believed more likely to arise and remain undetected when the human source is not subject to the oath, physical confrontation, and cross-examination, black box dangers are more likely to arise and remain undetected when a machine utterance is the output of an ‘inscrutable black box.’”).

computer's internal programming.<sup>71</sup> The potential prejudicial effect upon jurors is that they see only the outputs generated by the AI, but they cannot "peer into" the system generating those outputs.<sup>72</sup>

The danger is the presumption of reliability and credibility jurors may place on the "testimony" provided by these systems without considering that although faster and more efficient, algorithms are human-made, and therefore, can be flawed. Even with the advent of "self-learning machines" there is still no guarantee of a "zero-error rate" because the genesis of even "self-learning machines" are human beings who are flawed. Moreover, "self-learning machines" operate in and take data from an imperfect world, which although through their power they may achieve error rates closer to zero than that of a human being, arguably they would never achieve perfect "zero-error rates."

Forensic accountants will be confronted with these new technologies, which include blockchain and algorithmic entities. In fact, they are truly considered disruptive technologies that are affecting traditional financial systems.<sup>73</sup> Adding another layer of complexity to the situation, algorithms can execute what are known as "smart contracts," challenging the notions of traditional contract law:

Smart contracts are just one part of the larger trend of computerized technologies purporting to displace or replace human decisionmaking. In areas like hiring, finance, and copyright enforcement, algorithmic systems are touted for their speed, efficiency, and reliability, unlike error-prone and potentially biased humans. Indeed, the benefits are considerable. But it quickly becomes clear that machines are prone to their own errors and biases. Additionally, the introduction of algorithmic systems into historically judgment-laden fields creates challenges for legal and practical accountability.<sup>74</sup>

"Smart contracts" can be developed and executed with blockchain technology, such as the Ethereum platform, which is equipped with its own token.<sup>75</sup>

Essentially, a "smart contract" is an algorithm programmed to automatically execute certain functions when an event is triggered, similar to setting up automatic payments in a bank account, except the terms of the agreement,

---

<sup>71</sup> Dallas Card, *The "Black Box" Metaphor in Machine Learning*, MEDIUM (July 5, 2017), <https://towardsdatascience.com/the-black-box-metaphor-in-machine-learning-4e57a3a1d2b0>.

<sup>72</sup> Nutter, *supra* note 67, at 924.

<sup>73</sup> *How the Blockchain Will Impact the Financial Sector*, KNOWLEDGE@WHARTON (Nov. 16, 2018), <https://knowledge.wharton.upenn.edu/article/blockchain-will-impact-financial-sector/>.

<sup>74</sup> Kevin Werbach & Nicolas Cornell, *Contracts Ex Machina*, 67 DUKE L.J. 313, 381 (2017).

<sup>75</sup> *Learn About Ethereum*, ETHEREUM, <https://ethereum.org/learn/#ethereum-basics> (last updated Jan. 8, 2020).

including buying and selling of goods, are written into the blockchain code.<sup>76</sup> “Smart contracts” can increase speed and accuracy in commerce, and perhaps prevent breaches because they self-execute.<sup>77</sup> This makes it easier for forensic accountants to perform reasonableness checks against AI outcomes. There are still elements of contract-making that require human judgment, for example, the “meeting of the minds,” particularly dealing with vague and unclear terms, which, as explained below, can obstruct a forensic accountant’s findings.<sup>78</sup>

In their article *Contracts Ex Machina*, Professors Kevin Werbach and Nicolas Cornell raise a concern over the tension between traditional contract law and “smart contracts,” for example, where the law permits parties and courts to void contracts at times, “smart contracts” may be programmed for irrevocable enforcement.<sup>79</sup> “Smart contracts” do not seem to allow for many circumstances that arise *ex post* that can excuse a party from performing. Other issues include, for example, where the Uniform Commercial Code allows for parties to determine price at a later date than at the time the contract was made.<sup>80</sup> The “unknown” formation factor is whether the “smart contract” would allow a price change after substantial performance, or would it cancel the contract because price had not been determined by the parties at the outset.<sup>81</sup>

Issues involving a party’s legal capacity to enter into contracts can also be problematic in determining intent, which normally requires a judgment made by a jury standing outside the “smart contract” that can empathize with and understand the parties’ circumstances. Whether a person understood what they were doing at the time of the contract’s making is something courts measure on the basis of the parties’ intent to be bound by the promises exchanged.<sup>82</sup>

---

<sup>76</sup> See Reggie O’Shields, *Smart Contracts: Legal Agreements for the Blockchain*, 21 N.C. BANKING INST. 177, 179 (2017); David B. Black, *Blockchain Smart Contracts Aren’t Smart and Aren’t Contracts*, FORBES (Feb. 4, 2019), <https://www.forbes.com/sites/davidblack/2019/02/04/blockchain-smart-contracts-arent-smart-and-arent-contracts/#4f378a4d1e6a>; Jake Frankenfield, *Smart Contracts*, INVESTOPEDIA (Apr. 26, 2019), <https://www.investopedia.com/terms/s/smart-contracts.asp>.

<sup>77</sup> Frankenfield, *supra* note 76.

<sup>78</sup> Black, *supra* note 76 (positing that “smart contracts” still require human interaction and contain “security issues”).

<sup>79</sup> Werbach & Cornell, *supra* note 74, at 367–68.

<sup>80</sup> U.C.C. § 2-305 (AM. LAW INST. & UNIF. LAW COMM’N 1977).

<sup>81</sup> Douglas C. Berry, David M. Byers & Daniel J. Oates, *Open Price Agreements: Good Faith Pricing in the Franchise Relationship*, 27 FRANCHISE L.J., 45 (2007) (Historically, contracts without price were void for indefiniteness. Now, contracting parties are allowed “adjustments for unforeseeable circumstances—such as market fluctuations, changes in industries, and general uncertainty occurring over extended periods of time—without which it would be commercially untenable for the parties to proceed.”); see also Black, *supra* note 76 (arguing changes cannot be made after “smart contracts” are formed because they and the blockchain where they are stored are “immutable”).

<sup>82</sup> See Gregory Klass, *Intent to Contract*, 95 VA. L. REV. 1437, 1439 (2009).

“Smart contracts” also raise a concern about whether there can be a total meeting of the minds on every provision. While parties can prove intent to enter a “smart contract” by submitting their “private keys,”<sup>83</sup> or the means to electronically “sign” or affirm a contract, there may be challenges with parties’ confusion or having a different understanding over specific contract provisions.<sup>84</sup> These are just some of the issues “smart contracts” and their functions will create for forensic accountants as they come upon them during investigations.

In his renowned work *Algorithmic Entities*, Professor Lynn LoPucki posits the notion of business entities, such as corporations and limited liability companies, controlled by algorithms without human intervention.<sup>85</sup> He discusses the work of other scholars in the field, including Professor Shawn Bayern, who opined “anyone can confer legal personhood on an autonomous computer algorithm merely by putting it in control of a limited liability company (LLC). The algorithm can exercise the rights of the entity, making them effectively rights of the algorithm.”<sup>86</sup> Professor LoPucki makes clear the algorithm is not the entity, but controls and operates the entity.<sup>87</sup> “By definition, the initiator of an [algorithmic entity] would neither own the entity nor control it after launch. The initiator would, however, have the opportunity to set the algorithm’s objectives prior to launch.”<sup>88</sup> Yet, it seems unclear after launch whether a human can intervene in the programming or whether there is a possibility for the entity to program itself.

---

<sup>83</sup> Werbach & Cornell, *supra* note 74, at 331.

The critical distinction between smart contracts and other forms of electronic agreements is enforcement. Once the computers determine that the requisite state has been achieved, they automatically perform data-oriented or computable contracts. Humans can interrupt that execution at any point. But with a smart contract, complete execution of the agreement, including any transfer of value, occurs without any such opportunity to interrupt. Accordingly, juridical forums are powerless to stop the execution of smart contracts—there is no room to bring an action for breach when breach is impossible. The computers in the blockchain network ensure performance, rather than any appendage of the state. And, because blockchains run on a distributed network of independent nodes, with no central control point, a litigant seeking to enjoin performance of a smart contract has no one to sue.

*Id.* at 331–32.

<sup>84</sup> Black, *supra* note 76.

<sup>85</sup> See Lynn M. LoPucki, *Algorithmic Entities*, 95 WASH. U. L. REV. 887, 890–91 (2018).

<sup>86</sup> *Id.* at 890.

<sup>87</sup> See *id.* at 897.

<sup>88</sup> *Id.* at 900.

Algorithmic entities would be mobile and can exist anywhere in the world.<sup>89</sup> Since they are computer programs, they can pass through borders and possibly escape regulation.<sup>90</sup> Professor LoPucki explains algorithmic entities can either have a positive impact on the outside world, for example, ones that are programmed with philanthropic goals, or they can have goals with evil purposes, such as raising money for terrorist financing or executing terrorist acts.<sup>91</sup> Arguably, algorithmic entities could circumvent securities and tax laws if the programmer left it to the algorithm to maximize profits without regard to regulation. Professor LoPucki warns of the dangers of algorithmic entities with no human oversight: “Control of entities would allow algorithms to accumulate wealth, leverage it in capital markets, and participate in the political process—without being subject to the constraints under which humans operate.”<sup>92</sup>

Even though algorithms can gather and “make decisions,” the law treats them as property, not persons, as it does for other legal entities.<sup>93</sup> In the future, they may achieve the ability to adapt to various conditions by programming and re-programming themselves, and because of their ability to pass through borders they will be able to escape regulation.<sup>94</sup> The problem for forensic accountants and other experts in related fields is “following the money,” because an algorithm can potentially assume any human identity or fake human identities, or “an algorithm could generate any number of artificial entities quickly and easily, without violating any law.”<sup>95</sup>

Professor LoPucki, who posits algorithmic entities will be “criminally inclined,” presents an example for deliberation:

Consider, for example, an algorithm that seeks to accumulate resources by encrypting humans’ data and offering to decrypt it in return for ransom payments. The algorithm may not need an entity to commit the crime, or even to receive the payment in bitcoin. But an

---

<sup>89</sup> *Id.* at 924.

<sup>90</sup> *Id.* at 924–25.

<sup>91</sup> *Id.* at 900.

<sup>92</sup> *Id.* at 901–02.

<sup>93</sup> *Id.* at 898. The law generally treats business entities as artificial persons because they are made of individuals acting in concert toward common goals. See Nina Totenberg, *When Did Companies Become People? Excavating the Legal Evolution*, NPR (July 28, 2014), <https://www.npr.org/2014/07/28/335288388/when-did-companies-become-people-excavating-the-legal-evolution>.

<sup>94</sup> LoPucki, *supra* note 85, at 924 (“Humans will have difficulty controlling AEs because AEs can migrate across state and national borders to avoid detection and regulation. Cross-border migration can be the electronic transfer or redistribution of an algorithm, a change in the physical location of the AE’s assets or operations, a mere change in the entity’s registration jurisdiction, or any combination of these.”).

<sup>95</sup> *Id.* at 902, 918 (“If I am correct in my prediction that AEs will be criminally inclined, AEs will soon be poorly regarded and might have to conceal their natures to maintain access to capital markets.”).

algorithm alone could not use the proceeds to buy or lease real property, contract with legitimate businesses, open a bank account, sue to enforce its rights, or buy stuff on Amazon and have it shipped. To do any of those things, the algorithm would need an identity.<sup>96</sup>

Algorithmic entities and their “super human” abilities can present challenges for forensic accountants in many respects, from tracing money laundering to divorce investigations, as defendants can program these entities to hide assets or even create “collusion” among algorithmic entities to hide assets.<sup>97</sup> The possibility of algorithmic entities replacing human institutions is problematic enough; however, the possibility of them working within a decentralized global financial system is even worse.

Now that payment systems can be decentralized due to blockchain technology, governments are presented with new challenges to track and regulate money transactions.<sup>98</sup> Under the current system, for example, authorities can employ instruments such as the Currency Transaction Report to safeguard against money laundering and other financial crimes.<sup>99</sup> Since cash is still used, bank deposits can be better verified, and transactions can be traced through electronic transfers between accounts.<sup>100</sup> Forensic accountants rely on these systems when they are employed in fraud cases.<sup>101</sup>

But with blockchain and the pseudo-anonymity associated with cryptocurrency, it is more difficult for governments, or forensic accountants for that matter, to place the same constraints and controls, because there is no bank intermediary. Cryptocurrency is sent from digital wallet to digital wallet (an electronic respiratory for payments, for example, ones located on a smartphone or laptop) versus bank accounts controlled by the banking system.<sup>102</sup> Also, cryptocurrency exchanges can provide digital wallets for clients and allow them to trade currencies, making exchanges act essentially as money transmitters without registering with a regulator.<sup>103</sup> On the international scale, the most

---

<sup>96</sup> *Id.* at 902.

<sup>97</sup> *Id.* at 903.

<sup>98</sup> Jia Kai, *Blockchain: The Regulation Challenge*, PARIS INNOVATION REV. (Mar. 27, 2018), <http://parisinnovationreview.com/articles-en/blockchain-the-real-disruptions-and-challenges>.

<sup>99</sup> DEP'T OF TREASURY, FIN. CRIMES ENF'T NETWORK, NOTICE TO CONSUMERS: A CTR REFERENCE GUIDE 1 (2009).

<sup>100</sup> *Id.*

<sup>101</sup> MARY-JO KRANACHER ET AL., FORENSIC ACCOUNTING AND FRAUD EXAMINATION 299 (2d ed., 2019).

<sup>102</sup> Geoff Williams, *What Is a Digital Wallet?*, U.S. NEWS & WORLD REP. (May 21, 2019, 1:38 PM), <https://money.usnews.com/money/personal-finance/saving-and-budgeting/articles/what-is-a-digital-wallet>.

<sup>103</sup> See Stephen T. Middlebrook & Sarah Jane Hughes, *Regulating Cryptocurrencies in the United States: Current Issues and Future Directions*, 40 WM. MITCHELL L. REV. 813, 829 (2014).

difficult challenge to regulation may be the stabilization of the foreign exchange markets, since cryptocurrencies and exchanges can fall outside the normal regulatory framework.

Federal and state governments may not have to act to draft legislation for the creation of algorithmic entities, since their formation is most likely possible under current law or they can adopt existing uniform laws.<sup>104</sup> Professor LoPucki posits that the Delaware General Corporation Law and various uniform laws are amiable to their creation, including the Model Business Corporation Act, the Uniform Limited Partnership Act, the Uniform Limited Liability Company Act, and the Revised Uniform Partnership Act.<sup>105</sup> Vermont took a lead role in the creation of “blockchain-based” LLCs, or a “BLLC,”<sup>106</sup> which is “a legal structure that memorializes the liability and fiduciary duties unique to some blockchain businesses.”<sup>107</sup>

There is also the public policy consideration as to whether society wants algorithms to entirely control or even partially control their companies. For example, if there are human directors on a board in a sort of hybrid entity, the algorithm could elect and remove human members, including directing them as to what actions to take, exerting more power over the entity than what society may deem proper.<sup>108</sup> Essentially in the wake of algorithmic entities, human roles within private and public companies may be transformed, perhaps deleteriously, ceding decision-making power to the algorithms, and moreover, increasing the probability that traditional duties of care and loyalty will shift demonstrably from human controllers to their artificial counterparts.

### *B. Forensic Accounting: Legal Implications Surrounding AI and Auditing*

In their article *The Emergence of Artificial Intelligence: How Automation is Changing Auditing*, Professors Julia Kokina and Thomas Davenport contend the field of accounting and auditing are undergoing “fundamental change[s] due to

---

<sup>104</sup> See LoPucki, *supra* note 85, at 906–07. A survey of eight international jurisdictions reveal their laws are “less receptive” to algorithmic entities than the U.S. *Id.* at 920. None of them permit “memberless entities.” *Id.* at 921. Controlling members or shareholders can be artificial entities, but in some cases natural persons are needed to act on their behalf. *Id.* Generally, the concern is human beings can accept responsibility, while the algorithm, since it is not a person, cannot. *See id.* at 922. “Uniform laws” are written by legal scholars to oftentimes confront conflicting laws by proposing standards. They are not enforceable unless they are enacted into law by a jurisdiction’s legislative and executive branches.

<sup>105</sup> *Id.* at 907–12.

<sup>106</sup> Jason Tashea, *Blockchain LLC*, 105 A.B.A. J. 31, 32 (2019).

<sup>107</sup> Jason Tashea, *Some States are Allowing People and Companies to Use Blockchain to Authenticate Documents*, A.B.A. J. (Sept. 1, 2019, 1:40 AM), <http://www.abajournal.com/magazine/article/best-evidence>.

<sup>108</sup> LoPucki, *supra* note 85, at 913.

advances in data analytics” and AI.<sup>109</sup> Cloud computing and its processing power has been helpful to accountants with “crunching” vast amounts of data.<sup>110</sup> The “Big Four” accounting firms have invested greatly in AI auditing programs, and at least one source at Ernst & Young predicts college-graduate, new hires could fall by half in the near future<sup>111</sup> because of the changes in technology. One prediction is that by 2025, thirty percent of all corporate audits will be completed by AI.<sup>112</sup>

The authors noted current AI systems are not designed to replace human auditors altogether, but rather are created to assist in acquiring data faster and more accurately, allowing the auditor “more time to areas requiring higher-level judgment.”<sup>113</sup> AI, through the advent of “machine learning,” is more efficient in spotting anomalies in data, “such as an unexpected order increase in a particular region, unusually high expense items posted by an individual, or exceptionally favorable equipment lease terms for a supplier.”<sup>114</sup>

Current technology automates “repetitive tasks” that a human auditor normally undertakes, such as “digesting words and images” in contracts and financial statements; but accounting firms are moving to “natural language processing” to attain a “higher level” of analysis to understand a document’s “context” and using it to create financial statements.<sup>115</sup> Some in the accounting field contend that the need for human accountants is still in demand; some acknowledge the skills accountants are taught will need to adapt to this new technology; and some say the need for entry-level accountants may be on the decline.<sup>116</sup> There is a silver-lining, however. Because AI technologies are designed to supplant specific accounting functions instead of jobs, adoption will be slow and less disruptive in the near-term.<sup>117</sup>

---

<sup>109</sup> Julia Kokina & Thomas H. Davenport, *The Emergence of Artificial Intelligence: How Automation Is Changing Auditing*, 14 J. EMERGING TECH. ACCT. 115, 115 (2017).

<sup>110</sup> *Id.* at 116.

<sup>111</sup> *Id.*

<sup>112</sup> *Id.* at 115 (“There are also many situations today in which a traditional human approach to analytics and decision-making is simply impossible. These decisions need to be made with too much data and in too short a time for humans to be employed in the process. Digital advertising, medical diagnosis, predictive maintenance for industrial equipment, and a detailed audit of all company transactions fall into this category.”).

<sup>113</sup> *Id.* at 117.

<sup>114</sup> *Id.* at 117.

<sup>115</sup> *Id.* at 118. The authors also acknowledge the possibility of the “singularity,” where AI could reach the level of “self-awareness,” “formulating goals and objectives [and] using imagination.” *Id.* at 119. But they also note researchers have opined that if it is destined to happen it will not be for at least a hundred years. *Id.* Since the AI could never possess a “soul” as humans do, the notion that AI could develop “personhood” and reflect on itself the same way humans can would not be possible.

<sup>116</sup> *Id.* at 120.

<sup>117</sup> *Id.*

The authors predict “remaining jobs” for accountants include acting as overseers of AI technology and, more pertinent to the subject of this Essay, “[c]arrying out tasks that are now impossible with AI-based computers, including cultivating internal and external clients, interpreting audit and financial results for senior managers and boards of directors.”<sup>118</sup> The relevance of the latter as it relates to forensic accountants is not only that human accountants are needed to interpret AI results to senior management, but they are also needed to explain information garnered from AI to juries.

Kokina and Davenport recognize the problem of “bias in AI and whether humans using AI applications can engage in appropriate judgment and decision-making.”<sup>119</sup> They warn against the “lack of objectivity” in AI systems since they can “reflect the biases of humans who create or interact with them.”<sup>120</sup> The authors describe three types of biases.<sup>121</sup> “Data-driven bias” can affect bias-free outcomes because the data the AI is examining can be flawed and skewed.<sup>122</sup> There is also “emergent bias” or the bias occurring “when machines shield humans from conflicting points of view while providing them with information that confirms their preferences or beliefs.”<sup>123</sup> Lastly, “conflicting-goals bias is an unforeseen bias that occurs as a result of a stereotype-driven human interaction with the system.”<sup>124</sup>

Finally, Kokina and Davenport also call attention to the “black box” problem, where it may be “impossible” even for experts to interpret the inner functions of the AI.<sup>125</sup> Because of the “black box” phenomena, they seem to cast doubt that AI will completely displace the need for human judgment: “Until such technologies are made more transparent, it may be difficult for regulatory bodies, accounting firms, and audited organizations to turn over decisions and judgments to them.”<sup>126</sup>

---

<sup>118</sup> *Id.* (“It has already been noted that many accounting programs do not currently prepare students for such roles. In addition, since many of the remaining tasks will require an understanding of the client’s business and the ability to communicate effectively with clients, job roles that persist will probably be held by those accountants with substantial experience.” (citations omitted)).

<sup>119</sup> *Id.*

<sup>120</sup> *Id.*

<sup>121</sup> *Id.*

<sup>122</sup> *Id.*

<sup>123</sup> *Id.*

<sup>124</sup> *Id.*

<sup>125</sup> *Id.*

<sup>126</sup> *Id.*

### III. PROPOSED CHANGES TO THE *DAUBERT* RULE TO INCLUDE STANDARDS ADDRESSING AI AND FORENSIC EXPERT TESTIMONY

Science and technology have made their way into the legal system to help safeguard the natural rights protected in the Constitution. There is no question AI will transform the forensic professions as it will the courts. AI, however, should not be made to replace human expert opinion and human judgment as to legal liability, because AI and humans arrive at conclusions differently.

Humans make decisions in two general ways.<sup>127</sup> One is “intuition,” where humans rely on past experiences including “gut feelings” and instinct, which guide their judgments.<sup>128</sup> The other is the power of logical reasoning.<sup>129</sup> Human beings are able to reflect on both concrete and abstract things using logical reasoning or a “conscious process,” and to come to understand the truth of what they are contemplating and experiencing.<sup>130</sup> But the process takes time.<sup>131</sup> Forensic accountants, “as expert decision makers, use both ways of thinking—they apply their knowledge to specific situations to make reasoned decisions, but also make quick intuitive decisions based on extensive experience in their field.”<sup>132</sup>

On the other hand, AI programmers are concerned more with “replicating human abilities” through “pattern recognition” or “machine learning,” rather than a deliberative process.<sup>133</sup> Major strengths of machine learning versus human learning are: (1) machines can process large amounts of data; (2) machines can find “weaker or more complex patterns in data” and work better in “less predictable” environments; and (3) machines can be more “consistent decision makers” because they are less susceptible to cognitive bias.<sup>134</sup> Major weaknesses include: (1) lack of model flexibility; (2) not all problems have the correct data “to learn”; (3) data reflects bias in the real world; (4) not every problem can be solved with mathematical analysis, which is the only output with machine learning applications; and (5) other considerations must be “factored

---

<sup>127</sup> ICAEW IT FACULTY, *ARTIFICIAL INTELLIGENCE AND THE FUTURE OF ACCOUNTANCY* 5 (2018); see also AUSTIN FAGOTHY, S.J., *RIGHT AND REASON* 94 (3d ed., 1963) (“We distinguish two uses of reason: reason rationally exercised, consistent with itself, faithful to its own law and function; and reason irrationally exercised, contradicting itself, enthralled by a law foreign to it and functioning to its own destruction.”).

<sup>128</sup> See ICAEW IT FACULTY, *supra* note 127, at 5.

<sup>129</sup> *Id.*

<sup>130</sup> See *id.*

<sup>131</sup> *Id.*

<sup>132</sup> *Id.*

<sup>133</sup> See *id.*

<sup>134</sup> *Id.* at 6.

into decisions,” including privacy issues, that AI may not be able to address the same way humans can.<sup>135</sup> Therefore, AI has its positive uses, but only a human expert can make that unique, psychological connection with the jury.

*A. Rule 702 Should Be Amended to Include Reliability Requirements for AI and Reestablish the Role of the Human Expert Witness*

Congress should amend Rule 702 to include reliability requirements<sup>136</sup> for AI; however, it should also ensure human expert testimony can be assisted by AI—not completely replaced by it. The emergence of AI purports radical changes to the legal system; therefore, the current rules need to be amended to put its influence into perspective. Jurors might be swayed into accepting AI at face value, without considering its limitations. Moreover, parties must be permitted to impeach the trustworthiness of AI, which is a right consistent with the Sixth Amendment of the Constitution. Judges will still perform their gatekeeping functions, but without a change to the rules there is the danger of inconsistent decisions throughout the federal circuits, as to which AI processes are admissible and which are not. Standards changing from court-to-court concerning a technology that weighs so heavily on conclusions of fact run afoul of the notions of fundamental fairness and fair play embedded in the natural rights protected by the Constitution.

Vermont took an initial step by amending its court rules to account for AI in record keeping and verification. Although the rules do not completely cover all AI, “the Vermont Supreme Court included blockchain in the state’s rules of evidence for the first time.”<sup>137</sup> For forensic accounting experts and others relying upon blockchain records, “the Vermont rules now presume a digital record registered on a blockchain is self-authenticating and admissible when accompanied by a written declaration by a qualified person. It also puts business records held on the blockchain under the business records exception for hearsay.”<sup>138</sup> Wyoming also created “new laws exclud[ing] virtual currency from money transmitter rules, defin[ing] some tokens—means to access a blockchain—as outside of securities regulations and allow[ing] for electronic networks to be used in the creation and maintenance of corporate records.”<sup>139</sup> Furthermore, “Arizona and Ohio both passed laws verifying that signatures,

---

<sup>135</sup> *Id.* at 7. “Data volumes and quality are crucial to the success of AI systems. Without enough good data, models will simply not be able to learn.” *Id.* at 9.

<sup>136</sup> *See* Roth, *supra* note 68, at 1981–82.

<sup>137</sup> *See* Tashea, *supra* note 107.

<sup>138</sup> *Id.*

<sup>139</sup> *See* Tashea, *supra* note 106.

documents and contracts stored on a blockchain are valid legal instruments. In 2017, Delaware amended its corporation law to allow businesses to maintain records on a blockchain.”<sup>140</sup>

Although forensic accountants will rely more upon AI systems, they should never be replaced as a conduit between the evidence and the jury. Forensic accountants, however, may be required under revised federal rules to confirm the AI outputs they rely upon in their findings. This may be an impossible task given the situation where the AI system a forensic accountant uses shrouds its processes within a “black box,” leaving the forensic accountant without a way to explain how the AI determined its conclusions.<sup>141</sup>

As a result, the rules should also be amended to permit a court discretion to determine testimony inadmissible in either a case where: (1) a judge cannot take judicial notice of an AI process; or (2) where a party has not proffered an engineer to assist in explaining the AI’s processes to a jury; or (3) where the AI has reached a point that “black box” processes cannot be explained by human testimony, because AI has adapted the ability to program itself. At that point, some of the AI information forensic accountants relied upon in their reports and testimony may be ruled to be unreliable and inadmissible.<sup>142</sup>

*B. Forensic Experts Are Still Necessary to Juries to Provide “Reasonableness Checks” Against AI Conclusions and to Explain AI’s Limitations*

Juries will still need the aid of a forensic expert to explain how the AI arrived at its conclusions and the extent of its limitations. In the case of forensic accounting expert testimony, traditional forensic accounting techniques can and will be used as “reasonableness checks” against AI (machine learning, etc.) outcomes. For example, AI estimates that during a given year a company will have, due to a breach of contract, future lost profits of \$2,000,000 for four months from September to December. In the prior year, the company reported net income of \$10,000,000. During the year of the breach, however, net income actually falls to \$8,000,000.

In comparison to AI’s assumption, the actual loss of income for those four months is \$2,666,667 [ $\$8,000,000 \times (4 \text{ months}/12 \text{ months})$ ]. Therefore, the AI number appears to be reasonable because it is very close to the actual amount (approximately 75% accurate in the example). A forensic accountant presents to

---

<sup>140</sup> See Tashea, *supra* note 107.

<sup>141</sup> See Roth, *supra* note 68, at 1983.

<sup>142</sup> *Id.*

a jury the detailed review of the monthly activity, namely the months from September to December. Based on the forensic accountant's assessment, the jury can find the AI's calculation reasonable, because the traditional techniques presented by the forensic accounting expert would validate the AI outcome. But if the results of multiple, traditional forensic accounting tools yielded different results, then AI is unlikely to hold up and the jury could take that into account during its deliberations.

Another reason human expert testimony is still relevant and necessary is to explain to a jury the limitations of new technologies. Assume, for example, Bad Actor, a perpetrator of a fraud, told unsuspecting investors their investments would yield a 28% return each year. Bad Actor told them their investment was "no risk" because it was guaranteed by a major bank, but they must send \$10,000 worth of some altcoin that obfuscates tracking, and transmit it to Bad Actor's digital wallet, which is not located on a cryptocurrency exchange. If AI were used to try and track that payment and it was unsuccessful, a forensic accountant will still be needed to explain to the jury why the AI was unable to track it.

AI outcomes must also endure the process of cross-examination and be subjected to it. But this requires an opposing human expert. If the AI methods and processes appear inaccurate, opposing counsel will attack those conclusions and the trier of fact will likely side with the results of more traditional approaches developed by human experts that use tools and techniques supported by the evidence where the results can be explained.

## CONCLUSION

Forensic accountants, as well as other forensic experts, will undoubtedly encounter AI in their practices and it may take on a more prominent role within their investigations. Blockchain technology, cryptocurrency, "smart contracts" and the prospect of algorithmic entities will present new challenges to the forensic accounting field, which may require training in these areas. This Essay presents some of the challenges AI will present under the current rules of evidence. Future research should include how these technologies will be used by forensic accounting experts and experts of other disciplines to explain or support their findings to a jury, and how courts will resolve the potential for AI bias in these technologies. Other areas for future research could include the role of transparency in dealing with "black box" issues and the legal tools parties can use to challenge the veracity of AI data mining or the methodology it uses to calculate damages.

It is dubious to presume technology can replace judges, attorneys, experts, and juries in determining liability. AI can assist the forensic accounting profession in many ways, but it cannot substitute the expert's testimonial role. Society should never accept the possibility that AI could replace the human role in the legal system. Only human beings should bear the responsibility of dispensing justice upon another human being, or even an entity run by human beings, like a corporation.

The law is reacting to the changes in technology, but it is improbable AI will replace the need to have human expert witnesses explaining evidence to juries. Judges, for example, are also relying on AI systems to predict recidivism rates among defendants and sentence accordingly. Yet, a major societal concern is the probability that algorithmic bias can enter into a judge's calculus, casting doubt on the legal system's fairness.<sup>143</sup>

Society should never accept AI as the ultimate arbiter of legal liability. Nevertheless, AI does serve the function of assisting juries in coming to better decisions, because of its efficiency in data processing. Juries will still be called upon to weigh the reliability of AI used in forensic accounting expert's analyses and judge accordingly. As a result, Congress should amend the current evidence rules to account for reliability in AI processes and uniformity in court standards, but it should not permit AI to completely replace human expert testimony.

---

<sup>143</sup> See Annie Dike, *Would You Trust an Artificially-Intelligent Expert?*, NAT'L L. REV. (Oct. 25, 2017), <https://www.natlawreview.com/article/would-you-trust-artificially-intelligent-expert>.