



# **A Review Of The Issues And Challenges In Relation To The Criminal Liability Of Artificial Intelligence Entities**

**\*U.C Kalu & O.U Oduma \*\***

## **ABSTRACT**

This paper discussed the basic issues and challenges of criminal liability of artificial intelligence entities. These issues and challenges which are in form of computer programs or software are akin to the problems of the enforcement of cybercrimes. Most of the crimes committed by artificial intelligence software or entities are known as internet crimes/offences and their enforcement poses some problems and challenges. Also, determining the personhood of artificial intelligence entities, their possible right to dignity and power to own or acquire property and so on are also some of the issues which contribute to the challenge inherent in determining their possible liability for crimes and way of enforcing the relevant laws on them if at all they are found guilty. Thus, the recent technological advancement has undoubtedly reshaped the world as some of the tasks earlier on reserved or being solely performed by humans are now carried out with ease by non-human entities generally referred to as artificial intelligence entities with some attendant negative impact. This development made some scholars and legal minds to agitate for the criminal liability of such entities so that they can be treated as humans when things go wrong with their use or when they act illegally. Unfortunately the criminal liability of such artificial intelligence entities may be bedeviled by some issues and challenges aforesaid which may be capable of making it impossible or difficult to arrest and prosecute them. The aim of this paper was to examine the basic issues and challenges militating against the criminal liability of AI entities. The methodology adopted is doctrinal via analyzing the relevant laws, judicial decisions and opinions/suggestions of some erudite scholars. It is found that there are discordant views of authors on this subject and that these issues and challenges have hitherto affected the criminal liability of AI entities. It is recommended that in order to circumvent these threatening issues and challenges in respect of AI liability for crimes/offences, their personhood should be made definite so that they could be held directly liable for their crimes/offences. They should also be classified for the purposes of criminal liability and where they could not be held liable, their developers, users, controllers or instructors should be held liable just like corporations by invoking the principle of 'lifting the veil'.

**Keywords:** Artificial intelligence, challenges, entities, issues,

## **1. INTRODUCTION**

Artificial intelligence today is of global concern and issues related to intelligence entities have taken a cosmopolitan outlook. Thus, these artificial intelligence entities which include robots and computer software/program are replacing more and more human activities<sup>1</sup>, These AI entities are used in various industrial fields such as legal, medical, military and game companies<sup>2</sup>. This development of Artificial Intelligence does not only give pure function to human life, but also the dysfunction that arises from malfunction of the said technology. In some modern countries, unmanned vehicles, sophisticated surgical systems, industrial computing systems, trading algorithms and other artificial intelligence entities are

\*U.C. Kalu, LL.M, PhD, Professor of Law, Nnamdi Azikiwe University, Awka, 08037727063,

\*\*O. U. Oduma, LL.B (Hons), BL, LL.M, Doctoral Candidate Nnamdi Azikiwe University, Awka, Nigeria, odumaoliver68@gmail.com. +23448038396730

<sup>1</sup> I Boucq Robots for business available at <http://www.Atellerus.com/emergingtechnologies/article/robots-for-business> accessed 18 September, 2023

<sup>2</sup> W B Schwaberts, S Ramesn and P Szowats, 'Artificial Intelligence Medicine: Where do we Stand?' (1987) 21 *Jurimetrics Journal* 362, Richard E. Susskind, 'Artificial Intelligence, Expert Systems and the Law' (1990) 5 *Denning Law Journal*, 105.

commonly used for both industrial and personal purposes. Issues of concern will be brought into limelight when something goes wrong such as when the unmanned vehicle is involved in an accident, the surgical system is involved in a surgical error or the trading algorithm is involved in fraud and so on. The liability of such AI entities in that circumstance is bedeviled by some issues and challenges which is the crux of this research work.

Pertinently, the offences related to artificial intelligence entities are difficult to prosecute because of some inherent issues and challenges. When an offence is alleged to have been committed by AI entity, the question whether such entity is a person in law readily comes to the mind. Another issue is whether such entity has ownership rights or whether the offence can be attributed to it. Human dignity and ethics in algorithm/machine learning are other issues of concern to be examined in relation with such AI entities vis-à-vis human beings. Accountability mechanism and intellectual property issues/right also form part of the issues to be addressed. When the hurdles of the inherent issues are surmounted, challenges such difficulty in detecting the *means rea* of such AI entities, challenges of jurisdiction, data encryption and so on will be determined towards ascertaining whether or not such AI entities will be liable for such crimes.

## **2. ISSUES RELATED TO CRIMINAL LIABILITY OF ARTIFICIAL INTELLIGENCE ENTITIES**

In this part of this article, issues related to the criminal liability of AI entities will be examined. These issues include personhood of AI entities, attribution/ownership rights, question of human dignity, ethics in algorithms/machine learning, accountable mechanism and intellectual property issues/rights. These issues are discussed below in line with the views, opinions and suggestions of some erudite authors and scholars.

### **2.1 Personhood of Artificial Intelligence Entities**

A logical extension of the question of whether artificial intelligence possesses intrinsic morality is whether this can be the basis for more concretized rights such as complete personhood. Marshal Willick<sup>3</sup> notes that the reluctance to grant artificial intelligence personhood comes from treating computers as the other, which hinders their evaluation on the same terms as humans. In his opinion, as computers increasingly begin to behave like humans, it will become more and more reasonable for law to treat them as persons into themselves. Attributing property rather than personhood characteristics, in his opinion, weakens moral foundations of society.<sup>4</sup>

David Levy,<sup>5</sup> in comparing robots to children, supports the view that conscious robots ought to have rights. He noted that until an entity is accorded rights, we continue to think of it as being for our own use. Chopra and White<sup>6</sup> note that personhood will be granted to artificial intelligence only if:

- (i) There exists internal doctrinal pressure or
- (ii) In the cost benefit analysis, legal convenience is in favour of granting such personhood.

Such legal convenience is furthered by the potential practical benefits to granting personhood, as the European Parliament<sup>7</sup> discussed as a part of its proposal for the establishment of a Charter on Robotics. The recognition of legal personality also brings with it the potential attribution of legal liability. In other words, a robot is only worth suing for compensation if it is covered by insurance; the Parliament recommends obligatory insurance for intelligent robots. Personhood is also beneficial as regards contract law – if robots can act for themselves under contract, they will also be able to be personally held liable. Also, granting personhood could enable robots to pay taxes on any earnings which could secure social welfare systems.

<sup>3</sup> M. S. Willick, Artificial Intelligence: Some Legal Approaches and Implications, Artificial Intelligence Magazine, (1983) 4(2), 5.

<sup>4</sup> *Ibid*, p. 14

<sup>5</sup> D Levy, 'The Ethical Treatment of Artificially Conscious Robots', (2009) 1(3) International Journal of Social Robotics 209-216.

<sup>6</sup> S Chopra and L White, Artificial-agents Personhood in Law and Philosophy, in Proceedings of the 16<sup>th</sup> European Conference on Artificial Intelligence, August, 2004 pp. 635-639, IOS press.

<sup>7</sup> Do Robots have Rights? The European Parliament Addresses Artificial Intelligence and Robotics (n.d) available at [www.cms-lawnow.com/ealertss/2017/04](http://www.cms-lawnow.com/ealertss/2017/04) accessed 12 November 2022.

Other authors propose the grant of personhood status on the fulfillment of certain pre-conditions. Lawrence Solum<sup>8</sup> is in favour of granting artificial intelligence personhood if it behaves the right way and if it is confirmed that the processes that produce such behaviour are similar to those of humans. He even calls for a redefinition of personhood, stating that our existing notions of it are inadequate. Chopra and White<sup>9</sup> believe that legal personality is an important stepping stone towards being accorded constitutional rights. The factors to be weighed when the legal system debates personhood include:

- (i) Practical capacity to perform cognitive tasks; and
- (ii) The ability to control money: being able to receive, hold and pay money and other property such as securities and to remain financially solvent.

Patrick Hubbard<sup>10</sup> analyzed the liberal theory of personhood and argued for a legal right to personhood if an intelligent artefact

- (i) Has the ability to interact with its environment;
- (ii) Can engage in complex thought and communication;
- (iii) Is capable of possessing a sense of self; and
- (iv) Can live in a community based on mutual self-interest.

The corollary of the foregoing is that there is the partial personhood theory. Chopra and White<sup>11</sup> put forth the argument that artificial intelligence may be conferred personhood for some legal purposes and not for others. The rights as regard to each type of personhood would then accrue to the artificial intelligence. Rejecting the notion that a pre-condition for personhood is the need to be human, they divide legal personality into two-dependent and independent. Granting dependent legal personality to artificial intelligence (like that currently granted to children) would be far easier than independent legal personality, which would require the artificial intelligence to reach a much higher level of technological sophistication. Marshal S. Willick<sup>12</sup> is in agreement with this pre-position, and believes that legal rights for artificial intelligence can borrow from the current regime of partial personality of corporations.

It is a view held in this article just like some other authors that if artificial intelligence entities become so conscious and act autonomously an independent of their programmers/developers or develops beyond the purpose and essence upon which they were developed/programmed, such artificial intelligence entities should be granted normal right to personhood just as natural persons. In such cases, they will be made to face the consequences of their actions or omissions.

## **2.2 Attribution/Ownership of Rights**

The United Kingdom (UK) is the only nation whose copyright legislation<sup>13</sup> deals directly with computer-generated work. Section 9(3) of the Copyright, Designs and Patents Act states: 'In the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken' Section 178 of the Act defines a computer-generated work as one that 'is generated by computer in circumstances such that there is no human author of the work', making the law quite clear in this regard.

However, Andreas Guadamuz<sup>14</sup> notes that despite a seemingly clear wording of the law, there is ambiguity as to the actual author. Drawing an analogy to Microsoft Word (programmed by Microsoft, but the company does not have copyright over the works it creates using it), Guadamuz states that there could potentially be authorship attribution to either the programmer or the user, and under the law, it is unclear which. He analyzed the laws of jurisdictions such as the EU, the US and Australia, concluding that there are wide gaps in the interpretation of originality for copyright protection, more so in the case of computer-generated works. He details two areas in which failing to provide copyright protection would lead to

<sup>8</sup> L B Solum, Legal Personhood for Artificial Intelligence, NCL Review (1991) 70, 1231.

<sup>9</sup> *Ibid*, p. 118

<sup>10</sup> F P Hubbard, Do Androids Dream: Personhood and Intelligent Artifacts, Temp. L. Rev. (2010) 83, 405.

<sup>11</sup> S Chopra and L F White, *A Legal Theory for Autonomous Artificial Agents*, (University of Michigan Press, 2011).

<sup>12</sup> M S Willick, 'Constitutional Law and Artificial Intelligence. The potential Legal Recognition of Computers as persons' (1985) In IJCAI pp. 1271-1273.

<sup>13</sup> See the Copyright, Designs and Patents Act (CDPA)

<sup>14</sup> A Guadamuz, Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works (2017).

negative commercial implications as computer code and databases. In his final analysis, he recommends that the model adopted in the UIC, despite its limitations, be followed more widely around the world. Presenting his views in the form of a trial dialogue, Shammad Basheer<sup>15</sup> grapples with the issue of who possesses rightful IP ownership to an invention, for the AI system that then generates the invention or is it the person who coded/created the software, the AI system itself. In his final analysis, Basheer found that, under current law, the patent cannot rest with either, since machines cannot yet be considered inventors or authors. The IP rights fall to the public domain or the commons, free to be used by all. Mark Perry and Thomas Margoni<sup>16</sup> seem to agree with this view, arguing that it is a much more efficient allocation of resources compared to its alternatives.

### **2.3 Questions of Human Dignity**

Nick Bostrom<sup>17</sup> examined whether the intersection of artificial intelligence and body-mind argumentations is a threat to human dignity. Bostrom ultimately aligned himself and towed the part of the trans-humanists, who believe in the widest possible technological choices for the individual, and addressed the concerns of the bioconservatives, who call for a ban on human argumentation. His underlying argument is that dignity is not restricted to the current state of humanity alone as post-human dignity is a definite possibility. On their part, Jason Borenstein and Yvette Pearson<sup>18</sup> discussed the application of artificial intelligence (specifically robots) in the field of Caregiving. Utilizing a capabilities approach analysis, the authors believe that the use of robots can maximize care and freedom for recipients of such care.

However, author such as Noel Sharkey<sup>19</sup> is not in favour of utilizing artificial intelligence for care-giving, whether it be the care of children or geriatrics. As regards the former, he notes that severe dysfunction occurs in infants (although the tests have been conducted only on animals so far) that develop attachments to inanimate entities. As regards the latter, he notes that leaving the elderly in the exclusive care of machines would deprive them of the human contact that is provided currently by caregivers.

At a broader level, Jon Kofas<sup>20</sup> examined the impact of artificial intelligence on the cyber-generation, that is the class of people for whom video games, cell phones and computers are the reality. According to the author, artificial intelligence will create an impact on the sense of identity and community in society, by undermining community culture and creating a world where transhumanism will be the norm. He paints a picture of an artificial intelligence household, the wealthier families will have androids in their homes, most likely helping to raise and educate their children, conditioning them about the existential nature of robots as an integral part of the family like the loveable dog or cat. The less affluent middle class would be able to rent a robot for the ephemeral experience of it. The lower classes will feel even more marginalized because artificial intelligence robotics will be out of reach for them; in fact they will be lesser beings than the robots whose intelligence and functions will be another privilege for the wealthy to enjoy. Be that as it may, if AI entities are granted personhood right, they should be allowed to enjoy dignity similar to that accorded human beings as doing that is not a threat to the pre-existing human dignity.

### **2.4 Ethics in Algorithms/Machine Learning**

Algorithms form one of the pillars on which artificial intelligence-based applications are created. Understanding the ethical and social shortcomings of algorithms themselves is thus important. Mike Ananny<sup>21</sup> came up with three ethical dimensions through which to access a networked information algorithm (NIA). The three dimensions are: The Kantian (the study of what we ought to do), Utilitarian

<sup>15</sup> *Op. Cit*

<sup>16</sup> M Perry and T Margoni, 'From Music Tracks to Google Maps: Who owns Computer-generated Works?' (2010) 26(6) Computer Law and Security Review, 621-629.

<sup>17</sup> N Botrom, 'In Defence of Posthuman Dignity: Bioethics' (2005) 19(3) 202-214.

<sup>18</sup> J Borenstein, and Y Pearson, 'Robot Caregivers: Harbingers of Expanded Freedom for All?' Ethics and Information Technology (2010) 12(3), 277-288.

<sup>19</sup> N Sharkey, 'The Ethical Frontiers of Robotics Science' (2008) 322 (5909) 1800-1801.

<sup>20</sup> J Kofas, 'Artificial Intelligence: Socio-economic, Political and Ethical Dimensions – Counter Currents' (2017) available at <http://www.countercurrents.org2017/04/22> accessed 6 November 2022.

<sup>21</sup> M Ananny, 'Toward an Ethics of Algorithm: Convening, Observation, Probability and Timeliness Science Technology and Human Values' (2016) 41(1), 93-117.

(Maximum benefit for maximum number) and Virtue (duty and consequences) models. In the first place, Ananny looks into the manner in which algorithms create associations, whether it be political affiliation, sexuality or even a medical condition, and points out that it is doubtful whether these associations reflect real life patterns. Secondly, he states that algorithmic decision making is based on recognizing patterns and similarity. This creates ethical issues such as a false sense of certainty, the discouragement of alternative explorations and the creation of apparent coherence among disparate objects. Finally, the author noted that the disparate focus on time-bound action of an algorithm leads to a situation in which accuracy may be compromised.

On their part, Friedler et al.<sup>22</sup> examined the meaning of a ‘fair algorithm’ borrowing from the philosophical as well the computer science community. According to them, bias in algorithmic output stems from the choosing of the ‘feature space’. They provide a mathematical definition of fairness; and demonstrate that fairness in output depends on the interactions between the construct space, observed space and the decision space of the algorithm. Noting that algorithms and social actors are inherently different, Anderson and Sharrock<sup>23</sup> states that while the former is bound by mathematical instructions, the latter can exercise discretion. However, they do not believe that fact and ethics are irreconcilable because despite being products of rationality, algorithms can be relied on to make satisfactory ethical decisions. As such, if artificial intelligence entities such as algorithms behave as humans and recognized by law as such, they should be considered in line with humans on ethical perspective.

Some of the ethical issues involving algorithms/machine learning can be resolved by aligning the objectives of machines with those of humans ensuring both work toward the same goals. These values can either be imparted during the programming stage, or by the artificial intelligence itself observing in and learning from its environment. The top-down approach reflects the former, where the artificial intelligence would be trained to compute the consequences of all its actions before narrowing on the one it decides to undertake. The bottom-up approach depicts the latter, where the artificial intelligence derives answers from its experiences, making it more spontaneous.

Nick Bostrom<sup>24</sup> on his part compared super-intelligent artificial intelligence to general artificial intelligence but opined that it will surpass humans by much more. According to him, the only precaution against such kind of intelligence is to program empathy as one of its core objectives. Once this is done, exponential improvement will lead to an enhancement of this quality, thereby diluting artificial intelligence’s potential threat to mankind. Bostrom also addressed arguments that call for a halt to artificial intelligence development due to its dangers. He states that artificial intelligence is inevitable, thus, utilizing precautionary measures before destructive artificial intelligence is built would be a better solution.

The argument and stance of this author seems congruent and apposite considering the spate of development in artificial intelligence technology. Putting in place precautionary measures in artificial intelligence entities to checkmate their operations and prevent them from embarking on detrimental frolic ventures is indeed a good option.

## **2.5 Accountability Mechanism**

A popular method of ensuring accountability in the algorithm is through openness and transparency. This would enable the examination of the algorithm, its source and its implications on those who would ultimately be the recipients of the decisions made by such algorithms<sup>25</sup>. Academics have agreed for disclosure of source code to restore ‘a feeling of fairness’<sup>26</sup> to eliminate capacity<sup>27</sup> and also to enable

<sup>22</sup> S. A. Friedler, C Scheidegger and Venkata Subramanian, ‘On the Impossibility of Fairness’ (2016) arxiv preprint arxiv: 1609.07236.

<sup>23</sup> R J Anderson and W W Sharrock, ‘Ethical Algorithms: A Brief comment on an extensive Muddle’ (2013) available at <http://www.sharrockanderson.co.uk/up-content/uploads/2017/04/Ethical-Algorithms.pdf> accessed 6 November, 2022.

<sup>24</sup> N Bostrom, ‘Ethical Issues in Advanced Artificial Intelligence, Science, Fiction and Philosophy: From Time Travel to Super intelligence’ (2003) 277-284.

<sup>25</sup> K James, Open Data? The Challenges of Algorithmic Accountability in Big Data (2013); N Diakopoulos, Algorithmic Accountability Reporting: On the Investigation of Black Boxes (2013).

<sup>26</sup> C O’ Neil, Weapons of Math Destruction (2016).

<sup>27</sup> F Pasquale, The Black Box Society (Harvard University Press, 2016) p. 106.

reverse engineering.<sup>28</sup> However, others have pointed out that sheer complexity in machine learning systems means that being able to understand the algorithm in action, during course of learning, is unlikely.<sup>29</sup>

However, some authors<sup>30</sup> dispute the effectiveness of accountability, stating that such is made difficult by the apparent inaccessibility, complexity, obscurity, and intellectual property challenges posed by algorithms and the organizational settings within which they operate. Diakopoulos<sup>31</sup> observed that transparency as a solution is limited by:

- (i) The fact that algorithms, more often than not, amount to trade secrets; making them transparent flies in the face of this concept.
- (ii) The high overhead costs that are incurred when algorithms are subject to transparency rules, unlike data transparency.

He therefore suggests reverse engineering as an alternative to transparency to act as a check on algorithmic power. This reverse engineering is the process of articulating the specifications of a system through a rigorous examination drawing on domain knowledge, observation, and deduction to unearth a model of how that system works.<sup>32</sup>

Obviously, accountability in artificial intelligence entities especially algorithms brings into limelight issue of openness and transparency. And it is the openness and transparency in the act of such artificial intelligence entities that determines whether they have acted in the proper way or manner, either on their own or with the help of any other factor in the course of their operations in order not to envisage or contemplate bias. When this is determined it will help in determining their liability or otherwise.

## **2.6 Intellectual Property Issues/Rights**

Schafer<sup>33</sup> believes that AI impacts Intellectual Property (IP) Laws in two ways:

- (i) AI is being used to design creative works, either along with humans or entirely on their own. Whether the traditional notions of 'creator', 'inventiveness' and 'original' will be relevant with regard to AI is yet to be seen.
- (ii) AI's dependence on others' creative works. Being primarily data-driven, AI will require great amounts of input which can all be subject to different IP regimes potentially hindering economic access.

Apart from authors of creative works, Schafer<sup>34</sup> also notes AI's impact on IP as regards the legal profession. Lawyers will be forced to provide value in the IP sector, either instead of or in conjunction with AI. This part of the research work examines whether IP rights can be said to exist in AI-driven work in the first place, and if so, the attributability of the same. A brief overview is also provided of some copyright applications as well as AI's contribution to intellectual property management.

Some authors made some contributions as regards the possibility of intellectual property rights on artificial intelligence entities. They pose some questions such as: Can IP rights be said to exist at all, when they arise from entities that are not human? Thomas Sorjamaa<sup>35</sup> argues that if copyright's primary role is to incentive the production and dissemination of creative works, it would not be advisable to leave AI-produced work out of its realm. If the premise is correct, copyright law must then be able to develop to respond to technological challenges such as this one. On analyzing existing case law and scholarship on

<sup>28</sup> N Diakopoulos, 'Algorithmic Accountability Reporting: On the Investigation of Black Boxes, Tow Centre for Digital Journalism' (2015).

<sup>29</sup> J Burrell, 'How the Machine Thinks: Understanding Opacity in Machine Learning Algorithms, Big Data and Society' (2016) 1-12.

<sup>30</sup> D Neyland, 'Bearing Accountable Witness to the Ethical Algorithmic System – Science Technology and Human Values' (2016) 41(1), 50 – 76.

<sup>31</sup> *Ibid*

<sup>32</sup> *Ibid*, P. 13, N Diakopoulos, 'Algorithmic Accountability: Journalistic Investigation of Computational Power Structures, Digital Journalism' (2015) 3(3) 398 – 415.

<sup>33</sup> B Schafer, *The Future of IP Law in an Age of Artificial Intelligence* (2016).

<sup>34</sup> *Ibid*

<sup>35</sup> T Sorjamaa, 'Author-Authorship and Copyright in the Age of Artificial Intelligence', Master's Thesis Svenaka Handelshogskolan, 2016.

the matter, Annemerie Bridy<sup>36</sup> indicates that copyright protection is presently granted, however, she restricts her analysis to psychographic works and procedurally generated artworks.

Erica Fraser,<sup>37</sup> on her part described AI techniques such as genetic programming, artificial neural network and robot scientists that are used to generate inventions. She notes that patents have earlier been granted for inventions using AI and that the method of creation of the invention does not seem (so far) to factor into the patent granting process.<sup>38</sup> However, she sees a need to redefine inventiveness and patentability in light of the increased role played by computer programs in the inventive process.

To identify the existence of an inventive step in patent, it becomes important to identify the notion of 'person of ordinary skill in the art.' Since AI will effectively raise, the skill level of ordinary inventors, this notion must be rethought in light of the contemporary inventor and the technology she typically might use. Similarly, the vast knowledge that AI technologies possess must be taken into account when assessing obviousness, failing which there will be a flood of patent filings and grants. Both Shammad Basheer<sup>39</sup> and Ryan Abbot<sup>40</sup> seem to agree with the idea that this test would need rethinking in light of AI. But on his part, Samuelson<sup>41</sup> resorts to this only in the event that:

- (i) The ownership dilemma cannot be resolved satisfactorily through the application of traditional authorship tests; and
- (ii) Joint authorship as a concept proves to be unworkable.

In the context of completely autonomous AI systems, Fraser is of the opinion that patentability should not be denied.<sup>42</sup> She calls for the evolution of the law toward wider patentability except in situation where there is a sound policy reason not to. Examining whether AI-inventions fit within the incentive justification of the patent system, she notes in the affirmative, stating that there are economic and social benefits to innovation that will arise as a result of patenting AI-led innovations.

Vertinsky and Rice<sup>43</sup> on their part call for an increase in the 'utility' threshold in a world where there are AI-led inventions. This would ensure that 'useful' ideas are granted patents, but the mere generation of 'new' ideas which will become easier to do with machines will not. Lasse Overlier<sup>44</sup> obtains industry perspective on this issue through his thesis. While the predominant view with regard to patents is that it is not possible under current laws, respondents seemed more positive as regards copyright protection in the era of machine learning technologies.

### **3 THE CHALLENGES OF CRIMINAL LIABILITY OF ARTIFICIAL INTELLIGENCE ENTITIES**

As earlier noted, there are challenges hindering some of the effort being made towards prosecuting AI entities and the general enforcement of AI related offences. These challenges are discussed below:

#### **3.1 The Problem in detecting the *mens rea* of Artificial Intelligence Entities**

The general position of the law is that for a crime to be said to have been committed by a person or an entity, there must be in existence the *actus reus* (physical act) and *mens rea* (internal/mental act). And for one to be adjudged guilty of such crime, such physical and mental acts or omission has to be wrong or blame-worthy except in some offences which can be negated by some defenses and strict liability offences which does not require such element.

<sup>36</sup> A Bridy, Coding Creativity: Copyright and the Artificially Intelligent Author, Stan. Tech L. Rev., (2016), p. 1

<sup>37</sup> E Fraser, Computers as Inventors-Legal and Policy Implications of Artificial Intelligence on Patent Law (2016) Scripted 13, 305.

<sup>38</sup> *Ibid*, p. 319

<sup>39</sup> S Basheer, Artificial Invention: Mind the Machine, scripted, (2016) 13, 334.

<sup>40</sup> R Abbot, I Think, Therefore I Invent, Creative Computers and the Future of Patent Law, (2016) BCL Rev. 57, 1079.

<sup>41</sup> P Samuelson, Allocating Ownership Rights in Computer-Generated Works, U. Pitt. L Rev. (1985) 47, 1185

<sup>42</sup> Fraser *Ibid*, p. 324.

<sup>43</sup> L Vertinsky and T M Rice, 'Thinking about Thinking Machines: Implications of Machines Inventors for Patent Law' (2002), *SBUJ Science and Technology Law*, 574.

<sup>44</sup> L Overlier, 'Intellectual Property and Machine Learning: An Exploratory Study', Masters Thesis, 2017.

Thus, it is difficult to detect/prove the intention (*mens rea*) of artificial intelligence entities such as computer soft wares/programs or robots but with the aid of Turing Test and the liability models proposed/advocated by Hallevy<sup>45</sup>, such burden of proof/task may be made easier.

### **3.2 Challenges of Jurisdiction in Matters Relating to Artificial Intelligence Entities**

Determining the jurisdiction in matters relating to cybercrimes/software crimes and crimes involving artificial intelligence entities is indeed a difficult one. This challenge undoubtedly hampers the investigation and possible prosecution of such crimes.

### **3.3 Challenges of Ascertaining the Location of Artificial Intelligence Entities Offenders**

The difficulty in ascertaining the location and identity of the offender in Artificial Intelligence Entities related offences is one of the biggest challenge as regards their liability for offences. The shapeless nature of the internet makes it difficult to ascertain the location and identity of internet offender and this makes the enforcement of internet related crimes difficult.

Thus, a computer program installed in Nigeria may be hacked in United State of America or some other European countries. When this is the case, it becomes glaringly difficult to identify the location of the offender who may upon hacking the computer program or committing the offence relocate to another country or destination undisclosed.

### **3.4 The Challenge of Age/Capacity of Artificial Intelligence Entities Offenders to commit Crime**

The age/capacity to commit offence(s) is another challenge in artificial intelligence entities related offences. Thus, most internet offenders are juvenile offenders and this renders their prosecution nearly impossible. Also, the status of AI entities in relation to criminal liability is before now not known or defined.

### **3.5 The Challenge of Data Encryption**

Data encryption is a technology which protects computer information from unauthorized access. This is a technique to convert data into an unintelligible form that cannot be reconverted into the original format without a secret decryption key.<sup>46</sup> Thus, this data encryption prevents easy access to computer technologies and bars possible recovery or gathering of information that may be of help in prosecuting internet offences/offences committed by artificial intelligence entities.

### **3.6 Lack of Adequate Laws for the Regulation of Offences involving Artificial Intelligence Entities**

There is currently no adequate laws for the regulation of offences involving artificial intelligence entities both in Nigeria and foreign countries. This lack of adequate domestic and international legal regime for the regulation and enforcement of internet crimes contribute mainly in the challenge inherent in the prosecution of offences involving artificial intelligence entities and the attendant lack of judicial solution in that regard.

### **3.7 Punishment/Sentencing Challenges**

Even when an artificial intelligence entity is adjudged guilty of a particular offence, the punishment to be meted on such entity is always a big challenge to the judiciary. The question that arises here are: what should be done after an artificially intelligent being is held criminally liable and what punishments or measures should be taken. After the trial and conviction of an artificial intelligent entity, the court is supposed to sentence that artificial intelligence entity. If the most appropriate punishment under the specific circumstances is one year of incarceration, for example, how can such an artificial intelligent entity serve such a sentence? How can capital punishment, probation, or even a fine be imposed on an artificial intelligence entity? In instances where there is no body to arrest (especially in cases of artificial intelligence software that was not installed in a physical body, such as a robot), what is the practical meaning of incarceration? Where no bank account is available for the sentenced artificial intelligence entity, what is the practical significance of fining it?

<sup>45</sup> G Hallevy 'The Criminal Liability of Artificial Intelligence Entities – From Science Fiction to Legal Social Control' (2010) 4 *Akron Intellectual Property Journal*, 71

<sup>46</sup> K Nandan, *Law Relating to Computers, Internet and E-Commerce* (5th edn., India; Universal Law Publishing Co. PVT. Ltd, New Delhi, 2014) pp. 96-99.



Similar legal problems have been raised when the criminal liability of corporations was recognized.<sup>47</sup> Some asked how any of the legitimate penalties imposed upon humans could be applicable to corporation.<sup>48</sup> The answer was simple and legally applicable. When a punishment can be imposed on a corporation as it is on humans, it is imposed without change.<sup>49</sup> When the court adjudicates a fine, the corporation pays the fine in the same way that a human pays the fine and in the same way that a corporation pays its bills in a civil context.<sup>50</sup> However, when punishment of a corporation cannot be carried out in the same manner as with humans, an adjustment is required.<sup>51</sup> Such is the legal situation vis-à-vis artificial intelligence entities.

Thus, most common punishments are applicable to artificial intelligence entities. The imposition of specific penalties on artificial intelligence entities does not negate the nature of these penalties in comparison with their imposition on humans. Of course, some general punishment adjustment considerations are necessary in order to apply these penalties, but still, the nature of these penalties remains the same relative to humans and to artificial intelligence entities.

## CONCLUSION

From the discussion so far it was glaringly revealed that artificial intelligence entities just as human beings may be commit offence(s) either by themselves or through them by their developers/programmers or instructors, controllers or users. This is because the fourth industrial revolution has undoubtedly engendered their growth and development with little or no safeguard measures put in place against their malfunction. Some of these AI entities can learn from the environment and grow beyond its earlier intended use/purpose and become serious threat to human beings and society at large.

In the same vein, even when such AI entities are seen to have committed an offence or participated in the commission of an offence, some issues and challenges render their prosecution difficult, if not impracticable leaving a very deep gap in administration of criminal justice delivery in that regard.

Sequel to these observations, issues and challenges, it is recommended in this article that the personhood and personal rights of artificial intelligence entities should be recognized and made definite by the relevant laws and penal statutes. If this is done they could be held directly liable for their action or inaction. For easy identification and possible prosecution, artificial intelligence entities should be classified for the purposes of criminal liability and where they could not be held directly liable for offence committed, their developers/programmers, users, controllers or instructors should be held liable just like corporations going by the principle of 'lifting the veil'. If the recommendations put forward in this paper are heeded, it is believed that the issues and challenges hampering the criminal liability of these AI entities as above seen and other envisaged ones will be maximally addressed if not totally contained.

<sup>47</sup> G E Lynch, 'The Role of Criminal Law in Policing Corporate Misconduct', (1997), 60 *Law and Contemporary Problems*, 23; R Gruner, 'To Let the Punishment Fit the Organization: Sanctioning Corporate Offenders Through Corporate Probation', (1988), 16 *AM J. Crim. L. J*; S Walt and W S Laufer, 'Why Personhood Doesn't Matter: Corporate Criminal Liability and Sanctions', (1991) 18 *AM J. Crim. L.*, 26; J C Coffee Jr., 'No Soul to Damn: No Body to Kick': An Unscandalised Inquiry into the Problem of Corporate Punishment, (1981), 79 *Mich. L. Rev.* 386; S Box, *Power, Crime and Mystification* (1983) p. 16-79; B Fisse and J Braithwaite, 'The Allocation of Responsibility for Corporate Crime: Individualism', (1988) 11 *Sydney L. Rev.* 468, 474 – 510.

<sup>48</sup> See Fisse and Braithwaite *Ibid.*, p. 468.

<sup>49</sup> See for example J O'Reilly, D Pitney, *Criminal Liability of Companies Survey* available at [http://www.lexmundi.com/images/lexmundi/PDF/Business\\_Crimes/crim\\_Liability\\_USA-New%20jersey.pdf](http://www.lexmundi.com/images/lexmundi/PDF/Business_Crimes/crim_Liability_USA-New%20jersey.pdf) accessed on 24 November, 2022.

<sup>50</sup> J O'Reilly and D Pitney, *Ibid.*

<sup>51</sup> J C Coffee *Ibid.*, pp. 424-434.