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An In-Depth Analysis of the Applicability of
Artificial Intelligence in Finance with the
Prospects and Limitations in its Applied Aspects

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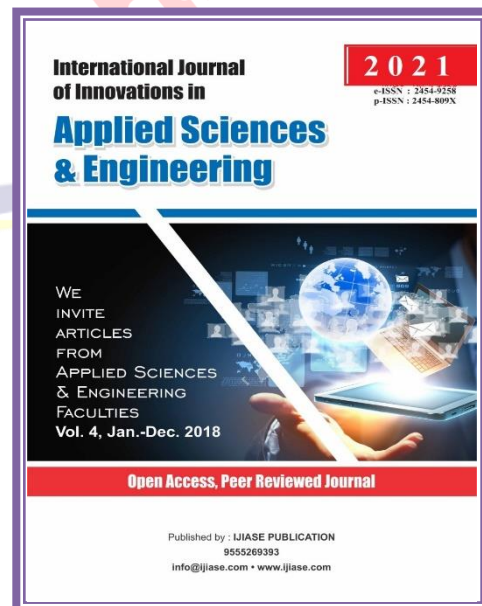
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ABSTRACT

Artificial Intelligence, near one of its main subsets, AI (ML), is presently not sheer promulgated. It has nearly turned into an easily recognized name. However, using the term artificial Intelligence by people in general and, on occasion, technologists is often a misnomer. This paper investigates Artificial Intelligence and ML, framing the primary classes of broad ML algorithmic procedures. Critically, it gives a convenient timetable and differentiation between the team while acquiring numerous focal points similar to their actual capacities in the money business, covering the ternion of monetary, administrative and protection advancements (FinTech, RegTech, InsurTech). Positively, artificial intelligence/ML has tracked down pragmatic applications in finance; whether it is creating bits of knowledge on client spending, acquiring informed guaranteeing risk results, recognizing odd financial exchanges or associating with clients utilizing normal language, artificial intelligence/ML possibilities in finance is picking up critical speed in this day and age of close to omnipresence Web of Things (IoT), high-level processing and media transmission advances. Without making light of the likely capacities, what is less sure anyway is whether there are any boondocks to its applications in money and whether it will give panaceas to the squeezing difficulties, exceptionally comparable to straightforwardness from an aggregate perspective of artificial intelligence/ML arrangement plan, improvement and execution.

INTRODUCTION

Artificial Intelligence is quickly advancing in the new computerized age and economy, evidently turning into the mantra of the cutting-edge society. This is part of the way because its applications influence varying backgrounds, including a few businesses and areas, going from medical services and teaching through assembling and broadcast communications to regulation and money.

There has been a remarkable expansion in bargains connecting with Artificial intelligence speculations made by funding firms, uncovering artificial intelligence acquisitions more than sextupled somewhere

between 2015 and 2020 alone. The worldwide artificial intelligence market is on target to achieve incomes of around 310 billion USD by 2026, demonstrating a build yearly development pace of about 40% compared with 60 billion USD in 2021. It has additionally been placed that the worldwide market for voice-actuated advanced colleagues will be worth around 8 billion USD by 2025. The most excellent projection yet has been that Artificial Intelligence could contribute approximately 16 trillion USD to the worldwide economy by 2030 [1]-[3].

In a quickly changing society where the worldwide market is profoundly proactive and savagely cutthroat, no industry wants to

be abandoned in the Artificial intelligence trend. It is no big surprise the typically safe money industry is, as of late appearance, its dynamic side. Advertisers in banking and protection areas utilize artificial intelligence/ML answers to identify their customers better, make enticing advancements, drive their organizations and further develop efficiency [4].

Positively, artificial Intelligence gives an abundance of actual open doors given the valuable jobs it can play inside the general public in providing various kinds of knowledge (e.g., self-empowered, helped, edge, expanded, area, independent, constant consistent, social, and so on.), all of which mean sizeable efficiency gains.

ARTIFICIAL INTELLIGENCE/ML TIMETABLE

Table I gives a synopsis of the critical occasions in the Artificial Intelligence/ML world from around 1930 to 2021 [8] - [12].

Notwithstanding, there's a gamble that these could be seen entirely economically as seriously extraordinary or troublesome. While the offshoots of artificial intelligence examination are now demonstrating that its groundbreaking possibilities are faltering and almost perpetual, there are additional worries with each new or quickly advancing innovation.

Further segments of the paper have been coordinated as follows: segment II dissipates the disarray in the more extensive local area regarding what artificial Intelligence truly is versus ML. The segment presents the vital kinds of Artificial Intelligence and Artificial Intelligence and ML subfields.

<i>Period</i>	<i>Development Activity/Notable Achievement</i>
1930's & 1940's	<ul style="list-style-type: none"> - Golden era of science fiction - The first case of neurons and how they work by Warren McCulloch and Walter Pitts - The first stored-program computer, Manchester Mark 1
1950's	<ul style="list-style-type: none"> - Can machines think? By Alan M. Turing in a research paper: "Computing Machinery and Intelligence" - The first Neural Network (NN) machine, SNARC (Stochastic Neural Analog Reinforcement Calculator), by Marvin Lee Minsky; followed by the first Artificial NNs (ANNs), Perceptron, by Frank Rosenblatt's group; and Adaptive Linear Neuron/Element (ADELINE) and MADELINE (multilayer ADELINE) by Bernard Widrow & Ted Hoff - Logic Theorist, the first AI program, Dartmouth Summer Research Project
1960's	<ul style="list-style-type: none"> - Defense Advanced Research Projects Agency (DARPA) funds AI and computer science at MIT (Massachusetts Institute of Technology), Stanford University (SU) and Carnegie Mellon University (CMU) - ELIZA, one of the first chatterbots (chatbots), a Natural language Processing (NLP) program by Joseph Weizenbaum - AI predicted to match or exceed human intelligence by the year 2001 (Arthur C. Clarke and Stanley Kubrick)
1970's	<ul style="list-style-type: none"> - Technical problem statements and propositions for Support Vector Machines (SVMs), recurrent algorithms, pattern recognition, deterministic approaches, and probabilistic ML - The first computer-controlled autonomous vehicle, the Stanford Cart
1980's	<ul style="list-style-type: none"> - Neocognitron, a deep, hierarchical multi-layered Convolutional NN (CNN) proposed by Kunihiko Fukushima - Introduction of Expert Systems by Edward Feigenbaum - The Connection Machine, a massively parallel computer for AI, by William Daniel Hills - Japan's Fifth generation computer project, focusing more on advanced NNs - The first autonomous car, Navlab 1, by CMU - Further advances in NNs/multilayer NNs e.g., back-propagation algorithm
1990's & 2000's	<ul style="list-style-type: none"> - Further advances in SVMs and autonomous vehicles - IBM Deep Blue machine, a chess-playing computer, defeats Gary Kasparov - Dragon NaturallySpeaking – first publicly available speech/voice recognition software program, by Dragon systems - First Official RoboCup - iRobot Roomba floor vacuuming robot - Ray Kurzweil predicts "The Singularity" to occur in 2045, where AI outperforms human intelligence
2010's	<ul style="list-style-type: none"> - IBM's Watson Machine, running Deep QA software, wins Jeopardy - NLP assistants for smart phones, including SRI's Siri, Google Now and Microsoft Cortana - Google Brain team research into deep learning (DL) AI - New ANN and CNN architectures, including AlexNet, ImageNet, U-Net, ResNet, etc. - Facebook DeepFace - AWS ML service - OpenAI Generative Pre-Trained Transformer 2 (GPT-2) - DeepMind AlphaGo, AlphaZero, AlphaStar, AlphaFold, MuZero, etc.
2020's	<ul style="list-style-type: none"> - Further advances in deep CNNs e.g., RegNet by Facebook AI Research (FAIR) - Possibility of AI helping to diagnose dementia in 24 hours - Facebook SEER (Self-supERvised) computer vision model - OpenAI DALL-E (a 12-billion parameter version of GPT-3) and NN-based CLIP (Contrastive Language-Image Pre-Training)

THE POSSIBILITIES

Fig. 1 gives the conceivable outcomes scene of Artificial Intelligence in finance talked about in this part.

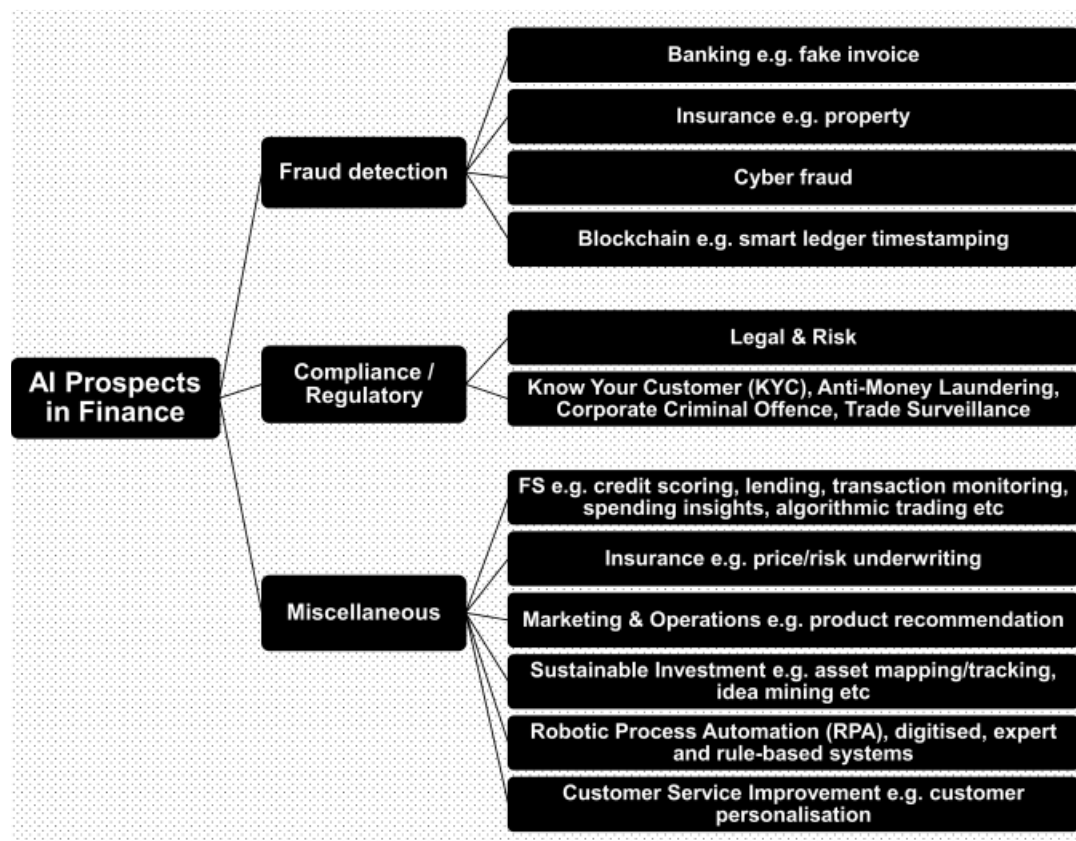


Fig. 1. The possibilities landscape.

A. Extortion location and consistency

Monetary extortion is conceivable across protection and banking areas, notwithstanding blockchain and network safety fields (as portrayed in Fig. 3). Monetary extortion and cybercrime cases give off an impression of being predominant lately, halfway because of advances in innovation in various fields, for example, the

IoT, information examination, organizing and unavoidable knowledge. People and associations should be furnished with information and present-day innovation apparatuses and procedures to reliably remain in front of fraudsters, particularly given the continually creating strategies embraced by culprits of these wrongdoings. This subsequently makes ML frameworks significant above dependence on the use of

conventional guidelines-based frameworks, which may not be suitable for reason in distinguishing false examples that are epitomized by novel, arising or time-advancing abnormalities.

Given various ML techniques (administered, solo, united, half-breed, and so forth) and a comprehensive exhibit of ML algorithmic procedures, there is an immense potential for using ML in misrepresentation discovery like never before. Anomalies or strange utilization designs in credit or charge exchanges, solicitations, KYC, exchanging and illegal tax avoidance exercises, and corporate criminal offences (CCOs) can be distinguished by utilizing Artificial intelligence frameworks in filtering through and evaluating different thousands to billions of value-based practices and documentation, performing exposure audit of information weighty cases in danger of KYC encroaches or CCOs. As of late, a few new businesses (e.g., WeCash) and laid out top firms (e.g., JPMorgan) in the FinTech, InsurTech and RegTech space are quickly sending Artificial intelligence arrangements in monetary corporate navigation, client support upgrades, further developed loaning administrations and consistency [13].

Past norm and conventional factual methodologies, demonstrating and examination, research has shown the way that utilizing ML procedures, for example, NNs or DL, can be essential in the FS area given the storm of information accessible in the present super associated world, for instance, in the space of credit scoring, which now and again have shown that precision improvement of financial assessment expectations by up to 15% can be achieved [19]. A definite report embraced regarding misrepresentation forecast in property insurance utilizing accurate miniature information from a significant Brazilian insurance agency has shown that the reception of ML arrangements in evaluating property protection contract cases can be helpful, with differentiated consequences of nine prescient ML models giving correctness going from around 71% to 85% [17].

B. Different

Aside from the arrangement of constant monetary extortion identification and consistency arrangements with regards to guidelines like Business sectors in Monetary Instruments Mandate (MiFID II), Capital Prerequisites Order (CRD V), Basel IV, and so on., to some extent tapped and completely undiscovered possibilities of artificial

Intelligence in finance incorporate (yet may not be restricted to) the accompanying:

- Utilizing ML for complex FinTech and InsurTech network demonstrating - giving credit, capital, edge valuation changes, exchanging cost and protection risk guaranteeing, and so on., working with the transforming of information into significant bits of knowledge and noteworthy insight in a sped-up style to create strategic advantage.
- Utilizing ML for tasks, promoting and client support enhancements - giving information-driven and methodology moulding experiences (e.g., laying out successful missions, client spending, anticipating client's inclination to beat, time to stir, and so on.), as well as relevantly appropriate start to finish client experience given signs of goal (e.g., customized item proposal).
- Utilizing ML, colossal information and IoT advancements for continuous prescient, prescriptive, unmistakable or demonstrative examination relying upon the use case.
- Utilizing ML for master frameworks and RPA, where information regarding dull consistency processes, including human association, can be self-empowered while additionally applying data sets of information

and rules to mechanize the most common way of making surmising from the report.

THE DIFFICULTIES

Fig. 4 shows the dangers site of Artificial Intelligence in finance examined in this segment, while Table II gives a few expected measures for dealing with these dangers [29].

A. Morals and transparency

Each call, industry or area typically has sets of rules or moral rules which set out center liabilities, ways of behaving, values or ethos (e.g., trustworthiness, secrecy, responsibility, regard for regulation, and so on.) expected of those experts whose calling are adjusted, or subject, to that particular area. Positively, the money business is the same, so ML arrangements in the region need to bear moral onuses.

Morals will only be sufficient to imply straightforwardness, something yet to be boundless in ML. The creators in [20] attempted a broad review into predisposition and decency in ML, giving over 20 kinds of inclinations (e.g., verifiable, collection, examining, social, prominence, spectator predispositions, and so on.), referring to certifiable models like COMPAS (Restorative Guilty party The executives Profiling for Elective Assents) programming

to feature essentially how ML arrangements can be biased toward a specific characteristic (e.g., sex, religion, race, marital status, inability, age, and so on.) in navigation. Without bearing moral obligations by engrossing straightforwardness and decency as center structure blocks of every ML-based FS arrangement, there is an immense danger of risking vital and extraordinary choices, mainly where results are chosen by the ML calculation (e.g., credit scoring for contract loaning). The requirement for straightforwardness in Artificial intelligence monetary arrangements' algorithmic navigation is imperative, close to preventing oblivious predisposition and mystery in the plan, assembly and execution of such agreements.

Straightforwardness in ML is critical; interpretability does as well, or reasonableness, which is its central trait. Utilizing ML in finance is, without a doubt, vital with bunches of chances. Still, suspicion stays, practically speaking, particularly on those results, including navigation regarding the trustworthiness of such choices, whether they are absent any trace of segregation. This is probably not going to change until the test of deciphering results from ML-based credit scoring calculations becomes ultimately

settled by installing straightforwardness into the arrangement plan and fabricating cycles to permit the results of such measures to be reasonable [13], [19], [28].

While it's been recognized that there's no genuine agreement about what interpretability is or will be, in ML, at least, it is expected that the extent of interpretability ought to cover neighbourhood, particular, worldwide and comprehensive levels, as the information researchers, engineers, designers and developers work cooperatively to fabricate artificial intelligence arrangements [21], [22]. This will be vital to address questions about reasonableness, security, honesty, unwavering quality, causality and trust. Each ML arrangement in finance should have the option to answer explicit requests covering:

- Algorithmic straightforwardness - how has the calculation made the model?
- Model interpretability or reasonableness - how did the prepared model make forecasts?
- Model causality concerning demonstrating straightforwardness or interpretability - how is an individual or different pieces of the model influencing expectations?
- Model uprightness or dependability regarding show straightforwardness or

interpretability - for what reason did the model make a specific expectation for an occasion or certain expectations for a gathering of examples?

- Trust or reasonableness regarding display straightforwardness or interpretability - how, by and by, does the model purpose any irregularity among assumption and reality with a supporting clarification?

B. Government Regulatory control

In 2016, the Unified Realm's Public Science and Innovation Board gave a report looking at the possible job of unofficial laws in Artificial Intelligence. While it prescribed the foundation of a commission to inspect the social, moral and legitimate ramifications of Artificial Intelligence, it suggested no particular regulation be considered [23]. Since then, the issue got little consideration from officials until the uncovered Facebook-Cambridge Analytica information commandeering embarrassment in 2018 [24].

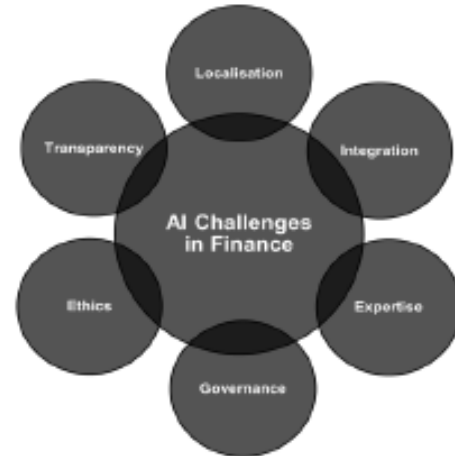


Fig. 2. The threats landscape.

Given the shortfalls of Facebook-Cambridge Analytica [25] and Clearview Artificial Intelligence [26], among others, new administrative systems are essential for the utilization of information and how worth is produced from it. It is feasible to utilize complex ML and DL apparatuses to send off nosy framework assaults to get sufficiently close to delicate frameworks and data that could prompt monetary and cybercrimes or produce "counterfeit" news on well-off, unmistakable or politically uncovered people.

Past the Overall Information Security Guideline (GDPR), severe discussions about Artificial intelligence strategy and morals will be imperative to control the utilization of Artificial Intelligence in the present hyperconnected advanced society and

advanced economy portrayed by unavoidable knowledge and social strength. Much like bodies like the Monetary Direct Power (FCA), Contest and Markets Authority (CMA), Government Fair Loaning Guidelines, etc., administrative bodies and organizations should be particularized for Artificial intelligence administration. Different partners will be associated with directing Artificial Intelligence in the money business (counting worldwide money associations, state-run administrations and their national banks, Fintech, InsurTech and RegTech organizations) to lay out what, where and how to manage. Questions confronting the controller concerning what to direct will incorporate whether individual, gatherings, or the whole of protection, injustice, calculations, and separation inclination should be managed. With applicable guidelines and norms set up, the journey of guaranteeing straightforwardness in artificial Intelligence may be understood.

C. General/different

The expense of creating in-house or executing business off-the-rack Artificial intelligence arrangements custom-made for FS applications can be extremely high, to a limited extent, because of the intricacy of coordinating Artificial intelligence

arrangements with existing heritage or restrictive cycles and frameworks, some of which may not locally support ML. Broad utilization of monetary information application programming connection points with other economic system applications, siloed information stores, instalment passages, and so forth., poses a danger that could influence the functionality and precision of any ML arrangements being executed.

Expecting cost is not a significant boundary in making and conveying an Artificial intelligence answer for extortion discovery and counteraction; practically speaking, no "one size fits all" ML calculation can be a panacea to every monetary misrepresentation. Identifying deceitful examples at scale can be extremely difficult due to the immense measure of verifiable as well as current information to explore, the intricacy of continually developing ML and DL procedures, deficient instances of really false ways of behaving, notwithstanding information security and protection issues in making sense of how a fake example was recognized. These make it exceptionally testing to make feasible ML misrepresentation discovery arrangements without undertaking definite detailed trials.

Cooperative examination attempted to lay out the essentials for combatting extortion with ML showed that quality informational collections, joining, consistent observing and trial and error with accessible ML preparing techniques and calculations are critical elements for progress. Notwithstanding, it likewise cautioned that there's a gamble of "white-boxing" to the adopters of such extortion frameworks concerning the logic of the ML frameworks constructed. While the utilization of ML in distinguishing monetary wrongdoing has gigantic advantages, the capacity to precisely identify dubious or terrible financial exercises while conveying the ideal nature of administration to clients comprises a colossal compromise and a fragile, challenging activity [27].

Another hindrance to Artificial Intelligence in finance is localization. FinTech, RegTech and InsurTech firms frequently need to make models useable inside different purviews and markets, which often have disparities in guardian guidelines, socioeconomics, dialects and general culture. Dealing with this challenge can have the following effects: administrative obstacles, deficiency of Artificial intelligence/ML informed authorities (e.g., information researchers, software engineers or designers) having area explicit information, lingual boundary inside specific locales and the unwavering quality of any created arrangements.

TABLE II. AI IN FINANCE – THREATS AND REMEDIES

<i>Threat/Risk/Challenge</i>	<i>Potential Mitigation</i>
<ul style="list-style-type: none"> • Accuracy • Consistency • Transparency/trust • Ethics • Legal • Governance • Shortage of Expertise • Localisation • ML design and build (MLDB) complexity e.g., integration. 	<ul style="list-style-type: none"> - Incorporate AI explainability in MLDB - Incorporate AI ethics in MLDB - Stakeholder collaboration - Ethico-socio-legal awareness - Safeguard mechanisms for data privacy - Robust governance frameworks - Human centric approach in MLDB - Progressive regulatory control - Continuous oversight and monitoring - MLOps (ML Operations) combined with DevOps (Development and Operations) for consistency and serviceability - White-boxing as opposed to black-boxing MLDB to minimise opacity - Risk identification, categorisation and containment - Extensive stress testing in MLDB

CONCLUSION

This paper has dug momentarily into Artificial Intelligence and ML, giving an unmistakable qualification between the two, close by a valuable verifiable foundation preceding complementing their applications in the FS business. Artificial Intelligence in finance is a complex idea. It is a mechanical reality that organizations, people, legislatures and the more extensive society need to plan for. Artificial Intelligence's change to the worldwide FS market will be phenomenal if and when it works precisely and dependably.

REFERENCES

1. IEEE Spectrum, "Artificial Intelligence Orchestrating Incremental \$250 Billion Revenue Shift," Markets and Markets, February 2022. [Online]. Available: <https://spectrum.ieee.org/u/marketsandmarkets>
2. SRI, "75 Years of Innovation: Siri, How Siri entered the world and gave computing a voice," SRI International, April 2020. [Online]. Available: <https://medium.com/dish/75-years-of-innovation-siri-75244a25c741>
3. PWC, "Sizing the prize, Global Artificial Intelligence Study: Exploiting the AI Revolution," World Economic Forum, Annual Meeting of the New Champions, Dalian, China, June 2017. [Online]. Available: <https://www.pwc.com/gx/en/issues/analytic>
4. R. R. Nair, "With machine learning, conservative financial industry shows its progressive side," MIT Technology Review Insights in association with Google, December 2018. [Online]. Available: <https://www.technologyreview.com/2018/12/21/103617/>
5. O. T. Eluwole, N. Udoh, M. Ojo, C. Okoro and A. J. Akinyoade, "From 1G to 5G, What Next?," IAENG International Journal of Computer Science, vol. 45, no.3, pp. 413-434, August 2018.
6. M. I. Jordan, "Artificial Intelligence - The Revolution Hasn't Happened Yet," Harvard Data Science Review, July 2019.
7. K. Pretz, "Stop Calling Everything AI, Machine-Learning Pioneer Says: Michael I. Jordan explains why today's artificial-intelligence systems aren't actually intelligent," IEEE Spectrum, September 2021.
8. A. M. Turing, "Computing Machinery and Intelligence," Mind 49, Volume LIX, Issue 236, pp. 433-460, October 1950.
9. R. Anyoha, "The History of Artificial Intelligence," SITN, Harvard University, The Graduate School of Arts and Sciences, August 2017. [Online]. Available: <https://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/>
10. A. L. Fradkov, "Early History of Machine Learning," IFAC-PapersOnLine, Volume 53, Issue 2, pp. 1385-1390, 2020.
11. Y. Le Cun, B. Boser, J. S. Denker, R. E. Howard, W. Hubbard, L. D. Jackel, D. s/assets/pwc-ai-analysis-sizing-the-prize-report.pdf

- Henderson, "Handwritten Digit Recognition with a Back-Propagation Network," *Advances in Neural Information Processing Systems 2*, pp 396-404, June 1990.
12. Project EDoN, "AI could help 'diagnose dementia in a day'," Cambridge University, Addenbrooke's Hospital and Alzheimer's Research UK, August 2021. [Online]. Available: AI could help 'diagnose dementia in a day' - Alzheimer's Research UK (alzheimersresearchuk.org)
 13. OECD, "Artificial Intelligence in Society," OECD Publishing, Paris, 2019. [Online]. Available: <https://doi.org/10.1787/eedfee77-en>
 14. V. N. Dornadula and S. Geetha, "Credit Card Fraud Detection using Machine Learning Algorithms," *Procedia Computer Science*, vol. 165, pp. 631-641, 2019.
 15. W. Hilal, S. A. Gadsden and J. Yawney, "Financial Fraud: A Review of Anomaly Detection Techniques and Recent Advances," *Expert Systems with Applications*, vol. 193, May 2022. Available online 31 December 2021, doi: <https://doi.org/10.1016/j.eswa.2021.116429>
 16. A. Shabbir, M. Shabir, A. R. Javed, C. Chakraborty, and M. Rizwan, "Suspicious transaction detection in banking cyber-physical systems," *Computers & Electrical Engineering*, vol. 97, January 2022.
 17. M. K. Severino and Y. Peng, "Machine learning algorithms for fraud prediction in property insurance: Empirical evidence using real-world microdata," *Machine Learning with Applications*, vol. 5, September 2021.
 18. H. Sarker, M. H. Furhad and R. Nowrozy, "AI-Driven Cybersecurity: An Overview, Security Intelligence Modeling and Research Directions," *SN Computer Science*, vol. 2, no. 173, March 2021.
 19. G. Press, "Equifax and SAS leverage AI and deep learning to improve consumer access to credit," *Forbes*, February 2017.
 20. N. Mehrabi, F. Morstatter, N. Saxena, K. Lerman and A. Galstyan, "A Survey on Bias and Fairness in Machine Learning," January 2022. [Online]. Available: <https://arxiv.org/pdf/1908.09635.pdf>
 21. C. Molnar, "Interpretable Machine Learning. A Guide for Making Black Box Models Explainable," Second Edition, January 2022. [Online]. Available: <https://christophm.github.io/interpretable-ml-book/>
 22. C. Molnar, G. Casalicchio and B. Bischl, "Interpretable Machine Learning – A Brief History, State-of-the-Art and Challenges. In: Koprinska I. et al. (eds)," *ECML PKDD 2020 Workshops. Communications in Computer and Information Science*, vol 1323, pp 417-431. Springer, Cham, 2020.
 23. House of Commons, "Robotics and Artificial Intelligence. Fifth Report of Session 2016–17," HC 145, October 2016. [Online]. Available: <https://publications.parliament.uk/pa/cm201617/cmselect/cmsctech/145/145.pdf>
 24. S. Meredith, "Facebook-Cambridge Analytica: A timeline of the data hijacking scandal," *CNBC Tech News*. April 2018. [Online]. Available: <https://www.cnbc.com/2018/04/10/faceboo>

- k-cambridge-analytica-a-timeline-of-the-data-hijacking-scandal.html
- Artificial Intelligence, and Communications Technology (IAICT)
25. P. Zialcita, "Facebook Pays \$643,000 Fine for Role in Cambridge Analytica Scandal," National Public Radio Technology News. October 2019. [Online]. Available: <https://www.npr.org/2019/10/30/774749376/>
 26. Information Commissioner's Office, "ICO issues provisional view to fine Clearview AI Inc over £17 million," ICO News and Events, November 2021. [Online]. Available: <https://ico.org.uk/about-the-ico/news-and-events/news-and-blogs/2021/11/>
 27. S. Bradley, "6 essentials for fighting fraud with machine learning," MIT Technology Review Insights in association with SAS, November 2019. [Online]. Available: <https://www.technologyreview.com/2019/11/18/131912/>
 28. OECD, "Artificial Intelligence, Machine Learning and Big Data in Finance: Opportunities, Challenges, and Implications for Policy Makers," OECD Publishing, 2021. [Online]. Available: <https://www.oecd.org/finance/financial-markets/Artificial-intelligence-machine-learning-big-data-in-finance.pdf>
 29. Y. Mudgal et al, "Artificial Intelligence Risk & Governance," Artificial Intelligence/Machine Learning (AI/ML) Risk and Security (AIRS), Wharton AI for Business, 2020. [Online]. Available: <https://www.airsgroup.ai/artificial-intelligence-governance> The 2022 IEEE International Conference on Industry 4.0,