



corporatecompliance.org

# Compliance & Ethics PROFESSIONAL®

A PUBLICATION OF THE SOCIETY OF CORPORATE COMPLIANCE AND ETHICS

SEPTEMBER 2018



## Meet Ibrahim Yeku, CCEP-I

Barrister & Solicitor  
Solola & Akpana  
Old GRA, Port Harcourt,  
Nigeria

by Cris Mattoon, JD, CCEP, CAMS, MCM

# Ethics and algorithms: Mitigating bias in deep machine learning

- » Organizations employ robotic process automation (RPA) and artificial intelligence (AI) solutions to reduce risk in a cost-effective, automated manner.
- » Repetitive, transaction-based tasks can be routinized using RPA, thus freeing up professional resources to perform higher-level analysis and institute qualitative improvements.
- » AI employs predictive mathematical algorithms to support logical decision-making, thus heightening objective outcomes.
- » Trusted AI systems are essential when performing and validating activities that rely upon decision-making among multiple logical alternatives.
- » AI must be infused with appropriate ethical context to improve transparency, strengthen internal controls, and provide greater assurance to stakeholders.

**Cris Mattoon** ([cqmattoon@aaamichigan.com](mailto:cqmattoon@aaamichigan.com)) is Assistant Vice President, Compliance & Ethics, for The Auto Club Group in Dearborn, MI.

Technology innovations continue to drive organizational efficiencies and improve the consumer experience. The media is awash in articles, interviews, and op-ed pieces attacking or defending the emergence and ascendancy of robotic process automation (RPA) and artificial intelligence (AI). RPA may be regarded as a qualified support mechanism—an assistant—that performs lower-value steps in a process, thus allowing humans to focus upon the higher-value analytical aspects of the process. Organizations are turning to AI systems to further realize efficiencies by employing algorithms to perform that analysis that supports effective decision-making.

## Deep machine learning

AI has been recognized across industries as an effective approach to human learning and reasoning. Machine learning, a subset of AI, has been applied to data mining to optimize decision-making in fields as diverse as medical research<sup>1</sup> to consumer marketing. Deep machine learning (DML) first appeared in 2006 as a new field of research within machine learning, and was initially referred to as “hierarchical learning.”<sup>2</sup>

DML involves both an abstract layer analysis and hierarchical methods applied to myriad real-life scenarios. Nonlinear processing in multiple layers employs an algorithm where the current layer takes the output of the previous layer as an input. Hierarchy is established among layers to organize the



Mattoon

importance of the data to be considered as useful or not. The algorithmic design, as well as the breadth or limitations of the chosen data set, lend themselves to inherent biases exhibited by the individuals who design and choose.

### Mitigating disparate impact

Limiting our discussion to the *unintended* consequences of subconscious human bias, I am making the assumption that an individual would not intentionally skew a machine learning algorithm or historical data inputs. To do so would by its very nature be both unprofessional and unethical.

Disparate impact results when a group of people are harmed by the application of an otherwise facially neutral decision-making process. Compliance officers commonly encounter the concept of disparate impact in the provision of consumer loans, mortgages,<sup>3</sup> housing,<sup>4</sup> employment,<sup>5</sup> and educational opportunity.<sup>6</sup> Although no intent to detrimentally treat people differently is manifested by the individuals making the decisions, the outcome impacts similarly situated individuals more or less favorably.

A common example of disparate impact would be a lending policy that restricts the granting of loans to \$50,000 or greater, thus discouraging lower-income borrowers seeking smaller loans from applying. Subsequent review by a loan review manager or an internal auditor might detect this pattern and recommend an adjustment to the loan policy.

Proponents of AI may be inclined to highlight the objectivity that DML introduces into a seemingly neutral decision-making process. But when human bias influences the data input selections, algorithmic functions, or results interpretation and application, DML can produce disparate impact.

The issue is compounded when the biased historical data that is fed into the algorithm results in additional layers of inputs that are then reintroduced into the data stream to further substantiate the future outputs. Using the prior lending policy example, if historical data that reflected the \$50,000 minimum were input into the algorithm by someone unfamiliar with the impact upon lower-income borrowers in a primarily racially or ethnically diverse community, then the DML process would serve to compound the discriminatory effect as subsequent loan approvals would become the new data being fed into the algorithm.

### Heightening trust through objectivity

Sponsors of AI projects, whether representing business line or data analytics teams, will certainly be seeking the most efficient time to delivery and launch. It is incumbent upon the chief ethics and compliance officer to insist that AI is subjected to the same degree of rigor to which any new project, product, or delivery channel must adhere.

Common themes emerge when applying ethical principles to AI and DML. Historical data set selections should be made and validated by multiple layers of individuals or teams that provide a check and balance to ensure inherent bias is minimized. Transparent algorithms should be well-documented, tested, and challenged by multiple layers of quality control to further minimize design bias. Results should be back-tested to validate the correlation between inputs and outcomes.

When real people's livelihoods and futures are subject to the increasing reliance upon efficient digital processes, it becomes that much more important to retain a holistic human perspective. A best practice is to

position a moderator to oversee and review the process, and that role is well-suited to a compliance officer. At any step during the validation process that fails to uphold the organization’s ethical principles of fairness, the compliance leader must pursue the issue further with the project sponsor to remediate the bias.

**Conclusion**

Artificial intelligence will continue revolutionize how organizations, employees, and consumers interact with one another. The evolution and application of DML provides great upside potential to automate lower-level data manipulation and drive algorithmic decision-making, thus freeing up professionals to focus upon the qualitative, high-touch aspects of human engagement. As with any

new application of technology to the employment and consumer realms, ethics and compliance professionals must ensure that appropriate transparency, internal controls, and stakeholder engagement remain active. At the end of the day, it’s about doing the right thing to protect employees, consumers, and the board. \*

1. Daniel Faggella: “7 Applications of Machine Learning in Pharma and Medicine” *Techemergence*; June 1, 2018. Available at <https://bit.ly/2gff8LM>.
2. Yoshua Bengio: “Learning deep architectures for AI” *Foundations and Trends in Machine Learning*, 2009;2(1):1–127.
3. Federal Deposit Insurance Corporation: “II. Concepts of Disparate Treatment and Disparate Impact,” *Managing Fair Lending Risk*. Available at <https://bit.ly/2NzOr0q>.
4. U.S. Department of Housing and Urban Development: “Office of General Counsel Guidance on Application of Fair Housing Act Standards to the Use of Criminal Records by Providers of Housing and Real Estate-Related Transactions” April 4, 2016. Available at <https://bit.ly/2ABavAz>.
5. U.S. Equal Employment Opportunity Commission: “Background Checks: What Employers Need to Know.” Available at <https://bit.ly/1thlcUK>.
6. U.S. Department of Education, Office for Civil Rights: “Dear Colleague Letter” October 1, 2014. Available at <https://bit.ly/2L1GoYN>.

SO YOU WANT TO BE **AN INVESTIGATOR?**

Or maybe you’ve just been *delegated* that duty, and you need to know how—ASAP...

**Help is at hand!**

**Investigative Interviewing**  
\$50 for members/\$60 for non-members

**Workplace Investigations**  
\$90 for members/\$100 for non-members

**The First Information is Almost Always Wrong**  
\$80 for members/\$90 non-members



**SAVE \$20** when you buy all 3 of Meric Bloch’s books together:  
**\$200 for members/\$230 for non-members**



Get them today at **corporatecompliance.org/books**

Published by the Society of Corporate Compliance and Ethics (SCCE)

Copyright © 2018 SCCE. All rights reserved.