

Topic 5: AI vs AI: Viewpoints

(AI is a double-edged technology, need to use it for greater good!)

Artificial Intelligence (AI) has become a buzzword in every industry that claims to provide an excellent product/service features to promote its sales and marketing. In many cases, justifications for using AI/ML are not very clear or their technical benefits are poorly understood. It may not be necessary to use AI/ML techniques for well-defined problems where exhaustive searches, look-up tables or some statistical measures may produce similar outcomes. There exists more than fifty so-called AI/ML algorithms and heuristics. It is very important to understand the complexity of data features, associated constraints, and proper data representation (encoding); also, there are other determining factors while choosing a specific AI/ML technique. As reported "*AI is not magic, it is computational logic*" indicated that mathematics and statistics are underlying building blocks of all AI/ML algorithms and require in-depth knowledge of techniques to efficiently solve different real-world problems. Moreover, if the environment is unpredictably dynamic, uncertain, misleading, and have man-made obfuscation where behavior profiling or knowledge patterns are difficult to harness, most AI/ML techniques in practice today may miserably fail.

In this talk, I will discuss some important use of AI in search, optimization, prediction and discovery; how algorithmic bias can impact decisions; how AI can play dual-role and can be applied in many ways with varying intent. I will also exhibit use cases on "Defensive AI and Offensive AI", and in designing "Digital Twin". Finally, I will argue that with the significant business benefits of using AI/ML techniques, there exist possibilities of misuse/abuse or inappropriate use of such techniques. So, regulations such as Algorithmic Accountability Act. become essential for AI-based developers to take responsibilities of their products and services.

References:

- *An Empirical Study on Algorithmic Bias*. S. Sen, D. Dasgupta and K. D. Gupta, 2020 IEEE 44th Annual Computers, Software, and Applications Conference (COMPSAC), pp. 1189-1194, Madrid, Spain, 2020.
- *AI vs. AI: Viewpoints*, D. Dasgupta, Technical Report, no. CS-19-001, The University of Memphis, May 2019.