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Theoretical Equations for the Study of Entropy of Emotions and Enhancing Performance of Artificial Intelligence

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Abstract. Artificial intelligence (AI) is used in every aspect of life nowadays. The current AI needs further improvisation to prevent its undue use or singularity, where the human being tends to lose control of its function. Hence, there is a need for ethical modelling of AI to prevent unregulated activities. The author proposes the addition of emotions or humanization to prevent this process of singularity. Mathematical equations were developed by the author heuristically in this study and solved using wolfram Mathematica, and the emotional movements can be regulated by modifying the parameters or their significance. Alternatively, these equations can be used by psychologists to study human behavior and predict entropy.

Keywords: Artificial intelligence, Emotions, Entropy, Mathematica, Markov's chain, Game theory

Introduction

There is an exponential increase in the use of artificial intelligence (AI), and this process can trigger technological singularity, which is impending in the near future.[1-3] One of the methods to control AI singularity is the introduction of emotions in the fifth dimension, which was proposed by the author.[4] Introducing emotions will give a natural basis for function or 'behaviour' and control by artificial intelligence.

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Main text

The study of the basic construction of human emotions is interesting and mathematical modeling will enable artificial intelligence programming to progress.[4] However, understanding and modeling at the fundamental level is complex. The process is modified by environmental, cultural, and psychosocial factors. However, the fundamental thinking and entropy are similar in various situations to considerable degrees. Hence, the author developed basic equations heuristically and solved them using wolfram Mathematica. The equations will be useful for studying the concept in-depth and develop in the future with modifications. As love is the commonest emotion, it was considered as x, and with reference to the individual, the level of attraction could be π^x, and in a celebrity could be e^x. Negative emotions associated with love or x can be classified as $x^{1/3}$ and $\sqrt{x}$. The degree and the ratio of the negative emotions could be different, and the quantum varies. Perturbations around the center (or around normalcy) are more interesting, large, and frequent than at the extremes. The equations can be studied in artificial intelligence using phantom or robotic models. Models like improvisations in M3GAN can be used to study the reactions. The current artificial intelligence has a basis in Markov's chain or ergodic theory principles, which function by the stochastic probability of events from previous events.[5-10] Hence, these equations presented could be used for understanding and programming the AI for better performance in the future. The equations (Eq) of entropy are self-explanatory, and the degree of positive or negative magnitude of the emotions will vary.

The artificial intelligence functions could be

AI functioning entropy = Equation of emotional entropy + Root cause analysis + Markov's chain + Game theory with closed loop perturbation

The equations are classified as basic, which were the fundamental equations (supplement 1), and the others include non-parametric entropy, parametric entropy (supplement 3),[11] and parametric angulations (supplement 4).[11] Non-parametric emotions can be like mother's love, parametric equations can be attractions or parametric love, and angulations could be deviations in usual thinking, like in various personality states – physiological or pathological states, including thought disorders.

The fullness or 'humanization' of AI performance can be achieved by the above equations. For example, decisions in conflict situations like war can be studied through the analysis of the equations—some other situations, like the performance of financial markets across the world, which is unpredictable though controllable. Markov's chain alone, based on past statistics, has limitations to be applied in every aspect since the circumstances would be complex, and entropy could change in the future.

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Game theory has its applications and limitations based on the type of game in the problems.[12-14] The commonly used game theories are dominant strategy, Nash equilibrium, backward induction, and cooperative game strategy. The cooperative theory is more realistic and common in its application.[15,16] The output has certain effects on the input, and the game has the potential to develop models of the closed-loop system. Hence, a combined resultant output could lead to a realistic performance or humanization of artificial intelligence. Closed loop perturbation is a localized process where the input depends on the outcome achieved. This is commonly used in closed-loop engineering systems, for example, in pacemakers involving cardiac resynchronization therapy.[17-19]

Root cause analysis is essential to identify the problems for troubleshooting or developing, solving, and setting the game.[20,21] The AI has to analyze the inciting factors, potential threats, etc., in the process. The combined processes with neural networking of each segment – identifying the equations, root cause analysis, Markov's chain, and the game theory with closed loop perturbation would give the best results, and the phenomenon of humanization of the AI is feasible.[22]

For example, the emotions in a capitalist financial market. The entropy of a small 'π' company of major one 'e' and the market correction methods depending on the approach of performance of the other companies – the game and the investors' psychology – the Markov's chain, and general market movement in any context – the root cause analysis. Based on the outcome, the respective graph can be traced back – a backward induction method, and the AI can predict the general entropic outcomes in the concerned 'algo' trading. Drugs like digoxin though useful in routine clinical practice, are not widely used though efficacious due to poor emotional attraction because of its low price. Similarly, very useful drugs like levosimenden which is at 'π^x' deliberation now and not yet approved by FDA, which needs to be at 'e^x' in the level of attraction to benefit from its clinical use in daily practice.

Conclusions

There are potentials for modelling of AI for identification and intervention of entropy of emotions. Further studies are required for tis applications in real worlds' systems.

Conflict of interests: None

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Supplements[11]

Supplements 1- Basic equations (Equations 1-23), Supplement 2- Non-parametric entropy (equations 1-11), Supplement 3 – Parametric entropy (equations 1-17), Supplement 4 – Parametric angulations (equations 1-29)

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