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Diagnostic Essay
How would You Feel about a computer grading your essays?

As computer algorithms and computers become increasingly advanced in their ability to mimic or approach human intelligence, algorithms **can arrive at the degree of sophistication awkwardly constructed!**required to assess the quality of writing and clarity of pieces of writing such as essays. However, explaining many of these advanced algorithms, a problem so complex that it has spurred a field called~~,~~ *Explainable Artificial~~Artifical~~ Intelligence*, remains a mystery due to the complex structure of these algorithms. clear introduction

Many of the most advanced algorithms that approach human understanding, a field known as *Natural Language Processing (NLP),* are built with structures called *neural networks*, sequences of units that perform mathematical calculations on inputs to produce an output. These units are arranged into layers that receive the outputs of previous layers, perform calculations on the received output and pass them as input to the next layer of the network this is pretty fascinating!. While the input and output are easily decipherable, the layers in between, called the *hidden layers*, which perform the majority of calculations produce outputs at each layer that are not easily decipherable. For example, in a network that is given an essay, the input (the essay) and the output (the grade) are easily known as the input and output of the network. However, the true value of the network, the steps involved in determining the grade, are a mystery to the essay writer, grader, and algorithm creator.

Moreover, the ability and efficacy of these algorithms are directly tied to the data used to *train* these algorithms I guess in that sense it is determined by the skill of the person in putting the data (Training is the process in which the specific calculations in

each unit are determined after many iterations of training on distinct input data). In this context, the algorithm's ability to generalize to more diverse essays would be completely dependent on the essays used to train the algorithm. The algorithm would learn to recognize a "good" essay as the amalgamation of characteristics in the input essays, leading the algorithm to reward essays that are the average of the input essays, stifling student/essay writer creativity and creating a groupthink culture that penalizes individuality and rewards conformity.

While these issues are characteristic of current algorithms, if we choose to ignore **current nuances and limitationsWhat are you referring to hear exactly?**, an algorithm that can grade a student's essay is still an ineffective teaching tool. If it is difficult to determine the reasoning behind an essay's specific grade, the algorithm itself cannot be an effective teaching tool for essay writers and students. While an empirical value given to an essay can provide some clarity to students and essay writers, it does not provide information about how an essay can be improved Very good point!. Students and essay writers are further lost when the algorithm not only provides a single empirical value for their essay but cannot report the metric against which their essay is graded.

We have already seen the shortcomings of these algorithms in far more serious matters. Artificial intelligence in medical situations carries the risks associated with providing a single empirical value (a disease diagnosis) with no reasoning and no chance of determining the metrics by which this result was achieved.

In a recent deployment of artificial intelligence in a medical scenario, the algorithms had to be built to split the diagnosis of an eye disease into specific tasks that

can inform doctors, “[the algorithm] gives several possible explanations, alongside its confidence in each one. It also shows how it has labeled the parts of the patient’s eye, giving doctors an opportunity to spot faulty analysis” (Vincent, 9). While splitting the task into understandable pieces makes artificial intelligence algorithms more explainable, the process of splitting this problem effectively and reasonably cannot be automated and would require a monumental effort.

These issues, however, are the current limitations and nuances of algorithms that are approaching a human understanding of language. We must imagine a truly omniscient algorithm that can determine what defines a good essay. However, if we permit the use of an algorithm that analyzes essays to assign an empirical value to them, we treat our essays and our stories as simple commodities I think you need to clarify what exactly are the implications of assignments being treated as commodities in order to make this point stronger; what do you think?. And, as Neil Gaiman explains, “without our stories we are incomplete”. By assigning a value to our essays and stories, we assign an empirical, biased value to ourselves that lets an ineffective algorithm rob us of our individuality and force us to conform. I found this a very intellectual argument that you presented and a times to be perfectly honest I felt like I was out of my depth in accessing certain aspects; nevertheless I do recognize that there are some points in the work that you really need to be careful that your terms are very clear and specific because they are open to all sorts of interpretation. This is a very interesting topic and clearly one that will be hot potato for many years to come. 85%

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