Probabilistic Algorithms

Ask the wrong questions and get the wrong answers. I just realized that I've reinvented the wheel, but with a slightly different tread pattern. Probabilistic control has been around since the 1900's in the form of hit and miss engines. https://www.youtube.com/watch?v=fYKxwno6QUY
It's also used in the most modern of technologies, artificial intelligence. If I read a technical article and the author talks about either AI being a black box or blaming climate change for something or other, I immediately stop reading. I don't have time for idiots.
The math behind AI is very well understood and although the math itself is very abstract, the basic concept is simple. Each "neuron" of an AI weighs parts of the input question against the facts that it knows and then applies the sum of the weights to a non-linearity to come up with a number. A simple summing of weights is not used because this doesn't allow the neuron to multiply. A non-linearity is required to give the neuron multiplication capability. https://towardsai.net/p/machine-learning/the-sigmoid-function-a-key-building-block-in-neural-networks
In more practical terms, it limits amount of rightness or wrongness about the neuron's decision so that it doesn't have undue influence on the final solution. Shouting your answer more loudly doesn't make the answer more correct.
Here's some other links discussing how probability theory is used in AI. https://www.youtube.com/watch?v=0aZmCCnZI9E, https://www.cs.toronto.edu/~urtasun/courses/CSC411_Fall16/tutorial1.pdf
Although some AIs uses sigmoid functions, other non linearities can be used depending on the application and things like feedback and memory are also used. The important thing is that some kind of non linearity is required.
In the hit and miss engine, the non-linearity is the closing or opening of a valve. A speed decision is made and then the valve is either completely opened or closed. This makes the control system very simple because the gain of the system drops to zero when the valve is in either state. This prevents oscillation as seen in linear systems when the gain is too high and there is a delay in the feedback loop.
An example is the governor in a diesel engine. https://www.youtube.com/watch?v=OiHb2L8ei8E If the diesel engine slows down because of increased loading, the governor will increase the fuel provided to the injector fuel pump. The engine is directly connected to the pump and as the engine speeds up, it will pump even more fuel to itself. If the governor is too slow to respond by reducing the fuel, the engine can continue to speed up until it finally destroys itself. https://www.youtube.com/watch?v=c3pxVqfBdpQ
If there is a non linearity in the system such as a maximum fuel flow limit, or automatic fuel cutoff, the engine will either hit a top speed and stay there or shutdown.
It's the same with my control algorithm. While an AI neuron weighs probabilities simultaneously and then applies a non linearity, my algorithm applies probabilities sequentially and then applies a non linearity to produce an output. The process is very similar and the technique has been known for well over 100 years.
I don't pretend to even slightly comprehend the mathematics, but I don't need to because I don't need to predict exactly how the algorithm will work. I only need to know how to implement it and know that the principles behind it are well proven. My implementation may not be the most optimal solution, but sufficient for my purposes. More importantly, I want to show others that this type of solution exists and can be applied to a very broad range of problems using cheap hardware and simple software.
I learned about the link between AI and probability a few years ago and there was a beautiful visualization of how the process worked. I just did a Google search for the paper and there's not only an explosion of visualizations, there's tons of software for creating the visualizations.
Here's one example. https://jalammar.github.io/visual-interactive-guide-basics-neural-networks/

This is why I consider anyone who smugly states that AI is a black box is an idiot because even a simple search will quickly demonstrate the principles behind it.
As for climate change, believing that taking the average of computer program models which ignore the laws of thermodynamics can somehow predict the future is the absolute pinnacle of stupidity. https://wattsupwiththat.com/2024/05/13/modeling-the-mysteries/
Monte Carlo simulations are used with models in designs, but these models use well proven laws and are used to check what happens when things like component values change in an electronic circuit. Extending the concept by ignoring natural laws and somehow hoping the sufficient randomness is going to magically solve a problem demonstrates a heroic level of ignorance.
Yes, probabilistic problem solving works as shown with AI, but it's not a substitute for ignorance and there must be mutual information which is being searched. In correctly made models, the mutual information is well established laws such as the laws of thermodynamics, the laws of electrodynamics, the laws of chemistry, etc.
The use of random processes doesn't create knowledge by itself, instead it is a method of searching a database where a clear path to the desired information is not known. It's like tossing dice to decide what to eat for lunch without knowing what's in the fridge. Just because the dice say roast beef doesn't mean that there's meat in the fridge.
Instead, it's like opening the fridge door and randomly grabbing whatever is on the shelf and then checking if it is edible or not. The contents of the fridge put hard constraints on what is available. You can't have roast beef for lunch if all that's in the fridge is half a dried lemon and a bottle of mayonnaise.
Compounding this by using curve fitting on past data or "backtracking" to "prove" that the model is correct is even more stupid. Given sufficient parameters, any curve can be fitted to any degree of precision which proves exactly nothing. https://en.wikipedia.org/wiki/Curve_fitting I see this used constantly in investing strategies. This used to really piss me off until I realized that I'm competing against the idiots using those strategies and the only reason I'm wealthy is because they are subsidizing me. It's like running away from a bear, I don't have to faster than the bear, only faster than the other guy running from the same bear.

Incidentally, I believe that the current AI technology is at the same state as electronics in the vacuum tube era. The electronic principles behind vacuum tube operation and a modern MOSFET transistor are essentially the same, but a vacuum tube requires huge amounts of power to do the same function that a MOSFET transistor can do with infinitesimally less power. Current AI technology uses huge amounts of power to do what our brains do with a tiny fraction of the power. The current technology is at local maximum and is definitely not the true solution.
Also, hard limits are starting to occur in AI training and going to bigger and bigger machines is not the solution. There is a very real risk of a 2000's type collapse happening both because of the exponential growth of AI companies and the rapidly decreasing return on investment.
There is also a limit to the data available for training and the quality of that data.
https://www.youtube.com/watch?v=NcH7fHtqGYM https://www.youtube.com/watch?v=pnqtyVKpRbA
https://www.nature.com/articles/s41598-022-15245-z
Vacuum tubes are still in use, but the technology is essentially at a dead end. AI still has a long way to go, but when dedicated nuclear plants are required to run a data center, the end is near. https://www.bbc.com/news/business-68238330
All it takes is for some bright spark to figure out the technology driving our brains and its game over. The billion dollar nuclear powered data centers will suddenly become useful only as cheap electric car chargers.