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Artificial intelligence (AI) is a transformative megatrend that has the potential to influence nearly all aspects of how we live and work globally in the years to come. While it is easy to get excited about AI's potential, we at WisdomTree are focusing more on what AI can provide in terms of solutions today.

Have you recently interacted with a call-center or website that utilizes a chatbot? Maybe your phone unlocks because it can recognize your face or your car is able to sense if something leaps out in front of it and applies the brakes before you do. These are a few real-world examples of areas where AI is already influencing our lives.

Unbeknownst to many is that the concept of AI has been around since the mid-1900s, when much of the groundwork for future research was laid and terminologies first coined. So if these technologies have such a long history, why are they just coming to life today? It comes down to the confluence of three distinct factors:

1) High-speed capability to transfer data, be it broadband, 4G or 5G.
2) The fact that Moore's law[1] has had many years to compound the processing power of semiconductors.
3) Storing data is so inexpensive that most people barely consider it when taking that next photo or video with their phones.

High-speed, low-cost results are crucial for the ubiquity of a given technology. In short, advancements in hardware and software have converged to yield unique synergies to enable these AI solutions.

What Is AI Today? Software & Semiconductors

While AI is not solely software, nor solely semiconductors, it is true that without software and semiconductors working together cleanly, what we know of today as AI would not be possible.

Software

Software could be described simply as lines of code, but it should be considered as a tool designed to solve a problem. One recent area of focus for AI has been drug discovery. Drug discovery-oriented software is utilizing AI with the explicit goal of helping an expert researcher achieve a solution faster—which may ultimately alleviate suffering or contribute to curing a disease.

> Natural language processing: Think back to your college years and how great it would have been to be instantly familiar with nearly all academic research ever written within a particular subject domain. For most humans, this is purely fantasy, but for today's software

Generative design: Frequently, the toughest part of a project is getting started. For a drug researcher, there could be billions of different possible molecule arrangements. For a computer, the given rules of chemistry can be programmed into an app or 'learned' by an algorithm, and arrays of solutions can be suggested within the given parameters set by the researcher. Instantly, the problem of the blank screen can be dealt with.

Drug discovery is not yet at a point where the software alone can instantly develop new drugs, but they can be used to augment the efforts of human experts, potentially allowing the research phase to be concluded faster. Augmenting the capabilities of strong human skills is a big theme in AI.

Semiconductors

If we learned anything about semiconductors in recent times, it is that not all chips are created equal. Some, frequently called microcontrollers, are not necessarily manufactured as state-of-the-art but vehicles cannot operate without them. Others are so advanced they are manufactured by lasers slicing into pieces of silicon with a level of precision that removes individual atoms.

The key to a rudimentary understanding of semiconductors is understanding their function—data collection, storage, transfer and computation—all necessities for AI. Going a step further to grasp their ultimate placement and purpose offers additional context for their role in the AI ecosystem.

At the edge: Within AI, the term 'edge' means that data is collected at a peripheral location and the AI model can be run right there without the need to send the data anywhere else. These chips are at times constrained by how much they can weigh, how hot they can get, how much power they can consume per unit time, etc. If a chip is in a drone that needs to navigate properly, it doesn't have unlimited capacity for cooling or power consumption, for example.

In the cloud: OpenAI put out its GPT3 language model—a model with 175 billion parameters. Training models of this size require immense monetary and computational resources, most likely within the cloud. These chips can be manufactured with a single thought in mind: maximum performance.

One must recognize that there is no 'good' or 'bad' or 'better' or 'worse'—there is always a function, and the direction of travel looks like more and more highly customized chips fit for individualized purposes—like how Apple started designing its own semiconductors for its products recently, bypassing the services of Intel.

The Unique WisdomTree Approach: Our Methodology

Many investors are already familiar with AI and have many options should they want to include this exposure in their portfolios. At WisdomTree, we aim to provide unique and differentiated options for exposures, in this case, to AI.

In reviewing other passive investment options, WisdomTree concluded two things:

Pure, rules-based approaches, like screening for number of patents or revenue based on certain business activities, may be too broad to focus on companies more precisely exposed to AI. It is also difficult to rank these criteria; are more AI patents better than less AI patents? Hard to say without knowing more about the company or the competitive advantage offered by a specific patent.

The WisdomTree Artificial Intelligence and Innovation Fund (WTAI)

To offer investors access to key areas of innovation in AI, WisdomTree created WTAI, which seeks to track the price and yield performance, before fees and expenses, of the WisdomTree Artificial Intelligence & Innovation Index. With diversified* exposure to what we believe to be the fastest growing and most exciting opportunities in the AI value chain, WTAI can be an option within a portfolio's growth allocation.