

HOW AI IS LEARNING FROM NATURE'S "SWARM INTELLIGENCE"

AI's 'deep thinking' could change investment management for the good.

Behavioral finance has proven that people often make financial decisions based on emotion and mood¹. Artificial intelligence algorithms can pick up these sentiment changes and capture large-scale trends by identifying patterns within massive datasets. (What we do within the BUZ US Sentiment Leaders ETF is just one example.)

Artificial Intelligence (AI) models can identify the market's opinion on a particular product, a stock, or the mood of traders. It can also be used to detect events like breaking news that move the markets as well as long-term trends, ideas, or cultural movements important for certain stocks.

Even a few years ago, it was impossible for investors to access insights from this vast dataset of online and non-traditional content. But thanks to advanced AI and natural language processing techniques we've gained a new information edge.

Collective intelligence: nature vs. human

In nature, schooling fish use collective intelligence to detect vibrations in the water around them. So do flocking birds that detect motions that move through the group. Humans don't have this natural ability to form a "swarm intelligence". We don't have the subtle physical connections that create tightly knit feedback-loops among group members.

But new research in artificial intelligence is being done to close the connectivity gap. A great example is Dr. Louis Rosenberg's work with artificial swarm intelligence based on honeybee activity. He found that how bee swarms make decisions provides proof of potential for decentralized parallelized intelligence.

Essentially, it proves the potential for a machine-based collective intelligence that humans can use a "brain of brains" in numerous ways—including financial market analysis.

That human touch

Humans are biased and have sensitivities, conscious and unconscious. AI algorithms don't have these same drawbacks. AI's 'deep thinking' eliminates sentiment decisions because it captures data differently than humans.

We think in linear patterns, whereas AI (much like a honeybee swarm) can access wider intelligence captured in nonlinear patterns. Apply this to portfolio construction and risk management and you have the building blocks necessary for an AI generated investment portfolio.

Some see the problem with AI is that it humans can't fully deconstruct the logic behind its recommendations. Perhaps, but that's another topic for another post.

Artificial Intelligence takes cues from our environment

Nature provides plenty of examples of efficiencies gained through deep physical connections:

- **Schools of Fish / Flocks of Birds** – Natural instincts provide for better defence against predators, enhanced foraging success and higher efficacy in finding a mate.
- **Honeybees Activity** – Honeybee swarms typically pick the location that best meets the colonies needs in terms of food storage, size and rearing brood capabilities

Artificial Intelligence techniques (much like a honeybee swarm) can access and benefit from the wider intelligence hidden within nonlinear patterns.

IMPORTANT DISCLOSURES & DEFINITIONS

An investor should consider the investment objectives, risks, charges and expenses carefully before investing. To obtain a prospectus, which contain this and other information please contact your financial professional or call 1.855.215.1425. Read the prospectus carefully before investing.

Buzz US Sentiment Leaders ETF shares are not individually redeemable. Investors buy and sell shares of the Buzz US Sentiment Leaders ETF on a secondary market. Only market makers or “authorized participants” may trade directly with the Fund, typically in blocks of 50,000 shares.

The ability to invest based on artificial intelligence is relatively new and untested. The Fund may invest a significant portion of its assets in securities issued by companies in the information technology sector in order to track the Underlying index's allocation to that sector.

These types of funds typically have a high portfolio turnover that could increase transaction costs and cause short-term capital gains to be realized.

The Fund is not suitable for all investors. There are risks involved with investing in ETFs including the loss of money. The Fund is considered non-diversified and can invest a greater portion of assets in securities of individual issuers than a diversified fund. As a result, changes in the market value of a single investment could cause greater fluctuations in share price than would occur in a diversified fund. Funds that emphasize investment in small/mid cap companies will generally experience greater price volatility. Diversification does not eliminate the risk of experiencing investment losses. ETFs are considered to have continuous liquidity because they allow for an individual to trade throughout the day.

Investing in companies based on artificial intelligence analytics involves the potential for market manipulation because online posts may be made with an intent to inflate, or otherwise manipulate, the public perception of a stock or other investment.

Text and sentiment analysis of online postings may prove inaccurate; that is, high positive sentiment may not correlate with positive change in the value of a company's stock.

Natural language processing (NLP) deals with the application of computational models to text or speech data. NLP algorithms can be used in Sentiment analysis to identify and extract subjective information in source materials. Sentiment analysis is widely applied to reviews and other online content for a variety of applications, ranging from marketing to customer service.

Artificial intelligence (AI) is the intelligence exhibited by machines or software. One of the central problems (or goals) of AI research include natural language processing (communication).

Big Data is a term for data sets that are so large or complex that traditional data processing applications are inadequate.

Online platforms, as it relates to the ETF, refers to social media, news articles and blog posts.

Some examples of social media sites may include, but are not limited to, the following: Facebook, Twitter, LinkedIn, StockTwits, blogs, Investopedia, stock forums, etc.

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