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PALOS

Weekly Commentary

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Artificial Intelligence: Exponential Increases in Computing Power

Last week we attended the Nvidia GTC Developer Conference which included a keynote address from Nvidia Founder and CEO Jensen Huang. During the Tuesday session, we gained insight into how "accelerated computing" is fuelling advances in artificial intelligence (AI), drastically changing the world we live in. Accelerated computing demands that software developers have access to more efficient systems, networks, and data libraries. This will require manufacturers to build chips that are better, faster, and cheaper.

According to Huang, a combination of improved speed and scale has enabled us to achieve a "million x" for many applications over the last decade. For this to continue, massive amounts of capital investment and cloud computing capability will be required for developers to succeed. Huang foresees an accelerated "computing virtuous cycle" that will enable developers to substantially expand the number of AI applications and data bases at their disposal. This has catalysed the scaleup of research, invention, and adoption. In the words of Mr. Huang, generative AI has become the "iPhone moment "of AI.

Nvidia's ***Grace CPU Super Chip*** was unveiled last week. The high-performance unit, which measures a mere 5" x 8", is used to increase scale and speed efficiency of date centers. The low-power, air-cooled superchip can deliver one terabyte per second, two-and-a-half times the speed and consuming one-eighth of the power of existing technology. Grace is ideally designed for modern AI supercomputing and cloud data centers that seek accelerated workload capacity and reduced power consumption which ultimately improves efficiencies and hence, revenues.

Nvidia announced that ***BluField-3***, a proprietary data processing unit (DPU) that optimizes a datacenter's efficiency, is being used by over two dozen companies like Cisco, Palo Alto Networks and Red Hat. Data center accelerator technology allows users to used run their software platforms more efficiently. DGX AI Supercomputers, which Huang refers to as the "modern AI factory", are being adopted by companies like Microsoft Azure, Oracle Cloud and Tencent Games. GDX supercomputing is the "engine" behind ChatGPT, the breakthrough technology that can transform text, perform tasks, generate images, generate written material, and translate virtually any language.

Nvidia generative AI will be offered through ***Nvidia AI Foundations*** which include ***NEMO, PICASSO*** and ***BIONEMO***. Partnering with Adobe, Shutterstock, and Getty Images, PICASSO customers can use rights- protected models to create "next generation" proprietary written and visual content. BIONEMO will help researchers with all facets of the new drug discovery process. On demand cloud access will allow researchers to use a library of DNA building blocks to

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develop new technologies that are designed to model and detect health threats. In tandem, biologists can project how diseases progress and develop a cure before it evolves. Imagine having the capability to detect and prevent a pandemic before it spreads.

Genomics, which focuses on studying the DNA of organisms, enables scientists to identify and characterize an organism's genetic sequencing. Accelerated computing has helped to transform the diagnostics and medical instruments industries. Imagine doctors having the ability to conduct bloodwork, access genomic sequencing and diagnosing an illness in a single visit. Working with medical device companies like **Medtronic (MDT:NYSE)**, common software platforms and Nvidia technology will assist with disease detection and robotic assisted surgeries at a significantly reduced cost.

Computational Lithography, in simple terms, uses complex algorithmic models to optimize methods used in the manufacturing of integrated circuits. As technology improves and electronic devices get smaller, the patterns that comprise silicon wafers must be optimized. Nvidia unveiled a "library" called ***cuLitho***, a revolutionary breakthrough whereby algorithms can improve resolution and speed up the manufacturing process. The result: faster, cheaper, and more accurate production capabilities with a lower carbon footprint. Companies like **Taiwan Semiconductor (TSM:NASDAQ), ASML (ASML:NASDAQ)** and **Synopsis (SNPS:NASDAQ)** have adopted cuLitho into their chip manufacturing.

Nvidia ***Omniverse Cloud***, which has been downloaded by almost 300,000 creators and designers, has partnered with **Microsoft (MSFT:NASDAQ)** to create an ecosystem that will help commercial enterprises to adopt AI in their day-to-day operations. Available later this year, the "network of networks" will be hosted on Microsoft Azure. The platform will grant users secure access to a full suite of software applications. For instance, users could use AI to create new products, design robotics-based assembling facilities (called "twin factories"), improve logistics efficiencies (e.g., Amazon, FedEx and UPS), and to optimize supply chains, customer-service, and dispatches by utilities companies. The benefits are virtually limitless.

Nvidia DGX Cloud, which has partnered with Microsoft Azure, Google Cloud and Oracle Cloud, will provide any customer with instant browser access to DGX supercomputing. This access offers companies access the world's best "end-to-end" suite of AI capability including Chat GPT, which can generate user-directed text, creative material and translate virtually any language. DGX GPU's have been adopted by more than half of the companies on the Fortune 500.

We've only seen the tip of the iceberg and in our view, the rapid acceleration of AI will change the world we live in. Investing opportunities will abound accordingly and as usual, we'll be doing our homework.

Disclosure: The Palos-Mitchell Alpha Fund holds shares of GOOG, MSFT, MDT and NVDA.

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Chart 1: Palos Domestic Funds versus Benchmarks (Total Returns) [1]	FundServ	NAVPS	YTD Returns
Palos Income Fund L.P.	PAL100	$8.41	1.96%
Palos Equity Income Fund - RRSP	PAL101	$6.59	1.29%
Palos WP Growth Fund - RRSP	PAL213	$12.61	1.06%
Palos-Mitchell Alpha Fund [3]	PAL300	$8.95	12.37%
S&P TSX Composite (Total Return with dividends reinvested)			1.32%
S&P 500 (Total Return with dividends reinvested)			3.85%
S&P TSX Venture (Total Return with dividends reinvested)			7.32%
Chart 2: Market Data [1]			**Value**
US Government 10-Year			3.38%
Canadian Government 10-Year			2.75%
Crude Oil Spot			US $69.26
Gold Spot			US $1,983.80
US Gov't10-Year/Moody BAA Corp. Spread			221 bps
USD/CAD Exchange Rate Spot			US $0.7276

[1] *Period ending March 24th, 2023. Data extracted from Bloomberg*

[2] *Fund is priced annually*

[3] *Fund is priced weekly on Tuesdays*

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