THE INVESTOR'S GUIDE TO:

COMPUTING, PROCESSING & AI

Understanding the robotics & artificial intelligence landscape from an investment perspective
It wasn’t long ago that artificial intelligence was considered a futuristic pipe dream. Novels, films, and television shows have been serving up images of an AI-driven world for decades. Fiction authors painted pictures of a world in which those who controlled technology and AI controlled the world. We never could have imagined how accurate these visions would become—or how quickly the concept of ‘technology as power’ would become our own reality.

For investors, this transition presents an incredible opportunity. The companies that are driving AI innovations today are on an undeniable upward trajectory. At the same time, the stock market has a long history of under-appreciating the scale of opportunity enjoyed by leading providers of new technologies at this phase of development. For investors hoping to profit from this expansion, the biggest takeaway is this: AI is not coming—it’s here.
The Computing & AI market is expected to reach $106 BILLION BY 2025. That’s a CAGR of 45% over the next six years.

WHY NOW?

AI is driving similar transformations in myriad industries, and new developments are just around the corner. Soon to come:

**Robotic Process Automation**
AI applications for manufacturing that don’t just automate tasks, but that enable entirely new business processes—such as single-use product configurations—that, in the past, were cost prohibitive.

**Next-Gen Factory Communications**
Machine vision and deep learning algorithms that make factory robots more adaptive, teachable, and better able to interact with humans.

**Complex Machine Vision**
Next-generation machine vision technology that empowers robots to make sense of the images they see.

**Revolutionary Motion Sensing**
Motion sensors equipped with deep learning technology that give robots the ability to inspect and extract anomalies, and to know when to stop what they are doing if there is a potential obstruction.
Since 2009, our world has been fully transformed by Big Data. And the winning combination of Big Data and AI is the key to turning the masses of information available today into meaningful—and powerful—insights. AI makes it possible to identify and analyze patterns within data, and to exponentially elevate and accelerate decision-making processes.

The result: a new wave of AI-driven innovations that are adding value in nearly every aspect of our lives. These spectacular new approaches to decision-making would not be possible without the use of AI and the core technologies that are driving faster, more effective memory processing, communication, and interactions.

ROBO Global Strategic Advisory Insight:

“For some, investing in artificial intelligence feels like banking on the unknown. The concepts behind AI can range from sounding futuristic to downright fictional. And yet, when you break down AI and explore the core technologies that drive it, look at what they are delivering today, and then consider what they are capable of delivering tomorrow, it’s suddenly quite easy to grasp how AI is changing the world around us.

It is these facts that make investing in AI a not-to-be-missed investment opportunity.”

-Henrik Christensen, PhD, ROBO Global Strategic Advisor
THE HUMAN FACTOR

AI technologies are already at work today to enhance the capabilities of humans. Smart machines now work side-by-side with smart people to accelerate processes, reduce costs, and enable previously unimaginable innovations. Here is just a few ways AI is being applied to augment the human workforce today:

**Blue Prism** offers a digital workforce that uses robotic process automation (RPA) capabilities to provide powerful AI and cognitive services. As AI-based assistants tackle basic customer inquiries, employees are free to focus on more complex tasks.

**Nuance** empowers physicians with computer-assisted documentation software that uses AI to provide real-time patient information and documentation details. These solutions ensure proper reimbursement processes, support compliance with regulatory requirements, and help improve quality outcomes.

**Amazon Robotics** has changed the face of retail with its fleet of more than 100,000 AI-enabled robots that pick items for customer orders in its fulfillment centers worldwide. Working side-by-side with human workers, the robots accelerate the fulfillment process to enable faster delivery to the customer.

**Autodesk** offers solutions that compare scans with 3D intelligent models to track and solve manufacturing issues in real-time. This level of predictive design and manufacturing maintenance saves precious time, reduces costs, and allows workers to focus on completing mission-critical tasks.
Growth in computing and AI has already proven spectacular. Since the inception of the ROBO Global Robotics & Automation Index in August 2013, the Computing, AI & Processing subsector has had a total return of 102%* as of Q1 2019.

In the universe of companies focused on the development and delivery of AI solutions, many are still private—a consistent scenario for companies that specialize in emerging technologies. Today, there are currently just 18 publicly traded companies in 5 countries that meet the ROBO Global AI criteria.

That number is certain to increase dramatically as demand for AI technologies, software, and solutions continues to expand. Some indicators of what’s to come:

Microsoft made 5 AI acquisitions in 2018 alone, and Apple, Intel, and Oracle also made key acquisitions last year. As AI technologies advance, so will the magnitude of opportunities for investors.
In the past 5 years, chipmaker Xilinx has been investing aggressively in its platform strategy and experiencing positive momentum. As a result, the company has delivered 9 consecutive quarters of accelerating sales growth. A leader in the FPGA market, Xilinx has industry-leading margins, strong design wins with cloud providers, and a large share gain opportunity from other chip makers. Their solutions are both vital to providing the heavy computing power needed for the AI-driven processes that are in such high demand by industries and consumers, such as cloud computing, genomic analysis, video processing, data storage, and network acceleration.

Xilinx is also investing heavily in its AI ecosystem and building out its datacenter software stack. The company’s core value proposition is to be a key enabler for cloud providers, providing the technology they need to optimize their existing infrastructures and apply their technology spend more effectively. Xilinx’s flexible architecture has attracted many of today’s largest cloud providers, including Amazon, which is powering its Amazon Web Services (AWS) environment with the Xilinx solution set. With growth deriving from multiple vectors, we don’t anticipate Xilinx seeing slowdown anytime soon.
SMART INVESTORS TURN TO ARTIFICIAL INTELLIGENCE COMPANIES

For investors, the most important thing is to keep an eye on the end goal. The obvious misstep is focusing on short-term trends and attempting to time the market. AI is no exception. 5G networks and quantum computers will be a reality within 18 months. 6G will be next in line, and with it we will see the next wave of AI deliverables.

- Fully autonomous vehicles to make our roads safer and more efficient.
- Cybersecurity tools to protect against identity theft and terrorism.
- Better, cheaper healthcare.
- Near-real-time drone deliveries.
- Precision farming to increase food production and reduce waste.

Each of these innovations will help make the world a better place. And each of these innovations will create new opportunities for investors. The global hunger for data and the AI that makes it meaningful is escalating rapidly. That pace will only continue to accelerate as innovations in machine learning, deep learning, data analytics, and other AI drivers continue to evolve.

For investors with an eye to future growth, now is the perfect time to start investing in AI—and prepare to reap the rewards.

About ROBO Global:

ROBO Global is the creator of the ROBO Global Robotics & Automation Index series, which provides comprehensive, transparent, and diversified benchmarks representing the value chain of robotics, automation, and artificial intelligence.

With the expertise of our leadership team and strategic advisors from the industry, we help investors capture the growth and return opportunities presented by this megatrend across industries, from healthcare to industrials to consumer products. Our indices are used by a variety of investment vehicles listed on multiple exchanges around the world. All rights reserved © 2019 ROBO Global.