

Optical Artificial Intelligence Accelerator Market is Forecasted to Reach a Value of US \$3.1 Billion by 2029

The Business Research Company's Optical Artificial Intelligence Accelerator Global Market Report 2025 – Market Size, Trends, And Forecast 2025-2034

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/EINPresswire.com/ -- What Is The Expected Cagr For The [Optical Artificial Intelligence Accelerator Market Through 2025?](#)

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The market size of the optical artificial intelligence accelerator has experienced significant growth in the past few years. It's projected to expand from \$1.03 billion in 2024 to \$1.29 billion in 2025, with a compound annual growth rate (CAGR) of 25.0%. This growth seen in the historical

period can be attributed to several factors. These include the escalating complexity of machine learning and deep learning models, an increasing demand for real-time AI inference and low-latency processing, a growing preference for autonomous systems and robotics, an intensified focus on scalable AI hardware solutions, and expanded adoption of AI in sectors such as healthcare and life sciences.

Expectations for the optical artificial intelligence accelerator market foresee a considerable size increase in

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the subsequent years. By 2029, it is anticipated to reach a value of \$3.11 billion with a compound annual growth rate (CAGR) of 24.6%. The estimated growth during the forecast period is linked to the escalating acceptance of AI-based applications in a variety of industries, the growing need for swift data computation and processing, the rising requirement for energy-efficient AI accelerators, increased funding in the research and development of optical computing, and the expanding use of AI in data centers and cloud computing. Anticipated trends for the forecast period include innovation in photonic computing for AI acceleration, high-speed optical interconnects advancements, the fusion of optical components with standard AI hardware,

technological enhancements in energy-efficient AI processing and evolutionary strides in optical neural networks for deep learning.

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What Are The Driving Factors Impacting The Optical Artificial Intelligence Accelerator Market?

The escalation of digital transformation is anticipated to fuel the expansion of the optical artificial intelligence accelerator market in the coming years. Here, digital transformation represents the merging of digital technologies into every aspect of a company to ameliorate operations, elevate consumer experiences, and stimulate innovation. The escalating need for improved customer experiences has led to an increase in digital transformation as companies adopt digital tools to provide swift, customised, and more accessible services, thereby meeting the changing consumer requirements. Optical artificial intelligence (AI) accelerators assist in the progression of digital transformation by empowering ultra-speedy, energy-efficient AI computations. This permits businesses to process extensive data sets in real time, fine-tune operations, and boost intelligent decision-making across products and services. For example, a survey by the European Investment Bank, a bank based in Luxembourg, revealed that in May 2024, only 30% of microenterprises in the European Union had taken steps to boost digitalization in 2022 compared to 63% large companies. Thus, the escalating digital transformation is propelling the expansion of the optical artificial intelligence accelerator market.

Which Players Dominate The Optical Artificial Intelligence Accelerator Industry Landscape?

Major players in the Optical Artificial Intelligence Accelerator Global Market Report 2025 include:

- Microsoft Corporation
- Huawei Technologies Co. Ltd.
- IBM Corporation
- Intel Corporation
- Broadcom
- STMicroelectronics N.V.
- Marvell Technology Inc.
- Synopsys Inc.
- Lightmatter Inc.
- Q.ANT

What Are The Main Trends, Positively Impacting The Growth Of Optical Artificial Intelligence Accelerator Market?

Major companies in the optical artificial intelligence accelerator market are prioritizing the development of inventive solutions like universal chiplet interconnect express (UCIe) optical chiplets. These are aimed to facilitate faster data transmission, enhance energy efficiency, and boost AI computing capabilities. The UCIe optical chiplet operates as a modular optical

interconnect unit that allows speedy, low-delay communication among disparate chiplets in a multi-chip AI accelerator system, thereby increasing data bandwidth and energy efficiency. For example, in March 2025, Ayar Labs Inc., a semiconductor company based in the US, introduced TeraPHY. This product, tailored for AI scale-up structures, provides ultra-high bandwidth (8 Tbps) at remarkably low latency and power usage, surpassing the constraints of conventional electrical interconnects. It permits smooth, scalable communication over various distances between GPUs and accelerators, establishing effective large AI computing networks. TeraPHY upholds multi-vendor compatibility through the UCle standard, encouraging an open environment for economical, high-performance AI systems.

Global Optical Artificial Intelligence Accelerator Market Segmentation By Type, Application, And Region

The optical artificial intelligence accelerator market covered in this report is segmented as

- 1) By Component Type: Hardware, Software, Services
- 2) By Technology Type: Silicon Photonics, Photonic Integrated Circuits, Free-Space Optics, Other Technologies
- 3) By Application: Data Centers, Edge Computing, High-Performance Computing, Telecommunications, Autonomous Vehicles, Healthcare, Other Applications
- 4) By End-User: Information Technology And Telecommunications, Automotive, Healthcare, Banking, Financial Services And Insurance, Manufacturing, Other End Users

Subsegments:

- 1) By Hardware: Optical Chips, Photonic Integrated Circuits (PICs), Optical Interconnects
- 2) By Software: Optimization And Compiler Tools, Simulation And Modeling Software, Deployment And Runtime Software
- 3) By Services: Consulting And Integration Services, Training And Support Services, Managed Services

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Which Region Holds The Largest Market Share In The Optical Artificial Intelligence Accelerator Market?

For the year specified in the Optical Artificial Intelligence Accelerator Global Market Report 2025, North America held the highest market share. However, it is Asia-Pacific that is predicted to exhibit the most rapid growth during the forecast period. The report consists of detailed analysis of different regions which includes Asia-Pacific, Western Europe, Eastern Europe, North America, South America, the Middle East, and Africa.

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