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Research Article

The New Innovative Methodology to Produce Quantum Chips: Using Optical Multi-Lens of Fiber, as a New Innovative Technique to Produce Next-Generation Computer Chips (Quantum Computer Chips)

Lie Chun Pong

MEd, CUHK (Chinese University of Hong Kong), MSc, HKUST (Hong Kong University of Science and Technology)
Email: vincentcplie@yahoo.com.hk

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Abstract
As semiconductor device dimensions approach their fundamental physical scaling limits, this research article pursuit of innovative technological solutions which imperative to sustain and enhance performance metrics. In this context, we suggested an innovative proposed strategy in utilizing (leveraging) multi-layer optical fiber architectures for sophisticated photonic integration directly onto semiconductor chips. This research paper explores the multifaceted potential of multi-layer optical fibers-not only serving traditional functions such as information transmission and data communication but also acting as integral components in the fabrication of quantum computing chips. By employing advanced optical lenses of interconnection and optimized lenses in multi-fiber waveguide coupling mechanisms, this innovative approach aims to significantly enhance the computational performance, energy efficiency, and scalability of integrated photonic systems, ultimately fostering the development of next-generation high-performance quantum computing technologies. This research article can shed light on the complex problem of the design and manufacturing of computer chips, especially for quantum computer chips. Since quantum computers can only operate at extremely low temperatures, around -150 degrees Celsius, they are not practical for normal temperature usage. This research article revolutionizes the traditional approach by utilizing multi-layer fiber to enhance the performance and efficiency of quantum computer chips, through a multi-layer fiber that can simultaneously interconnect zeros and ones calculations. The guiding approach can solve the existing problems of quantum computers.
Keywords: Multi-Lens, Multi-Lens of Fiber, Quantum Chips, Multi-Layer Lens Fiber.

Introduction

Traditional electronic connections inside and between computer chips are increasingly limiting in speed, latency, power use, and hit the technological barrier. To address these challenges, this research paper suggested an innovative solution (method concept), in utilizing the multi-layer optical fibers to solve the problem of quantum calculation (the commonality from 0 to 1), as u may all know, fibers have the famous characteristics for their high bandwidth and minimal signal loss in telecommunications, this feature can be corporate fusion into chip architectures. In addition to improving data transfer, our innovative methodology has demonstrated methods for physically and functionally integrating optical fibers with chip-based nano-waveguides, making it possible to produce a quantum computer with exceptional optical coupling commonality.

Physical miniaturization of semiconductor devices is nearing fundamental physical constraints; therefore, this research paper presents innovative interconnect and integration strategies in order to increase the criticality and sustainability of the trajectory of performance of chip enhancement, especially for quantum chips. One innovative promising avenue involves the utilization of optical fiber technology to facilitate advanced photonic integration directly at the chip level. This innovative approach leverages the unique advantages of muti-layer optical fibers, including low latency, high bandwidth, and immunity to electromagnetic interference, to transform current interconnection paradigms, particularly in the 0 to 1 commonality.

Discussion and Insight

This paper explores the potential roles of multi-layer optical fibers beyond conventional data transmission, considering their integration as core components within the chip fabrication process. The goal is to significantly improve the routine enactment in parallel metrics calculation, operational efficiency, and scalability of next-generation quantum computing chips through the implementation of enhanced optical interconnect architectures and wave-guide efficiencies, thereby paving the way for more capable and energy-efficient photonic-fiber-electro-fiber-electronic integrated computer chips dynamically.

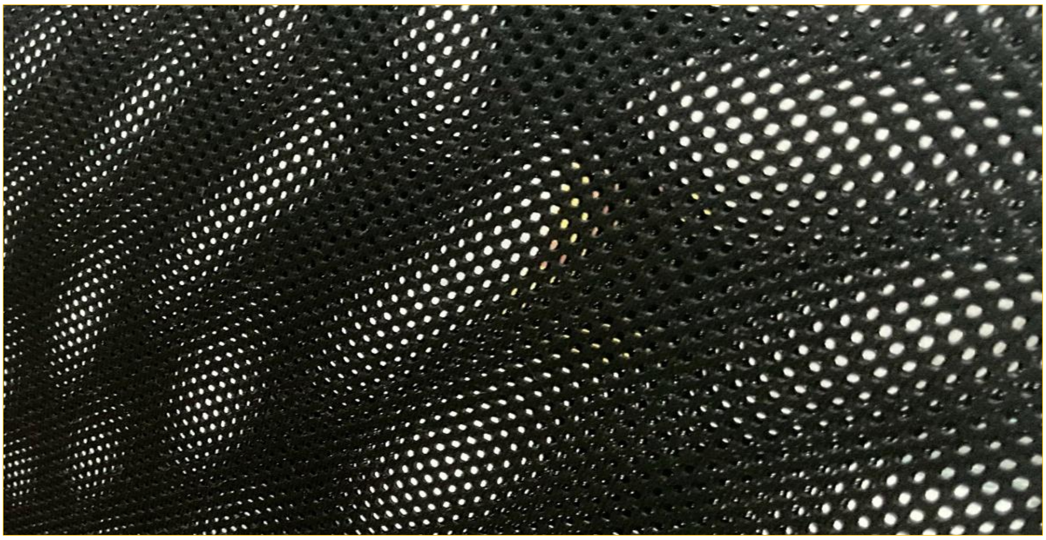

Figure 1. Dual equivalence (wave-like particle with ball properties that allow light posit in dual situation [Author's innovative view].

In the quantum physics properties, there is a dual equivalence, in the wave-like ball. The ball-like wave behavior, light bending, is a kind of style in a way to operate, although light will usually run into the shortest distance of the path length. So, when the light being bend with the curvature, actually, the light will run down into the wavelength of wight-length light that is bending in the curvature. That means no matter what happen it will run alongside the pavement (curvature); this characteristic can let the light bend happen. These properties have already been proven in (Kao and Hockham, 1966) and are being used in our telecommunication industry. Our research paper innovative idea is that, in promote the grid into muti-layer of parallel side fiber, so that the light can be go through simultaneously in each together. In other words, the light bending system, in the curvature, can be applied to the texture of the computer chips, which allows the simultaneous commonalities 0 and 1 feature. That is integrate into properties from zero to one, making the quantum computer chips possible. This innovative method, can allow chips in superposition. That is, 0 and 1 is alongside with each other. Provide 0 to 1 simultaneous commonality in superposition.

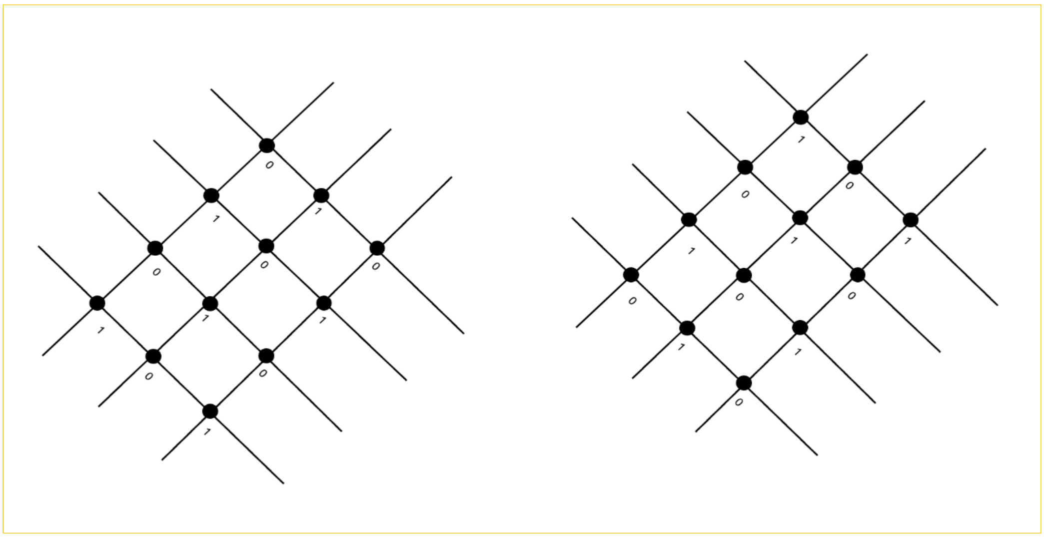

Figure 2. Integrate into properties from zero to one, making the quantum computer chips in a possible pathway [Author's innovative view].

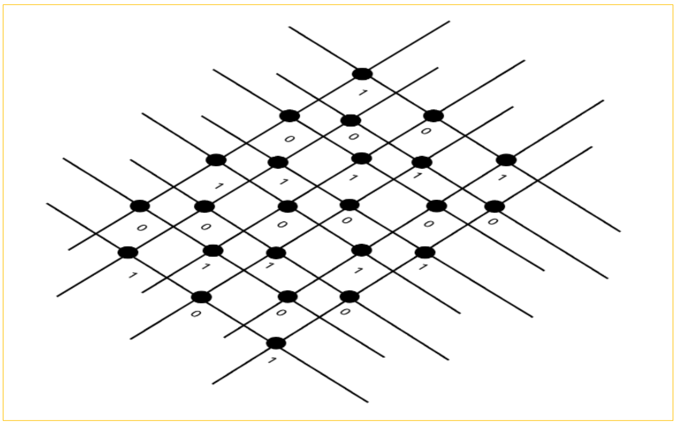

Figure 3. Simultaneous commonality in superposition state (1,0) [multi-layer fiber] [Author's innovative view].

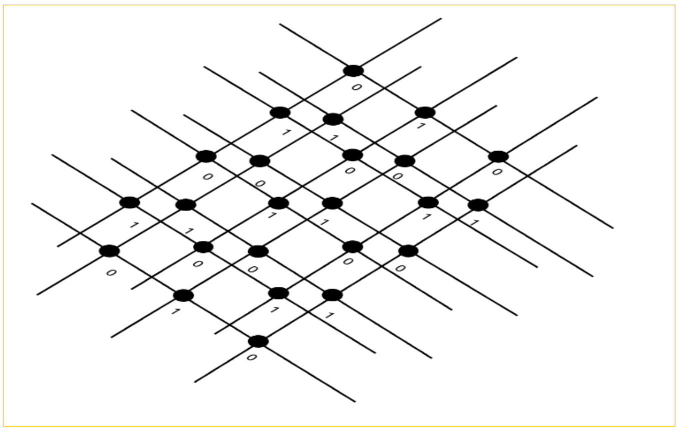

Figure 4. Simultaneous commonality in superposition state (0,1) [multi-layer fiber] [Author's innovative view].

As semiconductor size limits are reached, new methods are needed to maintain performance. This research paper suggests an innovative approach using multi-layer optical fiber technology for photonic integration on chips, which can promisingly accomplish the superposition behavior.

This innovative approach explores optical fibers for data transmission and chip fabrication, aiming to improve the performance, efficiency, and scalability of computing chips through better optical interconnects and waveguide efficiency.

So, this research paper suggested an innovative method, multi-layer lens fiber technology with semiconductor integration, this approach is to utilize the properties of the fiber that can succeed in the processor rundown, so this fusion suggestion, is to integrate both chips properties as well as fiber properties, when we use fiber muti layer application, we can utilized the lens of the fiber chips, this may turn the quantum computer chips possible happen.

Our innovative multi-layered optical parallel fiber chip structures made of glass or silica materials serve as highly efficient waveguides capable of transmitting light signals with minimal attenuation.

Advanced fabrication techniques have greatly mitigated the traditional confronts of connecting optical fibers to on-chip nanowaveguides, such as size matches, mode field, and transmission. This longstanding issue was address by Kao and Hockham in 1966. So, Kao and Hockham (1966) research can provide a strong supportive measurement into the computer application, our innovative assumption method approach, which makes the possibility happen in producing the quantum computer, the innovative multi-layer fiber method, can make the 0 and 1 happen simultaneously in superposition.

For instance, the implementation of oxide taper structures, meticulously fabricated over the termini of nano-waveguides on integrated chips, combined with precise fusion splicing to cleaved optical fiber ends, enables highly efficient and low-loss optical coupling. This methodology ensures robust and stable alignment, eliminating the necessity for active repositioning and realignment during operation, thereby improving overall system performance in integration photonic circuits with muti layer fiber system.

Conclusion

This research article provides an in-depth solution involving re-designing and manufacturing semiconductor devices in utilizing the muti-layer-fiber, with a focus on innovation quantum computing chips. In the past, quantum computers operate at cryogenic temperatures, typically around -150°C, which greatly limited their practicality for widespread use. This innovative research study introduces a groundbreaking paradigm shift by using multi-layer optical fiber interconnects to improve the performance and energy efficiency of quantum chips. This multi-layer fiber approach enables the lens of fiber parallel transmission of quantum bits (qubits), allowing for the simultaneous processing of zero and one states, thus addressing key bottlenecks in current quantum computing architectures. This innovative research proposed an innovative approach that offers promising solutions to existing issues in quantum hardware scalability, reliability, and operational stability, representing a significant advancement in quantum information processing. Our research sheds light on the potential for quantum chip production that could benefit humanity.

Declarations

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References

1. Kao, K.C. and Hockham, G.A. 1966. Dielectric-fibre surface waveguides for optical frequencies. Proceedings of the Institution of Electrical Engineers, 113(7): 1151-1158.

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