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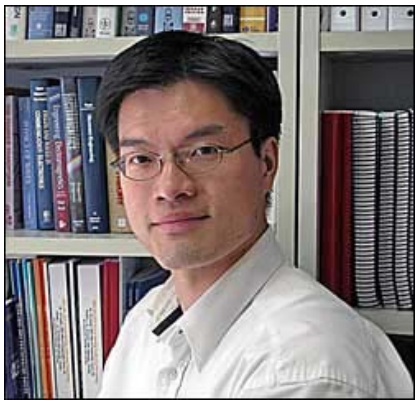


Technology

Light technology benefits medicine and communications

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To see or not to see, that is the question. Most people have a perception of "light" as visible light. Unfortunately, "light" is not a well-defined term.

Technically speaking, visible light is only a very narrow spectra of what we call electromagnetic waves, which travel at the speed of light - or according to our high-school analogy, traveling around the Earth 7.5 times in a second.

As an electrical and electronic engineer, I always need to explain how light, sometimes called photonics, is related to traditional electrical and electronic engineering.

Electrical and electronic engineering is such an evolutionary area these days that it is no longer only about electricity and electronics, it is much more than that.

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One of the most straightforward applications of photonics is in lighting.

Many people must have enjoyed the Symphony of Lights across Victoria Harbour, particularly the spectacular version on New Year's Eve.

Another promising application is the light-emitting diode, or LED, lighting. There will be another article dedicated to this topic on February 2.

Furthermore, different biomedical applications such as the use of lasers in dentistry, eye surgery (LASIK), oncology, dermatology or optical imaging techniques, to name a few, would not be possible without photonics technology.

Communications is one area that benefits most from the advancements in photonics, ranging from long-haul transmission of more than 10,000 kilometers down to the scale of tenths of millimeters.

The former is the backbone of the internet with fiber cables across the Pacific and Atlantic oceans.

A single piece of fiber can provide gigantic bandwidth - for example 5 terabits (or 5,000,000,000,000 bits) per second versus a 3G voice call of two million bits per second. Fiber-to-the- home technology allows us to access up to one billion binary digits in a second.

We have, on the other hand, the very short reach distance, such as the optical interconnect within computer chips.

As the senior vice president of Intel, Patrick Gelsinger, has said: "Today, optics [photonics] is a niche technology. But tomorrow, the technology becomes the mainstream of every chip that we build." Dr Kenneth Wong is an assistant professor with the Department of Electrical and Electronic Engineering, University of Hong Kong



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