How AI Will Blanket Your World

Whether we are aware of it or not, artificial intelligence is already all around us. We use AI when we speak to our digital assistants. AI is in email services that automatically complete our sentences or schedule appointments for us. We encounter it when bots field our queries on websites or smartphones unlock upon recognizing our faces.

AI is also constantly at work in subtler ways we may not notice, such as coordinating the dispatch of elevators to speed people to their destinations in an office tower, routing us around traffic jams even before they occur and serving up streaming videos that we're likely to enjoy.

This is only an early preview of the massive changes AI will create in our world over the next few years. Forrester Research estimates that 29% of global development managers have already worked on AI projects during the past year. IDC predicts that 70% of companies will be investing in training and development to support the changes in the workplace created by AI applications by 2023 and that worldwide AI-related revenues will surpass $300 billion in 2024.
In the future, AI will become increasingly intertwined with our day-to-day activities, guiding us toward better decisions at work, automating rote tasks and tackling problems too complex for humans to untangle, such as predicting complex drug interactions. Software will recommend improvements to workflows and automatically take over tasks that don't require human decisions. Smart cameras will detect crowds gathering and alert access control systems to automatically redirect traffic for social distancing.

Devices Get Smarter
AI will increasingly be part of the devices we use. Autonomous vehicle-only thoroughfares won't have traffic lights or stop signs because on-board navigation systems communicating with traffic orchestrator will route traffic to negate the need. Video games will deliver experiences customized to each individual player.
All of this will take an enormous amount of computing power dispersed to the edge of networks, a phenomenon called edge computing. These distributed networks will bring decision-making closer to the points where decisions matter most: on the road, in the factory and in the home.

Achieving this potential will require microprocessor architectures that are purpose-built for AI. Those processors will even use AI to make themselves run more efficiently. Envisioning this future, Intel is already building chipsets that support machine learning and deep learning applications in hardware and use intelligent algorithms to govern the way components inside the chipset are used.

For example, the Tiger Lake generation of Intel Core mobile processors incorporate Intel's Xe discrete graphics processing unit. GPUs are a specialized processor originally developed for use in

graphics rendering applications such as video games. GPUs have become one of the most important engines of machine learning and deep learning development. They are much faster than CPUs for certain tasks, such as floating point computation, and they support many more cores. For example, the Xe comes with up to 4,096 cores compared with four in the CPU. Whereas CPUs are better at handling imperative programming tasks such as processing conditional statements, GPUs excel at performing calculations in parallel and at scale. The two complement each other nicely.

A Marriage of GPUs and CPUs

Intel's new Tiger Lake line of processors combine GPU and CPU functionality on the same chipset. This creates an extremely powerful foundation for AI. For example, Tiger Lake's native support for the AV1 video coding format eliminates the need for an outboard video processor, which dramatically speeds up the encoding and decoding of video in transmission. That not only improves the user experience but also prolongs battery life and lowers heat generation.

Intel has also incorporated some clever applications of AI within its own microprocessors. For example, Intel's Performance Maximizer software continually analyzes the characteristics of a computer workload and adjusts resources accordingly. It can turbo boost the CPU dynamically as well as shut down functions that aren't needed for a particular workload. That reduces the need for cooling, reduces wear on components and greatly extends battery life.

The integrated GPU in Tiger Lake is also designed to take work off the CPU to improve performance. Functions like encryption and malware detection lend themselves well to GPU processing. Software and hardware OEMs can take advantage of this capability to dynamically reallocate parts of their software stack to run on a GPU if the Intel chipset is present.

All of these factors together make the evolving Intel platform an integrated AI engine. As other parties build upon these capabilities, the impact of AI on our world will grow at an ever-increasing rate.

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What Is a GPU?

Graphics processing technology has evolved to deliver unique benefits in the world of computing. The latest graphics processing units (GPUs) unlock new possibilities in gaming, content creation, machine learning, and more.

What Does a GPU Do?

The graphics processing unit, or GPU, has become one of the most important types of computing technology, both for personal and business computing. Designed for parallel processing, the GPU is used in a wide range of applications, including graphics and video rendering. Although they're best known for their capabilities in gaming, GPUs are becoming more popular for use in creative production and artificial intelligence (AI).

GPUs were originally designed to accelerate the rendering of 3D graphics. Over time, they became more flexible and programmable, enhancing their capabilities. This allowed graphics programmers to create more interesting visual effects and realistic scenes with advanced lighting and shadowing techniques. Other developers also began to tap the power of GPUs to dramatically accelerate additional workloads in high performance computing (HPC), deep learning, and more.

What Are GPUs Used For?

Two decades ago, GPUs were used primarily to accelerate real-time 3D graphics applications, such as games. However, as the 21st century began, computer scientists realized that GPUs had the potential to solve some of the world's most difficult computing problems.

This realization gave rise to the general purpose GPU era. Now, graphics technology is applied more extensively to an increasingly wide set of problems. Today's GPUs are more programmable than ever before, affording them the flexibility to accelerate a broad range of applications that go well beyond traditional graphics rendering.

From: https://www.intel.com/content/www/us/en/products/docs/processors/what-is-a-gpu.html