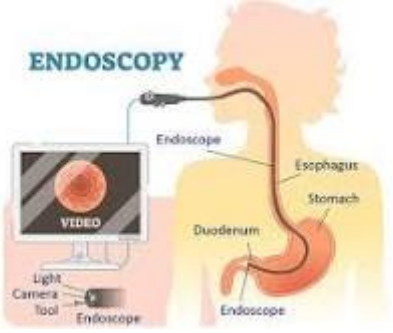
Intel 12th Gen CPU is Driving Force Behind AI-Based Endoscopy Systems

GI endoscopies have become quite commonplace. But the technology behind them continues to improve, making for better, safer procedures.

An endoscopy has become fairly routine. It's a procedure that involves inserting a thin, flexible tube called an endoscope into the patient's throat and down into the esophagus. A tiny camera is typically embedded onto the tip of the endoscope that allows the performing physician to closely examine the patient's esophagus and stomach, and even the beginning of the small intestine, known as the duodenum.



The GI endoscopy is quite common today. However, the procedure itself is performed quite differently than in the recent past, and continues to evolve.

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While there are other types of endoscopies and other related methods, the described traditional procedure is performed on a daily basis to an enormous amount of people, with an overwhelmingly high success rate. Because of the volume of procedures, technologists are continually on the lookout for ways to improve this medical procedure. And with the technology available today, it was almost inevitable that new advances would occur, and they have.

For example, a relatively new instrument, the self-propelled colonoscope is under development. This innovative tool is designed to enhance visualization and minimize the risks of patient complications. The robotic tool provides a 360-degree view when inside the body and, in most cases, offers a less painful experience.

On the software side, tools are now available that help render much higher quality digital images. And as we know, digital imaging can be manipulated, stored, transferred, and transmitted, yet retain its original high quality and value. For example, the latest narrow-band imaging (NBI) endoscope is designed with a special filter to help create more contrast between vessels and the mucosa and thereby provide a more detailed and clearer image.

AI Enters the Endoscopic Picture

Today, artificial intelligence (AI) is a trendy topic that relates to many medical procedures, and that certainly includes gastrointestinal (GI) endoscopies, where AI is widely used to analyze the GI endoscopy image data. This relatively new technology has led to several clinically approved algorithms for polyp detection, one of the driving reasons behind endoscopy in the first place.

AI has the potential to improve the quality of GI endoscopy at all levels, as it can compensate for human error and potentially limited capabilities of today's physicians by bringing more accuracy, consistency, and higher speed to this all too common procedure.

While not in widespread use yet, AI has shown great results in diagnostic and therapeutic endoscopies in all parts of the GI tract. While it's too early for widespread adoption, the promise that it shows is cause for celebration from the medical community, bringing major improvements to GI endoscopy at all levels.

At the center of many of these AI-enabled GI endoscopies is an Intel 12th generation microprocessor (codenamed Alder Lake), which provides the powerful tool kits to enable medical AI. This highly versatile CPU offers a balance of performance and power with up to 14 cores and 20 threads, a base power range of 15 to 45W, and use of high-bandwidth DDR5 and LPDDR5 memory.

Note that the Intel 12th Gen Core processors are the first in the Intel Core family to feature Intel's Thread Director hybrid architecture that combines Performance-cores (or P-cores) that focus on primary workloads with Efficient-cores (or E-cores) that are built for multitasking. Thread Director intelligently directs the operating system to match the appropriate workload to the right core to maximize performance and efficiency.

In AI-based GI endoscopy applications, the Intel 12th Gen Core processors help to improve graphics performance with up to 16 lanes of PCIe 4.0 tied directly to the CPU. This level of performance is sufficient to provide a data bandwidth that's fast enough for the medical imaging. In addition, Intel DL Boost operates seamlessly with the company's Iris GPU to accelerate inferencing for AI-enabled medical applications. And thanks to Intel's long-life availability, medical systems engineers can leverage the lengthy certification cycles that are common in medical device development.

Harnessing This Potential for GI Endoscopy

The performance and efficiency levels achieved by the Intel 12th Gen Core processors when combined with the Intel Iris GPU are helping system designers maintain relatively small form factors for their end systems, which is a requirement for areas like operating rooms (as evidenced in the video, showing the future of endoscopy). To ensure market viability and success, the GI endoscopy device must operate comfortably in typical surgical rooms, without the need for specialized powering or cooling requirements. And that's exactly what embedded systems experts like Wincomm have been able to provide, using this latest technology.

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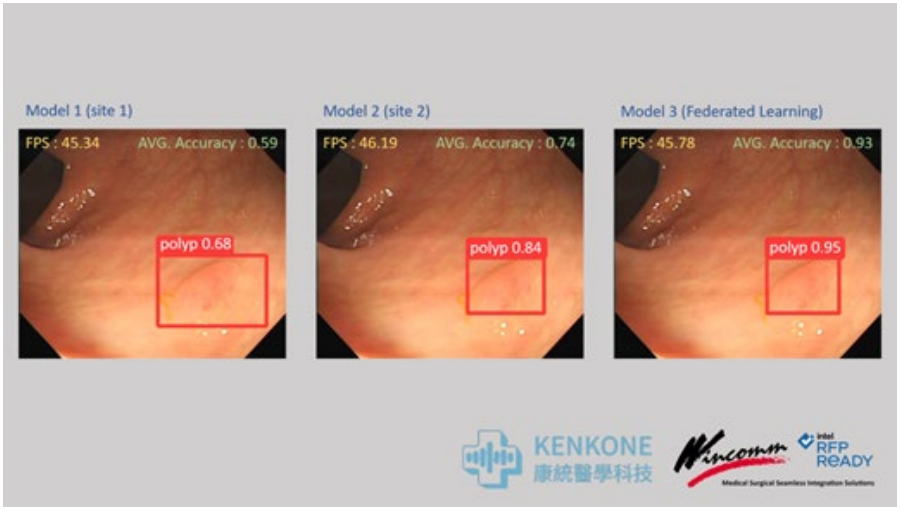
Operating rooms are already quite crowded. Hence, any new equipment that's introduced must conform to strict power and space guidelines.

In the long run, the benefits become quite clear to the physician, the patient, and the medical facility. At the same time, it's important to point out the ever-present privacy concerns in the medical space. Designers must adhere to the latest specifications to ensure the sanctity of the data.

The Virtual Assistant

Using natural-language processing and voice AI technologies, the Kenkone Medical EVAS® (Endoscopy Virtual Assistant System) is being deployed with four digital offerings, all with the potential to transform the future of endoscopy. The EVAS® provides auditory and visual assistance to endoscopists to ensure quality examinations.



The Kenkone EVAS® enables higher speed and precision, using three data input sites, compared to the typical one or two.

According to Kenkone Medical's CEO, Dr. Wade Liao, "We are transforming the future of endoscopy. The virtual assistant can significantly ease the surgeon's burden while providing better care to patients."

Kenkone's EVAS® is based on natural-language processing and, thanks to its AI characteristics, can dynamically generate labels and update its library. In alignment with Wincomm's medical PCs, it automatically generates reports during an endoscopy surgery. This solution supports real-time AI transcriptions to ensure accurate and effortless data entry.

At the end of the day, whether you are the patient, the physician, or the hospital administrator, you should see AI-based GI endoscopies as a welcome sight. And thanks to technology from Intel and Wincomm, that vision is becoming quite clear.