LOW POWER COMPRESSION ALGORTIHM FOR WIRELESS CAPSULE ENDOSCOPY

Invention:

Wireless-capsule-endoscopy (WCE) is a state-of-the-art technology to receive images of human intestine for medical diagnostics. In WCE, the patient ingests a specially designed electronic capsule which has imaging and wireless transmission capabilities inside it. While the capsule travels through the gastrointestinal (GI) tract, it captures images and sends them wirelessly to an outside data recorder unit. The data recorder stores the images and later the data is transferred to another platform (i.e., personal computer (PC), diagnostics machine, etc.) where the images are reconstructed and displayed for medical diagnosis. The capsule runs on button batteries that need to supply power for about 8-10 hours. The key design challenge in capsule endoscopic system is to reduce the area and power consumption of the capsule while maintaining acceptable video quality. In this work, a novel and low-complexity image compression algorithm tailored for endoscopic images is presented

Wireless capsule endoscopy is more comfortable for the patients than wired endoscopy and complete examination of the small intestine can be performed using this technique. In this research, a capsule-implantable and low-complexity image compressor tailored for endoscopic images is presented. The compressor is designed to work with any commercial low-power image sensor that outputs image pixels in raster scan fashion, eliminating the need of buffer memory and temporary storage (as needed in transform coding schemes).

Applications:

In the US alone, over 3 million people suffer from GI diseases annually. Over one-third of these cases, the cause is never found. WCE can be efficiently used to detect diseases of the GI tract such as sources of bleeding, lesions, ulcers and tumors.

Some of the applications for this technology is in;

1. Medical Devices
2. Healthcare Systems
3. Biomedical Engineering
4. Biomedical Imaging
5. Wireless Sensor Networks

Advantages over existing Technology:

Wireless capsule endoscopy is more comfortable for the patients than wired endoscopy and complete examination of the small intestine can be performed using this technique. The capsule runs on button batteries that need to supply power for about 8-10 hours. The key design challenge in capsule endoscopic system is to reduce the area and power consumption of the capsule while maintaining acceptable video quality. In this research, an implantable and low-cost (area and power) image compressor for the endoscopy capsule is presented.

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