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J-BHI Special Issue on “Medical Image Analysis Embedded on Microprocessors”

Wireless telemedicine uses modern communication technology and computer multimedia technology to provide long-distance medical information and services. Wireless transmission, such as cellular 5G/6G and WiFi technologies, allow the access to vital information anywhere and at any time within the healthcare networks. Patient data, the main data of telemedicine which are needed to be transmitted by wireless, including current treatments, health history, allergies to medications, laboratory tests and results, and insurance information need to be retrieved at any time from the healthcare personnel. Most of the current patient data captured by novel embedded sensors, are required to wirelessly transmitted from the embedded sensors to ubiquitous and pervasive computing devices with embedded microprocessors. The wireless transmission for medical data on ubiquitous and pervasive computing devices with embedded microprocessor has higher requirement of real-time, accuracy and progressive. The medical image lesion detection technology combines computers with other high-speed, large-scale integrated digital hardware. The current medical imaging diagnosis requires the doctor’s experience to determine. Using image processing technology to analyze and process 2D slice images can assist doctors in qualitative and even quantitative analysis of lesions and other areas of interests, thereby significantly improving the accuracy and reliability of medical diagnosis.

Employing embedded technology into medical image lesion detection systems is becoming possible. The embedded medical image lesion detection has many advantages such as small size, low cost, good stability, and strong adaptability, which is applied to medical image recognition and diagnosis, which can significantly alleviate the burden of massive and complex medical image data on doctors and help doctors diagnose diseases that are difficult to detect.

As wireless telemedicine is applied and developed, the transmission of high-quality images is a major issue worthy of medical and communication research. Through wavelet vector quantization compression coding, concatenated coding, spread spectrum modulation, and anti-interference technology, the influence of fading channel and interference on medical image transmission is suppressed to ensure the reliability of transmission. The concatenated code with high compression ratio and weak error correction for the high-frequency sub-image can obtain effective visual effect and image quality.

Therefore, this special issue focuses on embedded microprocessors under wireless transmission in medical imaging lesion detection systems and provides researchers in related fields with opportunities for discussions. Only high-quality and original research contributions will be considered. The special issue will highlight, but not be limited to, the following topics:

- The root file system of the medical image microprocessor
- Design of extended architecture of medical image microprocessor
- Development of driver program for medical image microprocessor
- Fast imaging and reconstruction of medical images
- Medical image quality evaluation model
- Medical image segmentation/registration/edge detection/feature extraction under embedded microprocessor system
- Transformation of medical image parameters under the embedded microprocessor system
- Cellular and WiFi network architectures for wireless telemedicine
- High quality transmission of wireless telemedicine image
- Anti-interference technology for medical image transmission
- Multi-channel resource allocation for image transmission
- Fusion model and algorithm of multimodal medical image

- Medical information security based on watermark/blockchain
- ECG/EEG/EMG/EOG data analytic
- Auxiliary diagnosis model and algorithm of medical image
- Explainable deep structure in medical image analysis
- Clinical application based on intelligent recognition and analysis of medical images

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Key Dates

- Submission deadline: **March 1st, 2022**
- First reviews due: **May 1st, 2022**
- Revised manuscript due: **July 1st, 2022**
- Final decision: **September 1st, 2022**
- Camera ready version: **November 1st, 2022**

