

Editorial

Artificial intelligence for medical image processing

With the discovery of the X-ray in 1895, images started to be used for medical diagnostics. With the increased use of the digital imaging system, digital image processing has become increasingly important in health care. Today millions of medical images are processed worldwide every week.

Over the last few years, we have seen artificial intelligence (AI) revolutionizing the medical image processing. Numerous AI-based tools have been developed to automate medical image processing and improve automated image interpretation. Especially deep learning and neural networks approaches have demonstrated exceptional performance in the screening and diagnosis of many diseases.

In this special section of *Technology and Health Care*, we discuss four research articles. The paper by Zhang Zhi introduces a deep learning method to solve the problem of semantic-based medical image segmentation. First, the unlabeled image block samples are used to train the stacked noise reduction automatic encoder. The deep features of the image obtained from the training are used to construct the initial depth neural network model. Second, the labeled image block samples are used to fine-tune the initial depth neural network model. The deep layer features of the image are used to obtain the depth neural network model with classification function. Finally, threshold segmentation and morphological methods are used to optimize the initial results to obtain accurate segmentation. The experimental results show that the average segmentation accuracy is improved to 98.04% (before optimization) and 99.84% (after optimization).

The paper by Jie Liu and Hongbo Zhao introduces an improved structure of the classical LeNet-5 convolutional neural network. The authors used this new convolutional neural network to obtain the recognition of the eye blood silk data set. The results show that improved structure of the convolutional neural network can classify the diseases reflected by the eyeball bloodstain.

The paper by Feng Xu and Jia Huang presents a deep learning algorithm to process the fuzzy edges of contrast image. The experiment result shows that the edge and boundary of the image become clear and separable after processing.

The paper by Xufang Li *et al.*, introduces a sequential robust convex optimization algorithm to conduct medical image enhancement.

I look forward to the time when more research will come forward with new ideas and *Technology and Health Care* is used as a forum for the exchange of ideas.

Dr. Xiaolong Li
Guest Editor

Department of Electronics and Computer Engineering Technology
Indiana State University
Terre Haute, Indiana, USA
E-mail: Xiaolong.li@indstate.edu