

## 7 EPIDEMIC STUDY OF LOW-TEMPERATURE HIGH-VOLTAGE TRANSMISSION ON HEALTH OF HUMANS

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**Background** Electromagnetic fields (EMFs) are widely distributed in our environment. The behaviour of organisms in contact with different low-temperature and high-voltage EMFs was compared. It is necessary to investigate the influence of environment EMFs on human health.

**Methods** We measured the changes in function of the brain, heart and muscle using bioelectromagnetic instruments and methods as well epidemiological investigations in 854 women and men regularly exposed to EMFs. The changes in function were measured using the EGI system 200 Brain electrical information instrument and multi-channel physiological signal system.

**Results** We found that the strengths of EMFs are depressed by decreasing their height from 6500 V/m and 0.1 G to 350 V/m and 0.01 G. EMFs result in memory loss, distraction, increase in blood fat, chronic diarrhea, anemia and the incidence of hoarseness symptoms. EMFs also depress the incidence of leukopenia and thrombocytopenia.

**Conclusion** EMFs of low-temperature and high-voltage can change the properties of the images of the brain, as well as heart electrical information.

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## 8 THE PREDICTION OF AN ULTRA-LOW TEMPERATURE ONLINE MOTOR MONITORING SYSTEM ON THE SURVIVAL RATE OF LIVING CELLS

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**Background** Biological samples and other medical items such as blood and bone marrow need to be kept in an ultra-low temperature environment. A prediction of low-temperature living cell monitoring system was designed, aiming at the current situation of cryogenic temperature.

**Methods** The system mainly consists of a terminal node, sink node and host computer. By using neural network biofilm, the method predicts the motor speed at the next moment. The terminal node collects the information of the low temperature environment through the sensor and sends the collected information to the sink node regularly. To determine transmission efficiency, the entire system uses a modular structure, based on the scene quickly set up by the application system.

**Results** The system was tested in a hospital. The test results show that the system, which can measure temperatures between  $-200^{\circ}\text{C}$  and  $-100^{\circ}\text{C}$  with  $-0.5^{\circ}$  error with high precision and fast response times, and can upload data to the cloud in real time, fully meets the hospital's needs.

**Conclusion** We studied intelligent control combined with the remote monitoring system of ultra-low temperature freezer and the implementation of each module. The system provides accurate, convenient and reliable results in real time.

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## 9 DISCRIMINATION OF BREAST TUMORS IN ULTRASONIC IMAGES USING AN ENSEMBLE CLASSIFIER BASED ON TENSORFLOW FRAMEWORK WITH FEATURE SELECTION

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**Background** The aim of this study is to use the computer aided diagnostic (CAD) technique to help doctors interpret and diagnose the ultrasound images of mammary glands. CAD technology can reduce doctors' workload, improve objectivity and accuracy of ultrasound breast examination and help further diagnosis and treatment.

**Methods** This study chose to use the TensorFlow framework to train and predict the neural network. The GPU support version of TensorFlow's Windows platform was selected, and the CUBA toolkit and cuDNN library were used to support the GPU operation.

**Results** Combined with the convolution neural network algorithm in the field of deep learning, an automatic segmentation method for breast ultrasound images is proposed, which transforms the image segmentation task into the classification task of each pixel in the image.

**Conclusion** The CAD method can correctly distinguish the tissue area of skin, gland and tumor in breast ultrasound images. The shape and contour are similar to the standard results manually labelled by doctors, and have achieved good results in various quantitative evaluation indexes. In the experiment, the segmentation results generated by different neural network parameter configurations were compared with other methods which showed that the proposed method in this study has certain advantages.

## 10 WIRELESS LASER TRANSMISSION TECHNOLOGY FOR BIOMEDICAL IMAGE INFORMATION TRANSMISSION

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**Background** In the biomedical field, biomedical imaging and X-rays are common techniques, but there has been some damage to medical staff. Wireless laser transmission is the best technology for information transmission between the imaging detector and processing terminal. It can reduce system complexity and human injury.

**Methods** It is proposed that wireless laser communication technology be used for biomedical imaging. The DFB laser