

# 中国医学物理学杂志

CHINESE JOURNAL OF MEDICAL PHYSICS

月刊 1984年创刊 2022年12月25日第39卷第12期(总第233期)



主 管  
南方医科大学

主 办  
南方医科大学  
中国医学物理学会

编 辑  
《中国医学物理学杂志》编委会

主 编  
胡逸民

编辑部主任  
卢广文

出 版  
《中国医学物理学杂志》编辑部

通讯地址  
广州市同和南方医科大学  
生物医学工程学院  
电话:020-61648280  
传真:020-61360581  
邮编:510515  
网址:www.cjomp.com  
E-mail:YXWL@263.net.cn  
微信号:cjomp001

印 刷  
广州市艺彩印务有限公司

国内订阅  
全国各地邮政局  
邮发代号:46-259

国外订阅  
中国出版对外贸易总公司  
(北京782信箱)

国外发行代号  
DK44009

邮 购  
《中国医学物理学杂志》编辑部

定 价  
每册15.00元;全年180.00元

中国标准连续出版物号  
ISSN 1005-202X  
CN 44-1351/R

## 目 次

### 医学放射物理

- 基于光学体表监控和X射线透视影像的膈肌运动自动跟踪 ..... 谭翔,戴振晖,何强,张白霖,朱琳,蔡春雅,杨耕,简婉薇,王学涛(1453)  
剂量体积优化算法与光子优化算法在儿童全中枢调强放射治疗计划的剂量学比较 ..... 张平,邓官华,戴鹏,罗日顺,罗龙辉,黄庆(1460)

### 医学影像物理

- 基于卷积神经网络的宫颈CT图像的金属伪影去除 ..... 黄霞,许乙凯,张煜(1466)  
长尾分布下的PET-CT肺癌图像的深度学习网络检测与定位探索 ..... 梁智欣,邓戈龙,魏夏平,梁凤好,惠贤娟,梁怡君,李谦,黄小伟,罗荣城(1473)  
卷积神经网络的原理及其在医学影像诊断中的应用 ..... 王霄,朱恩照,艾自胜(1485)  
基于GPU的膝盖组织分割与显示方法 ..... 蒋先刚,张红斌(1490)  
双层探测器光谱CT虚拟平扫中重建层厚对肝细胞癌显示的影响 ..... 谢孟臻,吴斌,许立强,刘于宝,王金电,赵彦博,高俊文(1495)  
基于TensorMixup的脑胶质瘤全自动分割 ..... 计亚荣,王瑜,肖洪兵,邢素霞(1502)  
基于反距离加权插值和改进采样点数据合成的医学影像三维重建 ..... 宫宁,王瑜,王逸夫,肖洪兵,孙梅(1510)  
双线性非局部特征结合中继监督网络用于视网膜血管分割 ..... 杨东旭,赵红东,耿立新,于快快(1516)

### 医学信号处理与医学仪器

- 寸口桡动脉智能脉象采集与分析系统 ..... 王海龙,弓伟(1525)  
一种无线闭环迷走神经刺激器及系统 ..... 汤株雄,李效龙(1530)  
基于睡眠心电数据的人工智能抑郁评估系统 ..... 肖碧波,唐健豪,曾加玉,王肖文,魏晓滨(1538)

## 生物力学与材料

- 基于模糊变导纳的颅颌面手术机器人接触力控制 ..... 王泽华, 胡陟, 陆玮铭, 倪双涛(1544)  
主动脉出口血压对左心室血流特性的影响 ..... 李仁年, 李志雄, 韩伟, 冯慧敏, 郝英剑, 任嘉乐, 强彦(1550)

## 医学生物物理

- 1例三高病史患者同种异体肝移植手术配合报道 ..... 俞润英, 吴思燕, 苏稳定, 柴云飞(1558)  
经口腔前庭腔镜甲状腺切除术联合<sup>131</sup>I治疗化型甲状腺癌的近期效果及分析  
..... 徐伟宏, 梅锋, 李强(1563)  
不同时机支气管镜灌洗术治疗小儿腺病毒肺炎的临床研究 ..... 谢冰, 刘春花(1569)

## 医学人工智能

- 人工智能在医学领域的应用综述 ..... 秦江涛, 王继荣, 肖一浩, 李军(1574)  
基于深度学习的儿童肺炎检测模型建立及应用 ..... 董芳芬, 陈群, 李诺兮, 徐本华, 李小波(1579)

责任编辑:陈丽霞

责任校对:黄开颜 薛泽玲 谭斯允

英语校对:谭斯允

编 务:廖艳玲

期刊基本参数:CN44-1351/R \* 1984 \* M \* A4 \* 136 \* zh \* P \* ¥ 15.0 \* 800 \* 20 \* 2022-12



# CHINESE JOURNAL OF MEDICAL PHYSICS (Monthly)

Established in 1984

December 25, 2022, Vol.39, No.12 Total No. 233

## Responsible Institution

Southern Medical University

## Sponsored by

Southern Medical University  
Chinese Society of Medical Physics

## Edited by

Editorial Board of Chinese  
Journal of Medical Physics

## Editor-in-Chief

HU Yimin

## Editorial Director

LU Guangwen

## Published by

Editorial Department of Chinese  
Journal of Medical Physics

## Address

School of Biomedical Engineering,  
Southern Medical University,  
Tonghe, Guangzhou  
Postal code: 510515  
Tel: 86-20-61648280  
Fax: 020-61360581  
Http://www.cjomp.com  
E-mail: YXWL@263.net.cn  
Wechat: cjomp001

## Printed by

Guangzhou Yi Cai Printing  
Co., Ltd

## Domestic Subscription

Post offices all over China  
Post office subscription code:  
46-259

## Overseas Subscription

China National Publishing  
Industry Trading Corporation  
(P.O.Box. 782, Beijing, China)

## Mail Order

Editorial Department of Chinese  
Journal of Medical Physics

## China Standard Serial Numbering

ISSN 1005-202X  
CN 44-1351/R

## CONTENTS

### Medical radiation physics

- Automated diaphragm motion tracking using optical surface monitoring system and X-ray fluoroscopic image .....(1453)  
**TAN Xiang, DAI Zhenhui, HE Qiang, ZHANG Bailin, ZHU Lin, CAI Chunya, YANG Geng, JIAN Wanwei, WANG Xuetao**

- Dosimetric comparison of IMRT optimization with dose volume optimizer *versus* photon optimizer in pediatric craniospinal irradiation .....(1460)  
**ZHANG Ping, DENG Guanhua, DAI Peng, LUO Rishun, LUO Longhui, HUANG Qing**

### Medical imaging physics

- Metal artifact reduction in cervical CT images using convolutional neural network .....(1466)  
**HUANG Xia, XU Yikai, ZHANG Yu**

- Deep learning network for lung cancer detection and localization in PET-CT images under long-tailed distribution .....(1473)  
**LIANG Zhixin, DENG Gelong, WEI Xiaping, LIANG Fenghao, HUI Xianjuan, LIANG Yijun, LI Qian, HUANG Xiaowei, LUO Rongcheng**

- Principle of convolutional neural network and its applications in medical imaging diagnosis .....(1485)  
**WANG Xiao, ZHU Enzhao, AI Zisheng**

- Knee tissues segmentation and display based on GPU .....(1490)  
**JIANG Xiangang, ZHANG Hongbin**

- Effect of reconstructed slice thickness on the display of hepatocellular carcinoma in virtual non-contrast scan of dual-layer detector spectral CT .....(1495)  
**XIE Mengzhen, WU Bin, XU Liqiang, LIU Yubao, WANG Jindian, ZHAO Yanbo, GAO Junwen**

- Fully automated glioma segmentation based on TensorMixup .....(1502)  
**JI Yarong, WANG Yu, XIAO Hongbing, XING Suxia**

- Three-dimensional medical image reconstruction using inverse distance weight and improved data synthesis of sampling points .....(1510)  
**GONG Ning, WANG Yu, WANG Yifu, XIAO Hongbing, SUN Mei**

- Bilinear non-local features combined with intermediate supervision network for retinal vessel segmentation .....(1516)  
**YANG Dongxu, ZHAO Hongdong, GENG Lixin, YU Kuaikuai**

### Medical signal processing and medical devices

- Intelligent pulse acquisition and analysis system for radial artery .....(1525)  
**WANG Hailong, GONG Wei**

- Wireless closed-loop vagus nerve stimulator and its system .....(1530)  
**TANG Moxiong, LI Xiaolong**

- Artificial intelligence system for depression assessment based on sleep ECG data .....(1538)  
**XIAO Bibo, TANG Jianhao, ZENG Jiayu, WANG Xiaowen, WEI Xiaobin**





## Biomechanics and materials

- Controlling contact force in robot-assisted cranio-maxillofacial surgery using fuzzy variable admittance .....(1544)  
[WANG Zehua, HU Zhi, LU Weiming, NI Shuangtao](#)
- Effects of aortic outlet blood pressure on left ventricular blood flow characteristics .....(1550)  
[LI Rennian, LI Zhixiong, HAN Wei, FENG Huimin, HAO Yingjian, REN Jiale, QIANG Yan](#)

## Medical biophysics

- Operative cooperation in allogeneic liver transplantation for a case with a history of hypertension, hyperlipidemia and hyperglycemia .....(1558)  
[YU Runying, WU Siyan, SU Wending, CHAI Yunfei](#)
- Recent results and analysis of transoral endoscopic thyroidectomy vestibular approach combined with I for differentiated thyroid cancer .....(1563)  
[XU Weihong, MEI Feng, LI Qiang](#)
- Clinical study of different bronchoscopic lavage timings in the treatment of adenovirus pneumonia in children .....(1569)  
[XIE Bing, LIU Chunhua](#)

## Medical artificial intelligence

- Artificial intelligence in medical application: a review .....(1574)  
[QIN Jiatao, WANG Jirong, XIAO Yihao, LI Jun](#)
- Establishment and application of a deep learning-based model for pneumonia detection in children .....(1579)  
[DONG Fangfen, CHEN Qun, LI Nuoxi, XU Benhua, LI Xiaobo](#)

**Executive Editor:** CHEN Lixia

**Executive Proofreaders:** HUANG Kaiyan      XUE Zeling      TAN Siyun

**English Editor:** TAN Siyun

**Editorial Assistant:** LIAO Yanling