



Volume 19 Number 11  
November 2022

ISSN 1672-7029  
CN 43-1423/U

# 铁道科学与工程学报

Journal of Railway Science and Engineering

铁道科学与工程学报

Volume 19 Number 11

Pages 3117-3166

November 2022



中南大学 主办  
中国铁道学会

## 目次

### 高速铁路技术

- 高速铁路飞砗问题影响因素与研究进展 ..... 丁东,李杰,王辰永,井国庆(3117)  
考虑服务水平的高速铁路通过能力利用研究 ..... 邹信诚,李海鹰,廖正文,孟令云(3127)  
需求导向的高铁列车差异化定价与票额分配综合优化 ..... 苏焕银,徐光明,曾琼芳,彭舒婷,贾旭东(3138)  
高速列车过桥线缆位姿变化的扭转特性研究 ..... 崔志国,张强,谭磊,沈超,肖合婷,周伟(3148)

### 智慧交通与物流

- 融合预测控制和SQP算法的地铁列车编队运行控制研究 ..... 张熠雯,李树凯,陈泽彬,杨立兴(3157)  
轨道交通复杂网络演化对城市社区划分的影响研究 ..... 丁锐,张宜琳,周涛,杜毅鸣,张婷,陈智(3168)  
微观交通仿真模型参数标定研究综述 ..... 刘昕,刘志远,聂品,顾子渊(3179)  
基于随机仿真优化的公交时刻表再编制 ..... 刘鹏杰,郑亮(3190)  
医疗废物运输网络渗流风险鲁棒性建模与仿真 ..... 朱海彤,赵佳虹,胡鹏(3199)

### 轨道与基础

- 12号道岔区敷设钢弹簧浮置板的安全性研究 ..... 郭无极,曾志平,王卫东,胡广辉,曾强(3208)  
富春江特大桥轨道高低长波不平顺评估 ..... 李秋义,赵云哲,谢晓慧(3217)  
铁路路基降雨入渗过程中水-气两相渗流特性研究 ..... 贾羽,王晷,丁瑜,张家生,陈晓斌(3225)  
风积沙-土工格栅界面摩擦特性拉拔试验研究 ..... 聂如松,谭永长,郭一鹏,马世平,施文龙(3235)  
振动波在红层泥岩中传递规律及典型隔振措施效果研究 ..... 王通,刘先峰,袁胜洋,侯召旭,闵琦,白继航(3246)  
颗粒形状对砂土力学特性的影响研究 ..... 张宇,王晷,张家生,丁瑜,闫鹏,李度(3256)  
弥勒原状及压实膨胀土的土水特性及体变特性 ..... 王一博,陈锋,潘高峰,何宗弈,郑亦轩,袁胜洋(3266)  
稻壳灰固化重金属污染土力学性能及微观结构研究 ..... 李丽华,岳雨薇,李文涛,韩琦培,李欣,徐可(3275)

基于合流视距的高速公路主线合流路段圆曲线最小半径研究 ..... 李洋,潘兵宏,梅杰,谢振江(3283)

## 桥梁隧道与结构

基于高斯贝叶斯网络的大型钢桁梁桥损伤识别 ..... 袁明贵,辛宇,王佐才,段大猷(3293)

行波激励下高烈度区特大铁路悬索桥减震技术研究

.....宋光松,江辉,郭辉,陈良江,卢文良,周勇政,何友娣(3303)

川藏铁路同球向双球面支座简支梁桥减隔震分析 ..... 盛兴旺,张稼杰,郑纬奇,张智光,刘则程(3316)

开缝式柔性膜结构对5:1矩形柱体气动力的影响 ..... 尹亚鹏,王汉封,李欢,何旭辉,黄致睿(3326)

考虑排水体系时隧道突涌水分析 ..... 傅鹤林,安鹏涛,伍毅敏,成国文(3335)

道床-管片界面黏结对隧道变形影响 ..... 赵晨,金浩,肖军华(3343)

基于数字图像细观模型重构的土石混合体力学特性研究

.....贾朝军,梁国栋,黄娟,雷明锋,赵晨阳,张强,张建(3351)

基于有效摩擦因数的顶管隧道摩阻力计算方法研究 ..... 邹洋,彭立敏,雷明锋,叶艺超,施成华(3361)

岩石岩性Mask R-CNN智能识别方法与应用研究

.....雷明锋,张运波,王卫东,雷乃金,曾灿,肖勇卓,黄娟,龚琛杰(3372)

基于CNN与DCGAN的结构振动监测传感器故障诊断及监测数据恢复

.....郭旭,骆勇鹏,王林堃,刘景良,廖飞宇,游德泉(3383)

## 智能制造与装备

多级滑动摩擦式列车挡车器设计与碰撞过程动态响应分析 ..... 肖皓,鲁寨军,钟睦,范登科(3396)

基于车车通信的列控系统后备模式研究 ..... 李强,陈子健(3407)

基于空间轨迹分类网络模型的T型逆变器开路故障诊断方法 ..... 李凯迪,伍珣,向灿群,于天剑(3417)

TBM刀盘裂纹分析及止裂方案研究 ..... 刘建琴,郭晓,闫康伟,安蔚瑾,宋欣(3428)

## 工程经济与管理

“绿色铁路设计”核心理念的界定及应用探讨—以某进藏铁路工程为例

.....李艳鸽,姜楠,韩征,黄健陵,冉墨文(3439)

多场景智慧高速公路的交通气象观测站点布设 ..... 张昕冉,孙洪运,张立涛(3447)

PPP垃圾焚烧发电项目政府补贴模型及实证分析 ..... 李倩,刘玉玲,韦洁琳(3457)

责任编辑: 蒋学东 英文编审: 杨小礼

期刊基本参数: CN43-1423/U\*2004\*m\*A4\*350\*zh\*P\*¥50.00\*1500\*35\*2022-11

## CONTENTS

### High-speed Railway Technology

- Influence factors and research progress of ballast flight in high-speed railways  
.....DING Dong, LI Jie, WANG Chenyong, JING Guoqing(3117)
- Research on utilization of carrying capacity of high-speed railway considering service level  
.....ZOU Xincheng, LI Haiying, LIAO Zhengwen, MENG Lingyun(3127)
- Collaborative optimization of differential pricing and seat allocation for multiple high-speed trains considering passenger demand  
..... SU Huanyin, XU Guangming, ZENG Qiongfang, PENG Shuting, JIA Xudong(3138)
- Investigation on torsion characteristic of high-speed train cables due to attitude variation  
.....CUI Zhiguo, ZHANG Qiang, TAN Lei, SHEN Chao, XIAO Heting, ZHOU Wei(3148)

### Intelligent Transportation and Logistics

- Study on operation control for metro train formation incorporating predictive control and sequential quadratic programming  
.....ZHANG Yiwen, LI Shukai, CHEN Zebin, YANG Lixing(3157)
- Influence of evolution of rail transit complex network on urban community division  
.....DING Rui, ZHANG Yilin, ZHOU Tao, DU Yiming, ZHANG Ting, CHEN Zhi(3168)
- Survey of microscopic traffic simulation calibration methods .....LIU Xin, LIU Zhiyuan, NIE Pin, GU Ziyuan(3179)
- Bus timetable reformulation based on stochastic simulation optimization .....LIU Pengjie, ZHENG Liang(3190)
- Model and simulation for the percolation risk robustness of medical waste transportation network  
.....ZHU Haitong, ZHAO Jiahong, HU Peng(3199)

### Track and Foundation

- Safety study of steel spring floating plates applied to No. 12 turnout  
.....GUO Wuji, ZENG Zhiping, WANG Weidong, HU Guanghui, ZENG Qiang(3208)
- Evaluation of track long-wave vertical irregularity on Fuchun River super large bridge  
.....LI Qiuyi, ZHAO Yunzhe, XIE Xiaohui(3217)
- Characteristics of water-air two-phase flow in railway subgrade under rainfall infiltration  
.....JIA Yu, WANG Xuan, DING Yu, ZHANG Jiasheng, CHEN Xiaobin(3225)
- Pullout test study of frictional resistance characteristics of geogrids and aeolian sand interface  
.....NIE Rusong, TAN Yongchang, GUO Yipeng, MA Shiping, SHI Wenlong(3235)
- Transmission law of vibration wave in red mudstone and effect of typical vibration isolation measures  
.....WANG Tong, LIU Xianfeng, YUAN Shengyang, HOU Zhaoxu, MIN Qi, BAI Jihang(3246)
- Study on the influence of particle shape on the mechanical properties of sand  
.....ZHANG Yu, WANG Xuan, ZHANG Jiasheng, DING Yu, YAN Peng, LI Du(3256)
- Soil water characteristics and deformation characteristics of mile intact expansive soil and compacted expansive soil  
.....WANG Yibo, CHEN Feng, PAN Gaofeng, HE Zongyi, ZHENG Yixuan, YUAN Shengyang(3266)

- Mechanical properties and microstructure of heavy metal contaminated soil solidified by rice husk ash  
 ..... LI Lihua, YUE Yuwei, LI Wentao, HAN Qiwei, LI Xin, XU Ke(3275)
- Minimum radius of circular curve for merging section of highway mainline based on merging sight distance  
 .....LI Yang, PAN Binghong, MEI Jie, XIE Zhenjiang(3283)

## **Bridge,Tunnel and Structure**

- Damage detection of large-scale steel truss bridge based on Gaussian Bayesian network  
 .....YUAN Mingguai, XIN Yu, WANG Zuocai, DUAN Dayou(3293)
- Seismic reduction technology of long-span railway suspension bridge in high-intensity area with the action of traveling wave effect  
 .....SONG Guangsong, JIANG Hui, GUO Hui, CHEN Liangjiang, LU Wenliang, ZHOU Yongzheng, HE Youdi(3303)
- Seismic isolation analysis of Sichuan-Tibet Railway simply supported beam bridge with double-spherical bearing in the same direction  
 ..... SHENG Xingwang, ZHANG Jiajie, ZHENG Weiqi, ZHANG Zhiguang, LIU Zecheng(3316)
- Effects of open-slit flexible film structure on aerodynamics of a 5:1 rectangular cylinder  
 .....YIN Yapeng, WANG Hanfeng, LI Huan, HE Xuhui, HUANG Zhirui(3326)
- Analysis of tunnel water inrush considering drainage system .....FU Helin, AN Pengtao, WU Yimin, CHENG Guowen(3335)
- Influence of interface bonding between invert-filling and segments on tunnel deformation  
 ..... ZHAO Chen, JIN Hao, XIAO Junhua(3343)
- Study on mechanical characteristics of soil rock mixture based on reconstruction of digital image meso-model  
 ..... JIA Chaojun, LIANG Guodong, HUANG Juan, LEI Mingfeng, ZHAO Chenyang, ZHANG Qiang, ZHANG Jian(3351)
- Study on calculation method of friction resistance of pipe jacking tunnel based on effective friction coefficient  
 ..... ZOU Yang, PENG Limin, LEI Mingfeng, YE Yichao, SHI Chenghua(3361)
- Investigation and application on lithology intelligent recognition method based on Mask R-CNN  
 ..... LEI Mingfeng, ZHANG Yunbo, WANG Weidong, LEI Naijin, ZENG Can, XIAO Yongzhuo, HUANG Juan, GONG Chenjie(3372)
- Fault self-diagnosis of structural vibration monitoring sensor and monitoring data recovery based on CNN and DCGAN  
 ..... GUO Xu, LUO Yongpeng, WANG Linkun, LIU Jingliang, LIAO Feiyu, YOU Dequan(3383)

## **Intelligent Manufacturing and Equipment**

- Design of multi-level sliding friction buffer stop and analysis of dynamic response in crash process  
 .....XIAO Hao, LU Zhajun, ZHONG Mu, FAN Dengke(3396)
- Research on backup mode of train control system based on train-to-train communication ..... LI Qiang, CHEN Zijian(3407)
- Open-circuit fault diagnosis method for t-type inverter based on space trajectory classification network model  
 .....LI Kaidi, WU Xun, XIANG Canqun, YU Tianjian(3417)
- TBM cutter-head crack analysis and crack stopping scheme research  
 .....LIU Jianqin, GUO Xiao, YAN Kangwei, AN Weijin, SONG Xin(3428)

## **Engineering Economy and Management**

- Discussion on definition and application of the core concept of Green Railway Design-a case study of a Tibet railway project  
 .....LI Yange, JIANG Nan, HAN Zheng, HUANG Jianling, RAN Mowen(3439)
- Locating road weather information system stations on multi-scenario smart expressway  
 ..... ZHANG Xinran, SUN Hongyun, ZHANG Litao(3447)
- Government subsidy model and empirical analysis of PPP waste-to-energy incineration projects  
 .....LI Qian, LIU Yuling, WEI Jielin(3457)