

热烈庆祝我校更名为  
华北水利水电大学



RCCSE中国核心学术期刊(扩展版)  
河南省一级期刊

ISSN 1002-5634  
CN 41-1249/TV

# 华北水利水电学院

# 学报

## 3

## 2013

JOURNAL  
OF NORTH  
CHINA INSTITUTE  
OF WATER  
CONSERVANCY AND  
HYDROELECTRIC POWER

ISSN 1002-5634



9 771002 563077  
万方数据

第34卷 第3期  
Vol.34 No.3

# 华北水利水电学院学报

第 34 卷第 3 期

(1980 年创刊)

(2013 年 6 月)

## 目 次

### 钢结构软件开发专题

|                                  |                |      |
|----------------------------------|----------------|------|
| 基于 Inventor 平台的平板钢闸门智能系统设计 ..... | 魏 群, 刘凤莲, 尹伟波  | (1)  |
| BIM 技术在平板钢闸门三维设计软件研发中的应用 .....   | 魏 群, 魏鲁双, 孙 凯  | (5)  |
| 钢结构有限元计算的精细模型建立 .....            | 魏 群, 姜 华       | (9)  |
| 三维结构 CAD 图形与虚拟现实文件的转换 .....      | 刘尚蔚, 张树塔       | (13) |
| 云技术在钢结构工程软件开发中的应用 .....          | 魏鲁双, 刘尚蔚       | (16) |
| 平板钢闸门数字图形模板库的建立与应用 .....         | 尹伟波, 孙 凯, 魏鲁双  | (19) |
| 钢结构通用连接板设计技巧 .....               | 周伦钢, 高阳秋晔, 魏 群 | (22) |
| Inventor 平台上平板钢闸门自动出图与尺寸标注 ..... | 尹伟波, 新丽辉, 魏 群  | (25) |
| 钢结构施工过程动态可视化仿真软件的开发与应用 .....     | 姜 华, 全 亮, 高阳秋晔 | (29) |
| 大型复杂钢桁桥梁三维精细建模 .....             | 姜 华, 彭运动, 于 欢  | (33) |
| 钢结构三维软件坐标系统的建立与转换 .....          | 孙 凯, 魏鲁双, 周伦钢  | (37) |

### 水利工程

|                              |                       |      |
|------------------------------|-----------------------|------|
| 甘肃省近 48 年春旱时空变化趋势分析 .....    | 马建琴, 韩 曦              | (40) |
| 基于聚能随进技术的冰凌爆破数值模拟及试验研究 ..... | 孟闻远, 刘 鑫, 胡俊强         | (44) |
| 基于聚能随进技术的冰凌爆破阵列数值模拟 .....    | 胡俊强, 孟闻远, 刘 鑫         | (48) |
| 泾河流域水沙特性空间尺度变化分析 .....       | 崔小红, 周祖昊, 邱 林         | (51) |
| 弧底梯形渠道收缩水深计算方法的简化 .....      | 滕 凯, 张丽伟              | (55) |
| 新疆藏桂乡支渠防渗设计中主要参数问题研究 .....   | 田林钢, 努尔曼古丽·艾尔肯, 阿不力米提 | (59) |
| GIS 在水文水资源领域中的应用研究 .....     | 张海廷                   | (63) |

### 地质资源与地质工程

|                             |                    |      |
|-----------------------------|--------------------|------|
| 边坡治理综合评价方法研究 .....          | 赵二平, 曹秀军           | (67) |
| 南水北调中线工程段弱膨胀土的动力学性质研究 ..... | 湛 川, 李 刚, 刘莹莹      | (70) |
| 点云数据多站拼接在水利工程测绘中的应用 .....   | 张永光, 刘豪杰, 尹小磊, 刘朋俊 | (74) |
| 河南省砂姜黑土土壤剖面特征及利用改良建议 .....  | 刘海艳, 李跃鹏           | (78) |

### 动力工程

|                                |                         |      |
|--------------------------------|-------------------------|------|
| 基于 MATLAB 实现同步电机自同步并列的仿真 ..... | 许 强, 陈巧玲, 侯永辉, 钱俊良, 宋 喆 | (82) |
| 配电网静止同步补偿器无功电流检测方法的研究 .....    | 平 增, 张忠锋, 张 娟, 张 辉, 张良学 | (86) |
| 家用空调外机生产线节能降耗研究 .....          | 杨 波, 王保华, 李玉蕾           | (90) |

### 机械工程

|                                               |                    |       |
|-----------------------------------------------|--------------------|-------|
| 基于 3DS MAX 和 Virtools 的胎带机支承装置虚拟仿真技术的研究 ..... | 韩林山, 马敬丽, 钟艺谋      | (92)  |
| 二甲醚均质充量与柴油喷射复合燃烧方式对发动机性能的影响 .....             | 孙志强, 金 阳, 段俊法, 李巧英 | (96)  |
| 直接造型法生成齿轮方法的改进 .....                          | 韩素兰, 袁丽娟           | (100) |
| 法向承力锚安装过程的动力研究 .....                          | 冯 倩, 孙克俐           | (102) |
| 基于 SolidCAM 的安装底座零件的数控仿真加工 .....              | 吴金妹, 彭 晗, 王亚辉, 王 娜 | (106) |
| 基于 LabVIEW 的温室大棚监测与控制系统设计 .....               | 谷宇希, 孟先新, 杨道华, 王丽君 | (110) |

### 基础理论研究

|                              |               |       |
|------------------------------|---------------|-------|
| 虚拟场景中的动态景物仿真 .....           | 刘雪梅, 朱齐亮, 张 楠 | (113) |
| 轻量级 RFID 中间件的设计与实现 .....     | 刘建华, 陈欢欢      | (117) |
| RFID 系统中的 CRC 算法的研究与设计 ..... | 陈 燕, 郭 锋      | (121) |
| 基于 PCA 的改进 SIFT 特征提取算法 ..... | 冯 博           | (125) |

基本参数: CN41-1249/TV \* 1980 \* b \* A4 \* 128 \* zh \* P \* ¥20.00 \* 1500 \* 35 \* 2013-06

执行编辑: 陈海涛 蔡洪涛 杜明侠 乔翠平 英文编辑: 乔翠平



**JOURNAL OF NORTH CHINA INSTITUTE OF WATER  
CONSERVANCY AND HYDROELECTRIC POWER**

Vol. 34 No. 3

(Started in 1980)

(Jun. 2013)

**CONTENTS**

Intelligent System Design of Hydraulic Flat Steel Gates Based on Inventor ..... WEI Qun, LIU Feng-lian, YIN Wei-bo(1)

Application of BIM Technology in Development of Three-dimensional Design Software for Hydraulic Flat Steel Gates ..... WEI Qun, WEI Lu-shuang, SUN Kai(5)

Fine Modeling of Finite Element Analysis of Steel Structure ..... WEI Qun, JIANG Hua(9)

Conversion of Three-dimensional CAD Graphics and Virtual Reality Files ..... LIU Shang-wei, ZHANG Shu-jun(13)

Application of Cloud Technology in Steel Structure Design Software ..... WEI Lu-shuang, LIU Shang-wei(16)

Establishment and Application of Digital Graphic Template Database of Hydraulic Flat Steel Gates ..... YIN Wei-bo, SUN Kai, WEI Lu-shuang(19)

Design Techniques of Common Steel Structure Junction Plate ..... ZHOU Lun-gang, GAOYANG Qiu-ye, WEI Qun(22)

Research on Automatic Drawing and Dimensioning of Hydraulic Flat Steel Gates by Inventor ..... YIN Wei-bo, JIN Li-hui, WEI Qun(25)

Development and Application of Dynamic Visual Simulation Software in the Process of Steel Structure Construction ..... JIANG Hua, TONG Liang, GAOYANG Qiu-ye(29)

Three-dimensional Fine Modeling of Large and Complex Steel Truss Bridges ..... JIANG Hua, PENG Yun-dong, YU Huan(33)

Research on Coordinate System Establishment and Conversion in 3D Software of Steel Structure ..... SUN Kai, WEI Lu-shuang, ZHOU Lun-gang(37)

Temporal and Spatial Variation Trend Analysis of Spring Drought in Gansu Province in Recent 48 Years ..... MA Jian-qin, HAN Xi(40)

Numerical Simulation and Experiment Research of Ice Blasting Based on Shaped Charge Technology ..... MENG Wen-yuan, LIU Xin, HU Jun-qiang(44)

Numerical Simulation Research of the Combination of Ice Blasting Based on Shaped Charge Technology ..... HU Jun-qiang, MENG Wen-yuan, LIU Xin(48)

Analysis of Spatial Scale Changes of Water and Sediment Characteristics in Jinghe Basin ..... CUI Xiao-hong, ZHOU Zu-hao, QIU Lin(51)

Simplified Algorithm for Calculating Water Depth at Vena Contraction in the Open Channel with Arc-bed Trapezoidal Section ..... TENG Kai, ZHANG Li-wei(55)

Main Parameters in Seepage-proofing Design of Zanggui Village Branch Canal in Xinjiang ..... TIAN Lin-gang, Nuermanguli · aierken, Abulimiti(59)

Application of Geographic Information System in Hydrology and Water Resources ..... ZHANG Hai-ting(63)

Research on Comprehensive Evaluation Method of Slope Treatment ..... ZHAO Er-ping, CAO Xiu-jun(67)

Dynamic Characteristics Research on Weak Expansive Soil of the Middle Route Project of South-to-North Water Transfer ..... ZHAN Chuan, LI Gang, LIU Ying-ying(70)

Application of Multi-station Registration of Point Clouds Data in Hydraulic Engineering Surveying and Mapping ..... ZHANG Yong-guang, LIU Hao-jie, YIN Xiao-lei, LIU Peng-jun(74)

Soil Profile Characteristics and Improvement Suggestions of Lime Concretion Black Soil in Henan Province ..... LIU Hai-yan, LI Yue-peng(78)

Simulation of Self-synchronous Parallel Based on MATLAB for Synchronous Motors ..... XU Qiang, CHEN Qiao-ling, HOU Yong-hui, QIAN Jun-liang, SONG Zhe(82)

Study on Reactive Current Detection Method of Distribution Static Synchronous Compensator ..... PING Zeng, ZHANG Zhong-feng, ZHANG Juan, ZHANG Hui, ZHANG Liang-xue(86)

Study on Energy-saving and Cost-reducing of Outdoor-equipment Production Line of Household Air Conditioners ..... YANG Bo, WANG Bao-hua, LI Yu-lei(90)

Research on Virtual Simulation Technology of Supporting Devices of Tire Belt Machines Based on 3DS MAX and Virttools ..... HAN Lin-shan, MA Jing-li, ZHONG Yi-mou(92)

Influences of Compound Combustion Mode of Dimethyl Ether Homogeneous Charge and Diesel Fuel Injection on Performances of Diesel Engine ..... SUN Zhi-qiang, JIN Yang, DUAN Jun-fa, LI Qiao-ying(96)

Improvement of Gear Modeling by Direct Modeling Method ..... HAN Su-lan, YUAN Li-juan(100)

Research on Dynamic Installation Model of Vertically Loaded Anchor ..... FENG Qian, SUN Ke-li(102)

Numerical Control Machining of Mounting Base Parts Based on SolidCAM ..... WU Jin-mei, PENG Han, WANG Ya-hui, WANG Na(106)

Design of Monitoring and Control System for Greenhouse Based on LabVIEW ..... GU Yu-xi, MENG Xian-xin, YANG Dao-hua, WANG Li-jun(110)

Dynamic Scenes Simulation in Virtual Environments ..... LIU Xue-mei, ZHU Qi-liang, ZHANG Nan(113)

Design and Realization of Lightweight RFID Middleware ..... LIU Jian-hua, CHEN Huan-huan(117)

Research and Design of CRC Algorithm in RFID System ..... CHEN Yan, GUO Feng(121)

Improved SIFT Feature Extraction Algorithm Based on PCA ..... FENG Bo(125)