

PROCEEDINGS OF SPIE

Fourth International Conference on Mechanical, Electronics, and Electrical and Automation Control (METMS 2024)

**Zeashan Hameed Khan
Junxing Zhang
Pengfei Zeng**
Editors

**26–28 January 2024
Xi'an, China**

Organized by
Jiangnan University (China)

Sponsored by
Xidian University (China)
AEIC Academic Exchange Information Centre (China)

Published by
SPIE

Volume 13163

Part One of Three Parts

Proceedings of SPIE 0277-786X, V. 13163

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *Fourth International Conference on Mechanical, Electronics, and Electrical and Automation Control (METMS 2024)*, edited by Zeashan Hameed Khan, Junxing Zhang, Pengfei Zeng, Proc. of SPIE 13163, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510679870

ISBN: 9781510679887 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2024 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

xxi Conference Committee

Part One

MECHANICAL DEVICE DESIGN AND STRUCTURAL OPTIMIZATION

13163 02	Attachment device and analysis of anti-fall device [13163-114]
13163 03	Design and verification of elongated load installation for a spacecraft [13163-166]
13163 04	Low inductance busbar design for three-phase interleaved parallel DC-DC converters [13163-170]
13163 05	Analysis of dry cutting technology based on green manufacturing [13163-212]
13163 06	Design and verification of self-adaptive control towing apparatus for ship model test [13163-243]
13163 07	Design of 25-32 GHz low noise amplifier in a 55nm CMOS silicon-on-insulator technology [13163-267]
13163 08	Design and finite element analysis of LNG cylinders [13163-79]
13163 09	Design and validation of industrial equipment based on MPC-PID control [13163-327]
13163 0A	Design and research of remote tower leg cutting device for transmission lines [13163-255]
13163 0B	Theory based on HMM and Bayesian analysis for predicting the remaining useful life of tools [13163-109]
13163 0C	Research of electrical discharge and electrochemical combined machining technology [13163-92]
13163 0D	Multi-objective optimization of cutting parameters for efficient and high-quality in milling gray cast iron HT250 [13163-48]
13163 0E	Research on an optimal method for designing planar four-bar mechanisms according to a predetermined trajectory [13163-285]
13163 0F	Design and implementation of a fiber optic gyro north finder [13163-260]
13163 0G	Design of data processing for integrated search and tracking radar [13163-398]

13163 OH	A DSP-based LCR meter design [13163-128]
13163 OI	Design and performance optimization of broadband millimeter-wave power amplifier based on 45nm SOI process [13163-124]
13163 OJ	Design of a fully automatic etherification production process control system for hydroxypropyl methyl cellulose [13163-231]
13163 OK	Design and research on wind balance system of vertical rod [13163-57]
13163 OL	Analysis of spherical detector in pipes with different inclination angles [13163-6]
13163 OM	Design and investigation of an airbag-free buffer throttle device [13163-106]
13163 ON	Optimization of conditioning performance parameters in ring die granulators [13163-148]
13163 OO	Structural design and dynamic simulation analysis of high precision spindle for ceramic ferrule grinder [13163-51]
13163 OP	Preparation device and measuring technology of test samples by coaxial transmission and reflection method [13163-122]
13163 OQ	Design of an interactive multifunctional teaching aid [13163-203]
13163 OR	Optimization of rapid power reduction (RPR) design for advanced pressurized water reactor [13163-161]
13163 OS	A CFRP drilling parameter optimization method considering progressive tool wear [13163-111]
13163 OT	Considering the probability evaluation of wind turbine output under multiple states [13163-380]
13163 OU	Design and research of a fully automatic tree planting machine mechanism [13163-367]
13163 OV	Modeling of instantaneous uncut chip thickness in 5-AXIS flank milling considering cutter runout [13163-94]
13163 OW	Structure design and analysis of ditching device for ecological grass truck [13163-177]
13163 OX	Structural design of bag opening mechanical claw based on finite element simulation [13163-11]
13163 OY	Design of intelligent bracelet based on Beidou positioning [13163-288]
13163 OZ	Structural optimization design of one-piece snake bone [13163-35]
13163 IO	Design of a hysteresis comparator with temperature compensation [13163-361]

- 13163 11 **Mechanical structure design and motion simulation of bird-like flapping wing aircraft**
[13163-133]
- 13163 12 **Research on design and performance of skeleton type soft actuator** [13163-44]
- 13163 13 **Mechanical structure design and simulation of multi-physical field integrated pipeline internal inspection detector** [13163-319]
- 13163 14 **A novel seam extraction method based on nearest point for non-groove butt weld seam**
[13163-90]
- 13163 15 **Optimization design and analysis of transmission device for impact simulation test of special machinery** [13163-343]
- 13163 16 **Simulation and optimization design of radar protection device based on genetic algorithm**
[13163-366]
- 13163 17 **Design of flood prevention and intelligent inspection smart well covers** [13163-345]
- 13163 18 **Structural resonance analysis and treatment of large thermal power unit vertical condensate pump variable frequency operation** [13163-192]
- 13163 19 **Design and simulation of a new ultra-high voltage UAV contact grounding wire device**
[13163-354]
- 13163 1A **The design of image low-pass filter ASIC architecture based on stochastic computing**
[13163-188]
- 13163 1B **Research and design of the gravity unloading device for circular solar arrays** [13163-81]
- 13163 1C **Design of PID controller for robot arm based on genetic algorithm and fuzzy theory** [13163-93]
- 13163 1D **Optimization algorithm for deep hole milling parameters of nickel-based alloys based on deep learning** [13163-37]
- 13163 1E **Research on mechanical structure optimization based on topology structure** [13163-312]
- 13163 1F **Analysis of fracture failures and structural improvement of a launcher frame** [13163-126]
- 13163 1G **Design and analysis of the bionic energy-absorption thin-wall tube under axial dynamic loading** [13163-273]
- 13163 1H **Two-dimensional phononic crystal thin-plate embedded structure for vibration and noise reduction** [13163-291]
- 13163 1I **Design of a clamping mechanism with self-buffering, self-locking, and large opening and closing angles** [13163-249]
- 13163 1J **Optimization and vibration analysis of the supporting structure of the guide cover of grapevine burying machine** [13163-120]

MECHANICAL DYNAMICS AND THERMAL PHYSICS RESEARCH

13163 1K	Study on multi-body dynamics of roller enveloping hourglass worm gear [13163-65]
13163 1L	CGA-based approach for direct kinematics of a novel reconfigurable parallel mechanism [13163-232]
13163 1M	Dynamic model analysis of a miniature robotic fish and its motion control based on integrated sensors [13163-50]
13163 1N	Research and application of numerical fatigue wear equipment with load [13163-300]
13163 1O	Impact of geometrical parameters of ultrasonic-assisted grinding diamond tool on outlet stress and edge collapse of glass-ceramics [13163-105]
13163 1P	Influence of thermocouple bead shape and position on temperature measurement [13163-168]
13163 1Q	Kinematics and dynamics of a novel SCARA parallel mechanism actuated by prismatic pair [13163-103]
13163 1R	A correction method for steady temperature measurement with dual thermocouples [13163-272]
13163 1S	1D numerical correction for temperature measurement with inclined thermocouples [13163-270]
13163 1T	Research on dynamic characteristics of mining two-stage planetary gear train considering with eccentricity fault [13163-157]
13163 1U	Effect of double winding on loss characteristics of narrow stacked superconducting coils [13163-54]
13163 1V	A novel gas-liquid linkage boosting device for enhanced performance of natural gas pipeline actuators [13163-331]
13163 1W	Dynamic simulation and control strategy of fuel gas supply system for LNG-fueled ships [13163-349]
13163 1X	Dynamic balance of Jeffcott warped rotor [13163-389]
13163 1Y	Defect detection of solar cells based on improved YOLOv5s [13163-20]
13163 1Z	Integrated research on power grid regulation and medium frequency heating furnace control technology [13163-115]
13163 20	Predictive energy management of fuel cell vehicle based on global driving condition construction [13163-314]
13163 21	Research on the estimation of SF₆ gas recovery rate based on kNN-ICHOA-KELM [13163-252]

13163 22	Research on mechanical vibration of high-speed railway pantograph system based on DMC strategy [13163-52]
13163 23	Enhanced thermoelectric performance of SmS by Se alloying and Y doping [13163-334]
13163 24	Research on bulldozing effect and adhesion performance model of track shoe [13163-357]
13163 25	Stress analysis of a new type of cylindrical gear with circular arc tooth trace [13163-182]
13163 26	Simulation study on combustion characteristics of different fuels in SI engine [13163-236]
13163 27	Research on resilient wheel sluggish movement of light rail transit [13163-184]
13163 28	A comparative study of combined surrogate models and evolutionary algorithms for ship resistance optimization [13163-101]
13163 29	Research on Pearson correlation and improved CNN-LSTM algorithm for predicting photovoltaic power generation [13163-66]
13163 2A	Energy management strategy for a hybrid tug based on explicit model predictive control [13163-205]
13163 2B	Study on aerodynamic performance of outlet pipe of ram air system [13163-73]
13163 2C	Sensitivity analysis and prevention of resonance response of centrifugal pump structure [13163-233]
13163 2D	Electromagnetic force analysis of permanent magnet synchronous motors based on rotor magnetic barrier structure optimization [13163-83]
13163 2E	Hybrid optimization of photovoltaic power prediction with PSO-CNN-GRU considering seasonal partitioning [13163-4]
13163 2F	Numerical simulation method for thickness optimization of perovskite/silicon tandem solar cells [13163-62]
13163 2G	Optimization of aerodynamic acoustics in the pipe with variable cross-sections [13163-149]
13163 2H	Identifying dissolved gas characteristic parameters in transformer oil based on trapezoidal model [13163-362]
13163 2I	Research on miniaturized power transmission system of ROV [13163-206]
13163 2J	Leakage and deformation characteristics of the main spool of a deep-sea relief valve [13163-222]
13163 2K	A prediction method for convective heat transfer coefficients of brake discs based on small samples combined wind tunnel tests and CFD simulations [13163-13]

13163 2L	Influence of inclusions in train wheels and service life prediction [13163-84]
13163 2M	Environmentally friendly gas-insulated switchgear system design and heat dissipation analysis [13163-277]
13163 2N	Modeling and simulation of fuel cell thermal management system for forklift [13163-211]
13163 2O	Study on the relationship between dynamic energy utilization of power plant in extremely cold environment [13163-71]
13163 2P	Life prediction model for turbofan engines based on XGBoost [13163-39]
13163 2Q	Study on kinematic characteristics of SMA bionic flexible dexterous hand [13163-210]
13163 2R	Study on the wind resistance of a certain commercial vehicle and its influence on fuel consumption [13163-134]
13163 2S	Simulation analysis of heat dissipation of the inner cavity of closed electronic equipment based on Icepak [13163-324]
13163 2T	Optimize VMD-LSTM photovoltaic force combination prediction model based on SSA parameter optimization [13163-332]
13163 2U	Implementing the EHFE-Gebhart model for efficient spacecraft uncertainty thermal analysis [13163-60]
13163 2V	Simulation study on circulating water system of 300 mw steam turbine unit [13163-220]
13163 2W	Distributed scheduling for electric and heat supply system of friendly smart community [13163-31]
13163 2X	Optimization of hybrid electric vehicle energy management strategy based on dynamic programming [13163-108]
13163 2Y	Comparative analysis of air-assisted injection diesel and kerosene spray characteristic [13163-294]
13163 2Z	Research on flow resistance calculation of propellant management device for aerospace surface tension tank [13163-317]
13163 30	Energy management and speed optimization of diesel-electric hybrid ships considering meteorological uncertainties [13163-196]
13163 31	Boost voltage control in hybrid vehicles [13163-75]
13163 32	Study on energy consumption optimization of polysilicon reduction furnace [13163-381]
13163 33	Performance evaluation of multi vortex hydraulic drag reduction tools based on Coanda effect [13163-123]

Part Two

INTEGRATED CIRCUIT SIMULATION AND VOLTAGE ANALYSIS

- 13163 34 **Defect detection of voltmeter in distributed electricity room based on improved deformable DETR** [13163-139]
- 13163 35 **Sag measurement method of overhead transmission line based on image processing technology** [13163-102]
- 13163 36 **Image-based fall detection of the operation and maintenance personnel in the deep foundation pit of the power transmission lines** [13163-358]
- 13163 37 **Development of a new type of 110kV inverted environmentally friendly current transformer and analysis of measurement accuracy test** [13163-391]
- 13163 38 **An improved current comparator with digital feedback** [13163-360]
- 13163 39 **A method for selecting crossline two point sequential grounding fault lines for reliability enhancement** [13163-3]
- 13163 3A **Optimization of underground power pipeline laying route based on conditional constrained A-star algorithm** [13163-356]
- 13163 3B **Design on overvoltage protection circuit for automotive power switching MOSFET** [13163-7]
- 13163 3C **State monitoring method of automation equipment in independent and controllable substation based on grey prediction model** [13163-377]
- 13163 3D **Research on inverse modeling method of transmission line GIM model based on laser point cloud and image feature extraction** [13163-305]
- 13163 3E **Exploring MCR+ technology in reactive power management and voltage control in power grids** [13163-23]
- 13163 3F **Research on on-line monitoring method for losses of distribution transformer in the case of single-phase grounding condition** [13163-344]
- 13163 3G **High load balancing scheduling method of power system based on multi-objective genetic algorithm** [13163-30]
- 13163 3H **Design of LDO circuit with low noise and high PSRR** [13163-195]
- 13163 3I **Numerical simulation of stray current corrosion of buried steel pipelines** [13163-199]
- 13163 3J **Research and simulation of wireless charging coupling structure** [13163-158]
- 13163 3K **A short-term wind power prediction method based on wind speed correction and spatial data enhancement** [13163-85]

13163 3L	Transmission rights allocation mechanism adapted to multi-level power market [13163-282]
13163 3M	Fall detection of personnel working in deep pits of power transmission lines based on human pose estimation and transformer [13163-172]
13163 3N	Research on cable selection in low voltage distribution systems affected by harmonics [13163-155]
13163 3O	Detection of insulator defects based on improved YOLOv7 method [13163-316]
13163 3P	A short-term wind power probability prediction method based on soft clustering and similarity measurement [13163-242]
13163 3Q	Enhancing output performance of triboelectric nanogenerator by suppressing surface flashover of the dielectric layer [13163-100]
13163 3R	3D state fitting and optimization of transmission line based on GIM model [13163-397]
13163 3S	Research on the impact of low frequency transmission technology on the AC limit access distance of offshore wind farms [13163-374]
13163 3T	Research on grid-forming energy storage control and its application in high voltage system [13163-292]
13163 3U	Analysis and fault location of single-pole ground fault in LVDC ungrounded system [13163-271]
13163 3V	Research and analysis of automotive electronic and electrical architecture based on PREvision [13163-140]
13163 3W	Fatigue life analysis of air conditioning compressor-piping system based on Miner damage accumulation theory with acceleration factor [13163-258]
13163 3X	Energy extraction from high-voltage line based on AC field coupling [13163-146]
13163 3Y	Research on electromagnetic immunity testing method for brake systems based on intelligent algorithms [13163-25]
13163 3Z	A multi-channel pneumatic servo positive or negative pressure integrated console for structural strength air tightness test [13163-396]
13163 40	A three-dimensional dynamic modeling method for substation GIS equipment based on improved Res-BiGRU model [13163-117]
13163 41	Condition monitoring of disconnecting switch opening and closing motor based on electromagnetic transient [13163-238]
13163 42	Research on using energy storage devices to enhance the limit access distance of AC access for offshore wind farms [13163-372]
13163 43	Current reconstruction sensorless FOC control system based on brushless hub motor [13163-42]

- 13163 44 **Research on dynamic monitoring and analysis technology for key parameters of port lifting machinery** [13163-194]
- 13163 45 **Voltage inertia control method for AC/DC interconnection transformation interaction process** [13163-390]
- 13163 46 **Calibrating precise AC voltage meter using AC quantum voltages** [13163-353]
- 13163 47 **4-20mA constant current source based on PID control** [13163-228]
- 13163 48 **Research and analysis on insulation tolerance level and MOV setting principles of electrical equipment in 1000kV substation** [13163-144]
- 13163 49 **Design of electrical primary section of 220kV substation in Tiexi District, Haicheng City** [13163-297]
- 13163 4A **Research on active distribution network substation area acquisition and control** [13163-28]
- 13163 4B **Research on the construction method of digital twin model for transmission line icing** [13163-309]
- 13163 4C **Classification and comprehensive treatment for the voltage deviation of the distribution transformer connected with the distributed photovoltaic connection** [13163-321]
- 13163 4D **Portable three-electrode circuit for electrochemical micro-sensors** [13163-179]
- 13163 4E **Research on control method of loop to power supply in active distribution network based on optimal frequency method** [13163-215]
- 13163 4F **The fault identification method of high energy-consuming transformer interturn short circuit considering feature coupling** [13163-15]
- 13163 4G **A method of distributed parallel compensation for low voltage management in power distribution network** [13163-137]
- 13163 4H **Simulation of the surface current density with conductors** [13163-330]
- 13163 4I **An evaluation method of wildfire risk in transmission lines based on TOPSIS and cloud model** [13163-27]
- 13163 4J **Relay coil-based long-range RFID reader/writer for ISO15693 identification** [13163-74]
- 13163 4K **A transmission line selection algorithm for airport surrounding power grid based on information fusion model and Dijkstra algorithm** [13163-221]
- 13163 4L **Modeling of transformer oil-paper insulation deterioration based on improved Wiener model** [13163-169]
- 13163 4M **Construction of a real-time analysis model for abnormal electrical energy data based on demand-side dynamic response** [13163-26]

- 13163 4N **Life prediction of railway relays based on XGboost-informer model** [13163-38]
- 13163 4O **Research on optimization of reactive power control in photovoltaic power plant** [13163-241]

GRID SCHEDULING AND COMMUNICATION DATA PROCESSING

- 13163 4P **Prediction of the lowest system frequency when disturbance occurs based on power deficit estimation** [13163-178]
- 13163 4Q **Research on LVDT signal conditioning circuit based on STM32** [13163-59]
- 13163 4R **Research on multi-source distribution network data management method based on StarRocks** [13163-323]
- 13163 4S **Reliability evaluation of microgrid information physical system based on stochastic matrix theory** [13163-264]
- 13163 4T **Optimization scheduling strategy of microgrid system based on multi-agent system** [13163-263]
- 13163 4U **Analysis of the application of filter algorithm in indoor fingerprinting localization** [13163-142]
- 13163 4V **Research on frequency doubling technology for night vision cameras** [13163-156]
- 13163 4W **Optimal configuration of energy storage capacity in microgrid based on improved grey wolf optimizer algorithm** [13163-68]
- 13163 4X **Reactive power optimization of distribution network with DG based on improved whale optimization algorithm** [13163-171]
- 13163 4Y **Harmonic coupling characteristic analysis based on HSS and comparison of harmonic source identification methods** [13163-99]
- 13163 4Z **Tunnel intelligent energy-saving system based on millimeter wave radar detection** [13163-110]
- 13163 50 **The impact of energy system transformation on the efficiency of China's power grid** [13163-235]
- 13163 51 **GIC prediction for power grid based on ICEEMDAN-CNN-LSTM optimized by improved sparrow search algorithm** [13163-8]
- 13163 52 **Multi source coordinated control strategy for electric hydrogen coupling isolated DC microgrid** [13163-5]
- 13163 53 **Analysis of emission reduction potential of power grid engineering based on LEAP modelling** [13163-301]
- 13163 54 **Ultrasort-term power prediction researched by LSTM memory neural networks based on partial least squares dimensionality reduction** [13163-154]

- 13163 55 **A method for measuring the normal acoustic energy flux based on radially polarized transducers** [13163-311]
- 13163 56 **Research on natural language understanding model for power marketing strategies** [13163-310]
- 13163 57 **An automatic reclosing method based on topology identification in active distribution networks** [13163-293]
- 13163 58 **Research on power quality of county-level distribution networks under high penetration of distributed renewable energy sources** [13163-136]
- 13163 59 **MMC circulation suppression strategy based on improved PIR with notch filter** [13163-145]
- 13163 5A **Research on filtering method of helicopter overload signal based on wavelet transform** [13163-388]
- 13163 5B **Task offloading and cross-layer resource allocation for mobile edge computing in NOMA multimode communication** [13163-190]
- 13163 5C **An iterative method for short-wave source localization based on constrained weighted least squares** [13163-219]
- 13163 5D **A state detection method for high voltage distribution network equipment based on improved YOLOv5** [13163-315]
- 13163 5E **Nacelle lidar wind speed prediction under spatial-temporal correlation** [13163-61]
- 13163 5F **Research on substation flood forecasting model with spatio-temporal attention radar echo feature identification** [13163-299]
- 13163 5G **Failure mechanism analysis of wedge lock in airborne electronic equipment** [13163-223]
- 13163 5H **High-precision positioning algorithm for live construction in substations based on Beidou high-precision differential positioning** [13163-132]
- 13163 5I **Prediction method of output power of new energy distribution network based on improved BP neural network** [13163-147]
- 13163 5J **Short-term traffic flow prediction based on combination of SSA and LSTM** [13163-67]
- 13163 5K **Integrated energy and incremental distribution network integration planning** [13163-80]
- 13163 5L **Image super-resolution reconstruction based on NEDI constraints** [13163-376]
- 13163 5M **Fed-frenemy: robust screening of compromised clients, balancing heterogeneity** [13163-335]
- 13163 5N **Research on the influence of hydraulic motor on the performance of radar leveling leg** [13163-338]

13163 5O	Research on distributed fault self-healing technology of medium voltage distribution network under complex power supply topology [13163-239]
13163 5P	Finite element simulation analysis of impact signal generation under different conditions [13163-201]
13163 5Q	Extraction of parameters of ballistic targets based on angle doppler and line doppler [13163-10]
13163 5R	Optimization strategy of signal timing at level crossing based on real-time queue length [13163-14]
13163 5S	Research on signal equalization technology of visible light communication system [13163-107]
13163 5T	Design of UHF RFID verification system based on software-defined radio [13163-246]
13163 5U	Research on security classification for proximity networks with radio access network [13163-278]
13163 5V	High-precision indoor location algorithm based on broadband channel [13163-247]
13163 5W	Implementation of a wristwatch for dose measurement based on CsI detector [13163-121]
13163 5X	A freight yard train and commercial vehicle based on DGPS/radar ranging/laser ranging combination application [13163-150]
13163 5Y	Multi-attribute information security exchange platform of computer network based on ElGamal [13163-208]
13163 5Z	Optimization application of Canny algorithm in gear image edge detection [13163-284]
13163 60	Key exchange algorithm for authentication protocol of heterogeneous power communication network with joint variable weight [13163-276]
13163 61	A novel kind of antenna array with low dielectric constant [13163-296]
13163 62	Implementation method of MATLAB data processing in radar antenna pattern testing [13163-392]
13163 63	A method for identifying key features of network security situation based on decision tree algorithm [13163-279]
13163 64	Key cooperative operation and maintenance method of quantum communication network between multi-layer structured power grids [13163-289]
13163 65	Intelligent monitoring of malicious intrusion behavior for power communication network channel [13163-240]
13163 66	Numerical simulation of cavitation flow field in Venturi tube [13163-307]

- 13163 67 **Prediction of shield tunnelling parameters based on temporal convolutional network** [13163-34]
- 13163 68 **Error analysis study of 3D laser scanning technology in large space grid structure measurement**
[13163-36]

Part Three

INTELLIGENT SYSTEM PLANNING AND AUTOMATION CONTROL

- 13163 69 **Synchronization control algorithm model and control strategy for robotic arm based on deviation coupling** [13163-224]
- 13163 6A **Development and implementation of an online analysis platform for sub/ultra synchronous oscillations** [13163-350]
- 13163 6B **Research on digital active EMI filter based on repetitive control** [13163-281]
- 13163 6C **Automatic obstacle avoidance system based on DWA combined with A-star algorithm**
[13163-322]
- 13163 6D **Electrofused magnesium furnace electrode lifting automatic control system design** [13163-186]
- 13163 6E **Study on the aging diagnosis of oil-paper insulation based on ultrasonic time-frequency characteristics** [13163-378]
- 13163 6F **Modeling and simulation of attitude control of quadrotor UAV based on small disturbance interference** [13163-337]
- 13163 6G **Design of hydraulic system of folding metal plate based on AMESim** [13163-318]
- 13163 6H **Research on the application of LRM modules in launch vehicle test and launch control system**
[13163-348]
- 13163 6I **Acoustic absorption tube terminal design optimized based on COMSOL** [13163-382]
- 13163 6J **Fault analysis and calculation of high voltage auxiliary power system in solar thermal power station** [13163-9]
- 13163 6K **Research on auxiliary positioning methods for automatic control of urban rail transit trains**
[13163-370]
- 13163 6L **Miniature energy harvesting system based on piezoelectric effect** [13163-227]
- 13163 6M **Investigation of a cloud platform-based control system for an integrated water and fertilizer machine** [13163-371]
- 13163 6N **Research on efficiency optimization control technology for distributed interleaved parallel power supply systems** [13163-17]

13163 6O	Design of adaptive projection interactive system for automotive headlights based on STM32 and DLP [13163-29]
13163 6P	Design of laser assisted heating 3D printing control system [13163-138]
13163 6Q	Intelligent fault diagnosis of rolling bearings based on MDF and Swin Transformer [13163-302]
13163 6R	Design for the active arm system in automotive collision-test dummies [13163-76]
13163 6S	Dental implant positioning leveraging self-identifying projective invariant markers [13163-244]
13163 6T	Groundwater in situ heavy metal detection intelligent induction micro-accuracy injection device based on STM32 [13163-207]
13163 6U	Transmission line inspection system based on high performance unmanned helicopters [13163-339]
13163 6V	Modeling and anti-sway control of boom cranes [13163-187]
13163 6W	Dynamic characterization of intelligent warehousing system for load shifting process [13163-383]
13163 6X	Design of double chamber lime vertical kiln system based on programmable controller [13163-286]
13163 6Y	Development of servo electro-hydraulic control system for heavy-duty horizontal extruder [13163-160]
13163 6Z	Short circuit ratio analysis and voltage stability control of power system with DFIG-based wind turbines [13163-218]
13163 70	Fixed-wing model for aircraft flight control auto-stabilization system [13163-175]
13163 71	Detection of the rail bolt loosening based on nonlinear ultrasonic [13163-21]
13163 72	Edge-cloud collaborative multi-level fault diagnosis based on stacked sparse autoencoder [13163-162]
13163 73	Research on fault diagnosis of porcelain pillar insulators based on vibration signal feature extraction [13163-259]
13163 74	Exploration of CNC programming techniques for the 840Dsl system [13163-47]
13163 75	Diagnosis of local demagnetization faults in PMSM based on CWT and radial leakage magnetic flux [13163-19]
13163 76	Design of pulse laser power supply control system based on STM32 [13163-125]

- 13163 77 **CVT error evaluation method based on moving window-weighted principal component analysis [13163-174]**
- 13163 78 **Study on the tip flow control effect of pump jet propeller with groove structure [13163-104]**
- 13163 79 **Virtual synchronous generator control strategy based on improved cuckoo search algorithm [13163-16]**
- 13163 7A **Potential fault identification of intelligent pulping equipment based on user behavior analysis [13163-129]**
- 13163 7B **Design of electrical control system for rice processing based on PLC [13163-191]**
- 13163 7C **Fuzzy control of permanent magnet synchronous motor for new energy vehicle based on MFO algorithm [13163-326]**
- 13163 7D **Optimization study of multi-motor power balance control [13163-135]**
- 13163 7E **Intelligent fault diagnosis system based on gear mechanism [13163-214]**
- 13163 7F **Study of the shift process of a hydrodynamic automatic transmission considering the vehicle driveline system [13163-96]**
- 13163 7G **Optimal algorithm investigation of multi-axis vibration control based on PXI bus technology [13163-283]**
- 13163 7H **A scenario mining method and statistical analysis of driving behavior characteristics of vehicle negotiating a curve based on a data-driven approach [13163-198]**
- 13163 7I **An improved adaptive minimum entropy deconvolution method in bearing fault detection [13163-306]**
- 13163 7J **Research on PMSM sensorless control based on EKF [13163-33]**
- 13163 7K **Methods and applications of active noise control for vehicles under various operating conditions [13163-78]**
- 13163 7L **Suricata-based SOME/IP intrusion detection system design and implementation [13163-340]**
- 13163 7M **BFOP3D: binocular feature based occluded pedestrian 3D detection [13163-379]**
- 13163 7N **Offset optimization algorithm in coordinated control for near saturation arteries intersections [13163-56]**
- 13163 7O **Improved slide session border controlling and parallel multi-actuator servo loading for high energy loading process of trailing edge flap in aircraft high density energy systems [13163-341]**

- 13163 7P **An explicitation modelling-based true time simulating system for planetary rover** [13163-40]
- 13163 7Q **An automatic monitoring data filtering method for enhancing the reliability of steel sheet pile support systems** [13163-32]

INTELLIGENT ELECTROMECHANICAL MEASUREMENT AND CONTROL AND ROBOT MODELING

- 13163 7R **Research on intelligent CNC programming technology of tool electrode in EDM machining** [13163-250]
- 13163 7S **Weld seam tracking for TIG welding of stainless-steel pipes based on machine vision** [13163-229]
- 13163 7T **Research on the application of BIT technology in the test and launch control system of new generation launch vehicle** [13163-346]
- 13163 7U **Study of novel chip-level electric propulsion structure based on gem structure** [13163-70]
- 13163 7V **Dynamic properties of double fed induction generator wind turbine gearbox under low voltage ride through conditions** [13163-230]
- 13163 7W **Numerical simulation of aerodynamic characteristics of butterfly-like flapping wing aircraft based on Ansys Fluent** [13163-91]
- 13163 7X **Research on GIS partial discharge live detection assistant robot arm based on intelligent perception** [13163-77]
- 13163 7Y **Research on weld inspection of dissimilar thickness JSC590R/JAC980YL steel using electromagnetic ultrasonics** [13163-365]
- 13163 7Z **Characteristic analysis and optimization of modified rotary transformer** [13163-64]
- 13163 80 **Trajectory tracking control for autonomous underwater vehicle (AUV) with uncertainties** [13163-328]
- 13163 81 **Design and research of a multifunctional intelligent agricultural robot** [13163-141]
- 13163 82 **Research on obstacle avoidance algorithm for wheeled robot based on Raspberry Pi** [13163-176]
- 13163 83 **Asynchronous vibration characteristics of the rotor-seal system** [13163-336]
- 13163 84 **Research on three-dimensional path planning of UAV-AGV cooperative electric power patrol based on improved firefly algorithm** [13163-245]
- 13163 85 **Simulation analysis of dual-motor driven two-finger mechanical claw based on SOLIDWORKS Simulation** [13163-130]

13163 86	Induction motor without speed sensor flux-weakening control [13163-18]
13163 87	Application of machine vision in the production of metal seal gaskets [13163-313]
13163 88	Study on the rubbing behavior of rotor blade-casing system based on fluid-thermal-solid coupling [13163-72]
13163 89	Experimental study on the charging and discharging module of new energy vehicles [13163-53]
13163 8A	Performance simulation experiment analysis of extended range electric vehicles [13163-173]
13163 8B	Simulation analysis of the multifunctional loading and unloading machine [13163-375]
13163 8C	Finite element analysis of claw worm pair of climbing robot based on workbench [13163-373]
13163 8D	Strength and contact modal analysis of aerospace bevel gears [13163-298]
13163 8E	Finite element analysis of tripod-ball type universal coupling composite transmission shaft system [13163-355]
13163 8F	Research on simulated visual control of robotic arm in ROS environment [13163-342]
13163 8G	Monitoring method for the posture of a double-column horizontal rotating isolation switch [13163-234]
13163 8H	Prediction method of modal properties for single crystal blade with arbitrary crystal orientation [13163-351]
13163 8I	Simulation of complex surface driving performance of all-terrain walking mechanism [13163-69]
13163 8J	Trajectory planning of robotic arm based on improved RRT method [13163-113]
13163 8K	Study on optimized transportation in supply chain of China photovoltaic industry [13163-256]
13163 8L	A high gain operational amplifier based on current-reuse structure [13163-363]
13163 8M	Design and implementation of wall climbing robot for surface coating repair based on permanent magnet adsorption [13163-181]
13163 8N	An unmanned aerial vehicle path planning method under consideration of transmission line state assessment [13163-384]
13163 8O	Design of delay compensation system for visual tracking control of industrial robots [13163-320]
13163 8P	Object detection based on improved RT-DETR for human-robot collaboration manufacturing system [13163-12]

13163 8Q	Research on stamping line technology development and its intelligent theory [13163-262]
13163 8R	Contrastive research on peak regulation performance of different types of energy storage resources under multi-station integration scenario [13163-151]
13163 8S	A 2.35GHz CMOS LC-VCO with high linearity of frequency tuning by using PMOS varactors in AI chip [13163-261]
13163 8T	Development and application of RBI and NDT technology for large ethylene plant [13163-88]
13163 8U	Research on the path planning method for a robot cluster in emergency monitoring of environmental emergencies [13163-112]
13163 8V	Routing optimization for wind farm transport vehicles based on time-space network [13163-95]
13163 8W	Research on smart household gateway based on cloud-edge collaboration [13163-364]
13163 8X	Design and simulation study of multi-dimensional mobile robot under heavy duty working conditions [13163-359]
13163 8Y	Layered media parameters inversion algorithm based on adaptive sparse decomposition [13163-183]
13163 8Z	Intersection vehicle detection technology based on DeepSORT algorithm [13163-45]
13163 90	Abnormal evolution identification method of material supply chain node relationship based on deep learning [13163-153]
13163 91	A novel trajectory planning method for meal-assistance robot-based interpolation [13163-257]
13163 92	Visual-based feeding intention recognition for feeding robots [13163-248]
13163 93	Measurement and analysis of external acoustic radiation characteristics of C919 aircraft [13163-180]
13163 94	Matching and optimization of a pure electric vehicle transmission system equipped with a continuously variable transmission gearbox [13163-163]
13163 95	Application of amorphous magnetic rings in radiation emission testing [13163-304]
13163 96	Component-cluster-association analysis method for quality change and degradation of domestic aerospace components [13163-167]
13163 97	The simulation study on a mechanical test of marine electronic cabinet [13163-89]