

PROCEEDINGS OF SPIE

# ***International Conference on Smart Transportation and City Engineering (STCE 2023)***

**Miroslava Mikusova**

*Editor*

**16–18 December 2023**

**Chongqing, China**

*Organized by*

Chongqing Jiaotong University (China)

National Key Laboratory of Bridge Engineering Safety and Resilience (China)

*Sponsored by*

Hunan University (China)

State Key Laboratory of Mountain Bridge and Tunnel Engineering (China)

Beijing University of Technology (China)

China Merchants Chongqing Communications Technology Research and Design Institute Co., Ltd.  
(China)

AEIC—Academic Exchange Information Centre (China)

*Published by*

SPIE

**Volume 13018**

Proceedings of SPIE 0277-786X, V. 13018

**Part One of Two Parts**

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](http://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 *International Conference on Smart Transportation and City Engineering (STCE 2023)*, edited by Miroslava Mikusova, Proc. of SPIE 13018, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510673540

ISBN: 9781510673557 (electronic)

Published by

**SPIE**

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

Telephone +1 360 676 3290 (Pacific Time)

[SPIE.org](http://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](http://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](http://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

xv *Conference Committee*

## Part One

---

### TRANSPORTATION NETWORK MODELING AND VEHICLE CONTROL

---

- 13018 02 **The dynamic effect of smart transportation on the carbon emission of transportation industry based on PVAR model [13018-137]**
- 13018 03 **Modeling urban rail transit route choice with comprehensive travel cost [13018-171]**
- 13018 04 **Analysis of the interaction between driving intention and vehicle behavior based on driving simulation experiments [13018-220]**
- 13018 05 **The guiding mechanism of deceleration markings in uncontrolled pedestrian crosswalk areas for drivers [13018-219]**
- 13018 06 **Research on transfer discount for public transportation based on deep reinforcement learning and game theory [13018-149]**
- 13018 07 **Evolutionary game analysis of new energy vehicle battery swapping station construction in China under low-carbon policies [13018-26]**
- 13018 08 **Analysis of carbon emission distribution characteristics of the bus stop area in the net-connected environment [13018-187]**
- 13018 09 **Traffic mode recognition based on optimized temporal convolutional neural network by using cell phone GPS data [13018-58]**
- 13018 0A **Influencing factors of crosswind environment on vehicle running safety and analysis of driving stability [13018-70]**
- 13018 0B **Research on the spatio-temporal evolution pattern of traffic dominance in Shaanxi Province [13018-18]**
- 13018 0C **Analysis of the factors influencing the severity of straight-left conflicts under left turn permit phase [13018-131]**
- 13018 0D **Identification of key road sections based on mobility reliability of road network [13018-46]**
- 13018 0E **Assessment of the impact of forward vision on vehicle start-stop process and traffic operation [13018-83]**

- 13018 0F **Research on energy-saving driving recognition and optimization model development based on driving road conditions and driving styles** [13018-204]
- 13018 0G **Traffic influence analysis of the area adjacent accident point on freeway in connected environment** [13018-23]
- 13018 0H **The design of distributed photovoltaic charging station for electric vehicles** [13018-142]
- 13018 0I **High speed train optimal adhesion control method based on a Cubature Kalman filter** [13018-5]
- 13018 0J **Simulation study of ship traffic flow in two-way narrow channel considering channel risk** [13018-227]
- 13018 0K **Design and research on passenger flow monitoring system of integrated transport hub based on big data** [13018-123]
- 13018 0L **Analysis on the applicability of typical railway vehicle in intermodal transport** [13018-128]
- 13018 0M **Object detection for traffic management based on YOLO** [13018-97]
- 13018 0N **Autonomous driving hazard scenario extraction and safety assessment based on crash reports and Carla simulation** [13018-179]
- 13018 0O **Analysis and research on the development statuses and trends of intelligent connected transportation** [13018-84]
- 13018 0P **Research on optimal train adhesion control based on nonlinear model predictive control** [13018-122]
- 13018 0Q **Study on the planning of electric vehicle fast charging facilities considering path selection behavior** [13018-45]
- 13018 0R **A car following model considering driver memory effect in intelligent transportation environment** [13018-56]
- 13018 0S **Charging route selection model of electric vehicles considering user perception** [13018-214]
- 13018 0T **Research on the characteristics of mixed traffic flow in an intelligent connected environment** [13018-244]
- 13018 0U **Analysis of mixed traffic flow safety at the exit ramp of freeway** [13018-133]
- 13018 0V **Intelligent connected vehicle health monitoring system based on pulse diagnosis technology** [13018-90]
- 13018 0W **Dynamic characteristics of mixed traffic flow in ramp merging area under connected and automated environment** [13018-81]
- 13018 0X **Influence of travel dynamics parameters on high-altitude emission characteristics of GDI light-duty vehicles** [13018-19]

- 13018 0Y **Review of research on vehicle routing problems** [13018-166]
- 13018 0Z **Traffic flow prediction based on temporal multigraph convolutional neural network** [13018-186]
- 13018 10 **Complex characteristics and robustness analysis of urban rail transit network** [13018-115]
- 13018 11 **Unmanned surface vehicles path planning based on improved PRM algorithm** [13018-78]
- 13018 12 **Nighttime lane detection and vehicle position determination based on OpenCV** [13018-37]
- 13018 13 **Spatial-temporal distribution characteristics and traceability analysis of NOx emission from vehicles based on real-time automatic vehicle identification data in Guangzhou, China** [13018-175]
- 13018 14 **Research on global path planning of unmanned surface vehicles based on improved A\* algorithm** [13018-113]
- 13018 15 **A planning method for highways charging piles based on dynamic traffic simulation** [13018-196]
- 13018 16 **Traffic flow prediction model based on variational modal decomposition and Transformer** [13018-27]
- 13018 17 **Traffic flow prediction based on graph wave adaptive spatiotemporal graph convolution network** [13018-201]

---

#### INTELLIGENT LOGISTICS AND TRANSPORTATION SYSTEM PLANNING

- 13018 18 **Multi-objective optimization based on vehicle lane change** [13018-231]
- 13018 19 **A rapid solution method for surface unmanned vessels motion planning problem based on optimal control** [13018-245]
- 13018 1A **Short-time traffic flow prediction based on GRA-SLSTM model** [13018-180]
- 13018 1B **Research on terminal express delivery mode and outlet location under the background of county logistics** [13018-125]
- 13018 1C **Research on cost optimization of fresh cold chain logistics based on multimodal transport** [13018-132]
- 13018 1D **Design of intelligent traffic light system based on genetic algorithm to optimize Elman neural network** [13018-177]
- 13018 1E **Research on right-turn delay phase setting based on pedestrian and right-turn conflict** [13018-98]

- 13018 1F **Research on location selection of electric vehicle charging facilities based on hybrid algorithm** [13018-79]
- 13018 1G **Construction of MBSE-based smart beam yard system** [13018-62]
- 13018 1H **Improving graph convolutional networks with reinforcement learning for pure electric logistics vehicle routing** [13018-104]
- 13018 1I **Study on test and evaluation method of rear cross traffic alert system** [13018-119]
- 13018 1J **Research on driver machine interface recognition method of train control system based on YOLOv8** [13018-31]
- 13018 1K **Reinforcement learning-based genetic algorithm for solving low carbon multimodal transportation path planning problem** [13018-77]
- 13018 1L **A short term passenger flow prediction method for urban rail transit considering station classification** [13018-117]
- 13018 1M **Throughput maximization for UAV-assisted networks in emergency scenarios** [13018-93]
- 13018 1N **Research on ship route planning based on improved ant colony algorithm** [13018-248]
- 13018 1O **Research on customized bus route planning considering multiple path selection** [13018-40]
- 13018 1P **Research on an improved ship trajectory clustering method** [13018-232]
- 13018 1Q **Data analysis of overtaking test scene in blind spot detection system** [13018-197]
- 13018 1R **Research on the construction of urban wisdom logistics platform based on blockchain** [13018-114]
- 13018 1S **Research on optimization of delivery and pickup vehicle routing problems considering carbon emissions** [13018-190]
- 13018 1T **Joint distribution route optimization of vehicle and drone based on NSGA II** [13018-109]
- 13018 1U **Research on airport passenger flow forecast based on PSO-BP neural network** [13018-2]
- 13018 1V **Customized bus route planning based on taxi order data in a 'many-to-one' scenario** [13018-103]
- 13018 1W **Quantifying the relationships between air quality and transport before Covid-19** [13018-153]
- 13018 1X **Railroad freight volume prediction based on grey relation analysis and BP neural network** [13018-126]
- 13018 1Y **Evacuation time model of large passenger flow in rail transit** [13018-111]

- 13018 1Z **Optimization analysis of cold chain logistics network structure based on genetic algorithm** [13018-170]
- 13018 20 **Intelligent logistics and distribution decision making method research and system design** [13018-41]
- 13018 21 **Study on route optimization of truck-UAV joint distribution considering spatio-temporal clustering** [13018-94]
- 13018 22 **An optimization model for the regional freight structure** [13018-68]
- 13018 23 **Short term inbound passenger flow prediction of urban rail transit based on data denoising** [13018-193]
- 13018 24 **Optimization design based overall layout of cold chain logistics on Weihai City** [13018-85]
- 13018 25 **Study on the site selection of cold chain logistics base in Jinan** [13018-151]
- 13018 26 **Analysis model for emergency transportation and structural optimization in logistics** [13018-89]
- 13018 27 **Study on bifurcation and chaos of elastic collision in wheel-rail system of quarter vehicle** [13018-152]
- 13018 28 **Modeling and simulation of freight train braking system based on AMESIM** [13018-35]
- 13018 29 **Design of multi-UAV logistics distribution** [13018-146]
- 13018 2A **Research on overseas warehouse location based on bi-objective programming model** [13018-4]
- 13018 2B **Research on logistics supply chain optimization strategy based on machine learning** [13018-237]
- 13018 2C **Short-term traffic flow prediction based on CEEMDAN-CNN-LSTM** [13018-54]
- 13018 2D **Analysis of collaborative operation of port logistics system based on system dynamics** [13018-120]
- 13018 2E **Optimization study of bus route based on improved ant colony algorithm** [13018-51]
- 13018 2F **Study on location of end distribution network of SF Express company** [13018-92]

---

#### HIGHWAY DIGITAL MODELING AND ROAD MAINTENANCE

- 13018 2G **Advanced traffic conflict evaluation method with roadside LiDAR data** [13018-246]

- 13018 2H **Optimal deployment of dedicated autonomous vehicle lanes under mixed traffic flow conditions in a road network** [13018-101]
- 13018 2I **Analysis of driving behaviour in highway confluence areas** [13018-168]
- 13018 2J **Simulation analysis of multi angle collision of super high-speed car on bridge guardrail** [13018-169]
- 13018 2K **Dynamic response analysis of cable-stayed bridge structure under moving load based on finite element method** [13018-10]
- 13018 2L **Adhesion control of electric locomotives based on machine learning rail surface state recognition** [13018-247]
- 13018 2M **Research on the development path and construction effect evaluation index system of smart waterway** [13018-3]
- 13018 2N **Research on measurement and control method of swivel bridge across railway** [13018-212]
- 13018 2O **Analysis of highway maintenance decision-making based on complete information dynamic game theory** [13018-42]
- 13018 2P **Railway track alignment extraction method based on point cloud data** [13018-249]
- 13018 2Q **Interval design of expressway comprehensive energy system based on multi-objective optimization** [13018-221]
- 13018 2R **Pavement performance deterioration model based on deep neural networks** [13018-80]
- 13018 2S **Expressway traveler classification algorithm based on toll data** [13018-13]
- 13018 2T **Simulation analysis of highway autonomous driving dedicated lane setting** [13018-9]
- 13018 2U **Research on meteorological impact and monitoring application of highway** [13018-33]

## **Part Two**

- 13018 2V **Study on prediction of skid resistance of asphalt pavement based on genetic neural network** [13018-202]
- 13018 2W **Research on discrimination method of pavement disease causes based on machine learning** [13018-148]
- 13018 2X **A segmentation based prediction model for expressway toll in regional central cities** [13018-195]
- 13018 2Y **Research on the selection of key mechanical and electrical equipment of expressways based on environmental characteristics** [13018-188]



- 13018 2Z **Risk propagation mechanism and prediction model for highway diverging area** [13018-160]
- 13018 30 **A multilevel comprehensive fuzzy evaluation algorithm for highway route schemes considering operating speed and association rules** [13018-99]
- 13018 31 **Coding structure of digital highway model and implementation of automatic encoding based on rule engine** [13018-15]
- 13018 32 **Research on highway network layout optimization based on improved whale optimization algorithm** [13018-60]
- 13018 33 **Digital modelling and application of international freeway based on BIM technology** [13018-121]
- 13018 34 **Study on highway disaster risk classification of lean rainfall** [13018-38]
- 13018 35 **Risk assessment of immersed tube tunnel engineering based on Bayesian method** [13018-225]
- 13018 36 **Research on the drivers of carbon emissions from highway trucks based on pathway analysis** [13018-100]
- 13018 37 **Trajectory prediction and intent recognition in confluent waters based on RBF neural network** [13018-238]
- 13018 38 **SimlWay: an integrated simulation software platform for intelligent freeways based on SUMO and Unity3D** [13018-59]
- 13018 39 **Accident analysis of long and steep longitudinal highway slopes based on multi-source data under the background of Internet of Things** [13018-86]
- 13018 3A **Modeling analysis of flight support vehicle scheduling based on fuzzy colored petri nets** [13018-176]
- 13018 3B **Development of a suspended intelligent detection system for pipe culverts** [13018-144]
- 13018 3C **Structural modeling and lightweight design of orchard bridge track** [13018-50]
- 13018 3D **Spatial interpolation-based method for tunnel lighting quality assessment** [13018-228]
- 13018 3E **Research on the construction dynamic simulation and management using five-dimensional building information model** [13018-39]
- 13018 3F **Active integration algorithm of vehicle road cooperative signal based on deep reinforcement learning** [13018-211]
- 13018 3G **Roadside LiDAR background filtering method based on differences in the distance of points in the spherical coordinates** [13018-236]
- 13018 3H **Intelligent detection technology of over-under excavation in mining tunnel based on 3D laser scanning** [13018-11]

13018 3I **Autonomous driving road network generation and evaluation based on generative artificial intelligence** [13018-124]

---

**SMART CITY AND INTELLIGENT EMERGENCY MANAGEMENT**

---

13018 3J **Swing and shifting method of lane markings of divided lanes based on accurate identification method** [13018-105]

13018 3K **Model study of urban tourism itinerary chain based on the background of big data** [13018-250]

13018 3L **Demand for safe spaces: a study on pedestrians and e-bicyclist at urban crosswalks** [13018-17]

13018 3M **Investigating the elasticity of urban rail transit network after disturbance** [13018-76]

13018 3N **Risk assessment, prediction, and factor analysis for lanes at urban intersection** [13018-112]

13018 3O **Research and analysis of urban intelligent systems in the context of computer-based intelligent algorithms** [13018-251]

13018 3P **Used electric vehicle batteries recycling network based on multi-objective iterative local optimization algorithm** [13018-49]

13018 3Q **Heterogeneity analysis of driving effect of urban agglomeration transportation networks on passenger transport connections in different periods** [13018-155]

13018 3R **Cause analysis of marine accidents based on HFACS and Bayesian networks** [13018-95]

13018 3S **Comparative analysis of motor and non-motor vehicle accidents factors at day and night using association rules** [13018-63]

13018 3T **Optimization of multi-group and multi-routing train operation plan for urban rail transit** [13018-218]

13018 3U **Smart city multi-source data correlation methods** [13018-141]

13018 3V **Urban road network and function analysis based on space syntax in Xi 'an City** [13018-6]

13018 3W **Research and application of order carpooling method for improving the loading rate of cigarette industry enterprises** [13018-12]

13018 3X **On the safety influencing factors analysis of the urban road traffic based on the DEMATEL model** [13018-21]

13018 3Y **The modeling and analyzing for the acceleration of consensus in a grid/micro-grid organized community** [13018-30]

13018 3Z **Research on application of smart city construction based on BIM+GIS technology** [13018-57]

- 13018 40 **A thermal runaway risk warning scheme for power batteries** [13018-32]
- 13018 41 **Research on the suitability of urban cultural facilities supply and demand based on multi-source data** [13018-73]
- 13018 42 **Rule-based multi-vessel collision avoidance models** [13018-157]
- 13018 43 **Active safety testing method of longitudinal object based on dual-band device** [13018-178]
- 13018 44 **Development status of a smart lighting system in urban streets** [13018-210]
- 13018 45 **Analysis of urban population spatiotemporal distribution characteristics based on spatiotemporal data: a case study of Chongqing** [13018-7]
- 13018 46 **Anti-slip optimization control strategy for high-speed train** [13018-143]
- 13018 47 **Research on lane-level intelligent control strategies under multi-lane failure scenarios** [13018-61]
- 13018 48 **Research on intelligent receiving and control technology of domestic sewage from inland waterway vessels based on Beidou positioning** [13018-145]
- 13018 49 **Reverse logistics network design and optimization for battery recycling of waste electric vehicle based on circular economy** [13018-172]
- 13018 4A **Analysis of the destruction resistance of multi-mode freight network in Beijing-Tianjin-Hebei urban agglomeration** [13018-167]
- 13018 4B **Research on urban renewal based on semantic segmentation and spatial syntax: taking Wuyishan City as an example** [13018-203]
- 13018 4C **Optimization design of parking lot layout: taking Panzhuhua Wanda outdoor parking lot as an example** [13018-240]
- 13018 4D **Research on traveling salesman problem based on diffusion Monte Carlo method** [13018-162]
- 13018 4E **Regional land use correlation analysis for rail station impacts** [13018-22]
- 13018 4F **Analysis of the complex network characteristics of urban and rural slow moving traffic network in Chengyang, Qingdao** [13018-8]
- 13018 4G **Research on the influencing factors of urban on-street parking demand based on ensemble learning and SHAP** [13018-53]
- 13018 4H **Analysis of parking behavior in the context of urban renewal based on multi-day RP and SP data: a case study in Xi'an, China** [13018-43]
- 13018 4I **Unravel the spatio-temporal pattern of Chinese holiday intercity travel and mobility network characteristics: take the "May Day" holiday as an example** [13018-64]

- 13018 4J **Resilience assessment of container ports under storm disturbance based on fuzzy Bayesian network** [13018-55]
- 13018 4K **Model construction and optimization of drone pickup and delivery in remote rural areas** [13018-29]
- 13018 4L **The influence of horizontal projection angle of low-position road light on visibility under fog conditions** [13018-233]
- 13018 4M **Research on rapid warning model of expressway congestion abnormal events based on ETC gantry system** [13018-25]

---

**SPACE INFORMATION TECHNOLOGY AND SIGNAL PROCESSING**

---

- 13018 4N **Spatio-temporal characteristics and influencing factors of taxi average earnings** [13018-88]
- 13018 4O **Exploring the regional function in Shanghai and New York City** [13018-242]
- 13018 4P **Exploring the regional development trend in New York City** [13018-241]
- 13018 4Q **C-NCAP protocol research on door open warning (DOW) system** [13018-208]
- 13018 4R **Two step vehicle trajectory reconstruction strategy based on an improved outlier detection and data smoothing algorithm** [13018-44]
- 13018 4S **Improved particle swarm optimization least squares support vector machine method for train wireless time delay prediction** [13018-217]
- 13018 4T **Traffic signal control method based on traffic distribution prediction algorithm and delay characteristics in super spatiotemporal road network** [13018-194]
- 13018 4U **A novel computational approach to gas dynamic analogous exposure without observable collision angles** [13018-14]
- 13018 4V **Visual SLAM algorithm based on semantic information and IMU fusion in dynamic scenes** [13018-173]
- 13018 4W **Research on optimization of hub airline network based on simulated annealing algorithm** [13018-96]
- 13018 4X **Digital system of engineering building modeling based on intelligent optimization algorithm** [13018-140]
- 13018 4Y **Pedestrian trajectory prediction based on pedestrian velocity threshold constraints** [13018-87]
- 13018 4Z **Energy-saving optimization design of multi-story office buildings based on genetic algorithm** [13018-28]

- 13018 50 **Online parking space sharing system for residential areas based on intelligent algorithms** [13018-16]
- 13018 51 **The study on the safety domain of aids to navigation based on automatic identification system** [13018-206]
- 13018 52 **Conditional relay selection strategy based on V2X-NOMA cooperative network** [13018-71]
- 13018 53 **Autonomous vehicle scheduling at signal-free intersections based on deep reinforcement learning** [13018-207]
- 13018 54 **Research on flight trajectory prediction method based on transformer** [13018-235]
- 13018 55 **Regional water environment risk assessment and ecological health regulation based on genetic neural network** [13018-138]
- 13018 56 **Analysis of flight operation characteristics based on DBSCAN and K-Means** [13018-224]
- 13018 57 **Research on optimization of green route network** [13018-223]
- 13018 58 **Research on the collaborative optimization of outer container card booking and container turnover** [13018-135]
- 13018 59 **Structured scene generation for autonomous driving simulation and digital twin scheduling** [13018-209]
- 13018 5A **Research on risk map based on UAV safety operation indicators** [13018-110]
- 13018 5B **Multi-AGV integrated scheduling method for three-dimensional warehouse based on time window and Dijkstra algorithm** [13018-199]
- 13018 5C **Maximum adhesion point search method of high-speed train based on fuzzy logic** [13018-47]
- 13018 5D **Mapping to cells: a map-independent approach for traffic congestion detection** [13018-102]
- 13018 5E **Optimization of liner transportation network considering port congestion under public health emergencies** [13018-243]
- 13018 5F **Risk evaluation of navigation environment under composite navigation model** [13018-226]
- 13018 5G **An analysis of transfer decision-making behavior considering the influence of real-time bus information** [13018-213]
- 13018 5H **Research on the eco-driving strategy of coordination between signal intersection and dynamic mixed vehicle platoon** [13018-134]
- 13018 5I **Solving multi-depot electric vehicle scheduling problem by sparrow algorithm** [13018-156]
- 13018 5J **Ship scheduling optimization in restricted two-way channel ports** [13018-67]

- 13018 5K **Joint scheduling of trucks and RMGCs under synchronized loading and unloading mode in sea-rail intermodal container terminals [13018-69]**
- 13018 5L **Application of FLACS in solving the safety problem of densely populated areas near the propane wharf [13018-161]**
- 13018 5M **Multi-layer network mapping and management of project QHSE risk [13018-118]**
- 13018 5N **Calculation model for tunnel lighting based on DIALux [13018-150]**
- 13018 5O **Research on order picking strategy in manual picking operation [13018-116]**
- 13018 5P **Research on AEB car-to-car test scenario in intersection environment [13018-34]**
- 13018 5Q **Multi-scale object detection based on attention mechanism [13018-20]**