Vehicle Detection Using Fisheye Camera Ssrg Journals

As future generation information technology (FGIT) becomes specialized and fr- mented, it is easy to lose sight that many topics in FGIT have common threads and, because of this, advances in one discipline may be transmitted to others. Presentation of recent results obtained in different disciplines encourages this interchange for the advancement of FGIT as a whole. Of particular interest are hybrid solutions that c- bine ideas taken from multiple disciplines in order to achieve something more signi- cant than the sum of the individual parts. Through such hybrid philosophy, a new principle can be discovered, which has the propensity to propagate throughout mul- faceted disciplines. FGIT 2009 was the first mega-conference that attempted to follow the above idea of hybridization in FGIT in a form of multiple events related to particular disciplines of IT, conducted by separate scientific committees, but coordinated in order to expose the most important contributions. It included the following international conferences: Advanced Software Engineering and Its Applications (ASEA), Bio-Science and Bio-Technology (BSBT), Control and Automation (CA), Database Theory and Application (DTA), D- aster Recovery and Business Continuity (DRBC; published independently), Future G- eration Communication and Networking (FGCN) that was combined with Advanced Communication and Networking (ACN), Grid and Distributed Computing (GDC), M- timedia, Computer Graphics and Broadcasting (MulGraB), Security Technology (SecTech), Signal Processing, Image Processing and Pattern Recognition (SIP), and- and e-Service, Science and Technology (UNESST).

Over the last decade, the usage of unmanned systems such as Unmanned Aerial Vehicles (UAVs), Unmanned Surface Vessels (USVs) and Unmanned Ground Vehicles (UGVs) has increased drastically, and there is still a rapid growth. Today, unmanned systems are being deployed in many daily operations, e.g. for deliveries in remote areas, to increase efficiency of agriculture, and for environmental monitoring at sea. For safety reasons, unmanned systems are often the preferred choice for surveillance missions in hazardous environments, e.g. for detection of nuclear radiation, and in disaster areas after earthquakes, hurricanes, or during forest fires. For safe navigation of the unmanned systems during their missions, continuous and accurate global localization and attitude estimation is mandatory. Over the years, many vision-based methods for position estimation have been developed, primarily for urban areas. In contrast, this thesis is mainly focused on vision-based methods for accurate position and attitude estimates in natural environments, i.e. beyond the urban areas. Vision-based methods possess several characteristics that make them appealing as global position and attitude sensors. First, vision sensors can be realized and tailored for most unmanned vehicle applications. Second, geo-referenced terrain models can be generated worldwide from satellite imagery and can be stored onboard the vehicles. In natural environments, where the availability of geo-referenced images in general is low, registration of image information with terrain models is the natural choice for position and attitude estimation. This is the problem area that I addressed in the contributions of this thesis. The first contribution is a method for full 6DoF (degrees of freedom) pose estimation from aerial images. A dense local height map is computed using structure from motion. The global pose is inferred from the 3D similarity transform between the local height map and a digital elevation model. Aligning height information is assumed to be more robust to season variations than feature-based matching. The second contribution is a method for accurate attitude (pitch and roll angle) estimation via horizon detection. It is one of only a few methods that use an omnidirectional (fisheye) camera for horizon detection in aerial images. The method is based on edge detection and a probabilistic Hough voting scheme. The method allows prior knowledge of the attitude angles to be exploited to make the initial attitude estimates more robust. The estimates are then refined through registration with the geometrically expected horizon line from a digital elevation model. To the best of our knowledge, it is the first method where the ray refraction in the atmosphere is taken into account, which enables the highly accurate attitude estimates. The third contribution is a method for position estimation based on horizon detection in an omnidirectional panoramic image around a surface vessel. Two convolutional neural networks (CNNs) are designed and trained to estimate the camera orientation and to segment the horizon line in the image. The MOSSE correlation filter, normally used in visual object tracking, is adapted to horizon line registration with geometric data from a digital elevation model. Comprehensive field trials conducted in the archipelago demonstrate the GPS-level accuracy of the method, and that the method can be trained on images from one region and then applied to images from a previously unvisited test area. The CNNs in the third contribution apply the typical scheme of convolutions, activations, and pooling. The fourth contribution focuses on the activations and suggests a new formulation to tune and optimize a piecewise linear activation function during training of CNNs. Improved classification results from experiments when tuning the activation function led to the introduction of a new activation function, the Shifted Exponential Linear Unit (ShELU).

Autonomous Driving and Advanced Driver-Assistance Systems (ADAS): Applications, Development, Legal Issues, and Testing outlines the latest research related to autonomous cars and advanced driver-assistance systems, including the development, testing, and verification for real-time situations of sensor fusion, sensor placement, control algorithms, and computer vision. Features: Co-edited by an experienced roboticist and author and an experienced academic Addresses the legal aspect of autonomous driving and ADAS Presents the application of ADAS in autonomous vehicle parking systems With an infinite number of real-time possibilities that need to be addressed, the methods and the examples included in this book are a valuable source of information for academic and industrial researchers, automotive companies, and suppliers.

Safety has become one of the most important fields to develop for the vehicle industry. Both in the automotive industry and others, new features for traditional vehicles are being developed to increase the safety and comfort of passengers, such as autonomous driving. In the case of the motorcycle industry, autonomous driving is further away from implementation, so this sector is developing other ways to increase the safety of its vehicles. At the Technische Universität Darmstadt, a test motorcycle is setup to better understand how motorcycle riders behave in different situations. The system is based on different sensors and cameras to capture the status of both the motorcycle and the rider in each of these situations. One of the objectives of this project is to develop a tool that fits the TU Darmstadt project to estimate the position of the rider through fisheye cameras located on the back and front of the motorcycle. For this purpose, different methods of object detection through image processing have been evaluated, taking into account the potential of each and the final objective of this tool. The results of these different tests have resulted in a system composed of small markers that, incorporated on the jacket of the rider, allow to extract the position of each one of the locations. For this, a tool based on three stages has been developed. The first is to extract the parameters of the camera to be able to analyse the images afterwards. The second consists of compensating the distortion caused by the fisheye cameras, using the parameters extracted in the first stage. In the last stage, the tool allows to analyse the position and orientation of the markers in the image and converting it into the position it occupies in the motorcycle coordinates. This tool has been tested with different tests to analyse its accuracy. Analysing the results, it is determined that this tool is a valid approach to satisfy the purposes of the project of the Technische Univertität Darmstadt. The precision, although variant in each of the tests, is sufficiently high to satisfy its objective in the ranges in which the tool has been configured. Finally the tool is tested under the conditions for which it was designed, and the possible aspects to be improved are detailed for its subsequent implementation.

This book presents the results of the successful Sensors Special Issue on Intelligent Vehicles that received submissions between March 2019 and May 2020. The Guest Editors of this Special Issue are Dr. David Fernández-Llorca, Dr. Ignacio Parra-Alonso, Dr. Iván García-Daza and Dr. Noelia Parra-Alonso, all from the Computer Engineering Department at the University of Alcalá (Madrid, Spain). A total of 32

manuscripts were finally accepted between 2019 and 2020, presented by top researchers from all over the world. The reader will find a well-representative set of current research and developments related to sensors and sensing for intelligent vehicles. The topics of the published manuscripts can be grouped into seven main categories: (1) assistance systems and automatic vehicle operation, (2) vehicle positioning and localization, (3) fault diagnosis and fail-x systems, (4) perception and scene understanding, (5) smart regenerative braking systems for electric vehicles, (6) driver behavior modeling and (7) intelligent sensing. We, the Guest Editors, hope that the readers will find this book to contain interesting papers for their research, papers that they will enjoy reading as much as we have enjoyed organizing this Special Issue

This book constitutes the refereed post-conference proceedings of the Fifth International Conference on IoT as a Service, IoTaaS 2019, which took place in Xi'an, China, in November 2019. The 54 revised full papers were carefully reviewed and selected from 106 submissions. The papers contribute to the discussion on the challenges posed by Internet of Things (Io). The two technical tracks and three workshops deal in detail: Networking and Communications Technologies for IoT, IoT as a service, International Workshop on Edge Intelligence and Computing for IoT Communications and Applications, International Workshop on Wireless Automated Networking for Internet of Things, and International Workshop on Ubiquitous Services Transmission for Internet of Things.

This book constitutes the refereed proceedings of the 12th International Conference on Advanced Concepts for Intelligent Vision Systems, ACIVS 2010, held in Changchun, China, in August 2010. The 78 revised full papers presented were carefully reviewed and selected from 144 submissions. The papers are organized in topical sections on image processing and analysis; segmentation and edge detection; 3D and depth; algorithms and optimizations; video processing; surveillance and camera networks; machine vision; remote sensing; and recognition, classification and tracking.

This book constitutes the thoroughly refereed post-conference proceedings of the 7th International Conference on Smart Cities and Green ICT Systems, SMARTGREENS 2018, and the 4th International Conference on Vehicle Technology and Intelligent Transport Systems, VEHITS 2018, held in Funchal-Madeira, Portugal in March 2018. The 18 full papers presented during SMARTGREENS 2018 and VEHITS 2018 were carefully reviewed and selected from numerous submissions. The papers reflect topics such as smart cities and green ICT systems; vehicle technology and intelligent transport systems.

To tackle the challenges of the road estimation task, many works employ a fusion of multiple sources. By that, a commonly made assumption is that the sources always are equally reliable. However, this assumption is inappropriate since each source has certain advantages and drawbacks depending on the operational scenarios. Therefore, Tuan Tran Nguyen proposes a novel concept by incorporating reliabilities into the multi-source fusion so that the road estimation task can alternately select only the most reliable sources. Thereby, the author estimates the reliability for each source online using classifiers trained with the sensor measurements, the past performance and the context. Using real data recordings, he shows via experimental results that the presented reliability-aware fusion increases the availability of automated driving up to 7 percentage points compared to the average fusion. About the Author: Tuan Tran Nguyen received the Master's degree in computer science and the Ph.D. degree from Otto-von-Guericke University Magdeburg, Germany, in 2013 and 2019, respectively. His research focuses on methods and architectures for reliability-based sensor fusion in intelligent vehicles.

This book gathers selected papers presented at the conference "Advances in 3D Image and Graphics Representation, Analysis, Computing and Information Technology," one of the first initiatives devoted to the problems of 3D imaging in all contemporary scientific and application areas. The aim of the conference was to establish a platform for experts to combine their efforts and share their ideas in the related areas in order to promote and accelerate future development. This second volume discusses algorithms and applications, focusing mainly on the following topics: 3D printing technologies; naked, dynamic and auxiliary 3D displays; VR/AR/MR devices; VR camera technologies; microprocessors for 3D data processing; advanced 3D computing systems; 3D data-storage technologies; 3D data networks and technologies; 3D data intelligent processing; 3D data cryptography and security; 3D visual quality estimation and measurement; and 3D decision support and information systems.

This book constitutes the refereed proceedings of the 36th German Conference on Pattern Recognition, GCPR 2014, held in Münster, Germany, in September 2014. The 58 revised full papers and 8 short papers were carefully reviewed and selected from 153 submissions. The papers are organized in topical sections on variational models for depth and flow, reconstruction, bio-informatics, deep learning and segmentation, feature computation, video interpretation, segmentation and labeling, image processing and analysis, human pose and people tracking, interpolation and inpainting.

The two-volume set LNCS 11751 and 11752 constitutes the refereed proceedings of the 20th International Conference on Image Analysis and Processing, ICIAP 2019, held in Trento, Italy, in September 2019. The 117 papers presented were carefully reviewed and selected from 207 submissions. The papers cover both classic and the most recent trends in image processing, computer vision, and pattern recognition, addressing both theoretical and applicative aspects. They are organized in the following topical sections: Video Analysis and Understanding; Pattern Recognition and Machine Learning; Deep Learning; Multiview Geometry and 3D Computer Vision; Image Analysis, Detection and Recognition; Multimedia; Biomedical and Assistive Technology; Digital Forensics; Image processing for Cultural Heritage.

The sixteen-volume set comprising the LNCS volumes 11205-11220 constitutes the refereed proceedings of the 15th European Conference on Computer Vision, ECCV 2018, held in Munich, Germany, in September 2018.The 776 revised papers presented were carefully reviewed and selected from 2439 submissions. The papers are organized in topical sections on learning for vision; computational photography; human analysis; human sensing; stereo and reconstruction; optimization; matching and recognition; video attention; and poster sessions.

This book constitutes the refereed proceedings of the International Conference on Computer Vision and Graphics, ICCVG 2014, held in Warsaw, Poland, in September 2014. The 81 full papers presented were carefully reviewed and selected from various submissions. They cover various important aspects of computer vision and graphics.

The two-volume set LNAI 8856 and LNAI 8857 constitutes the proceedings of the 13th Mexican International Conference on Artificial Intelligence, MICAI 2014, held in Tuxtla, Mexico, in November 2014. The total of 87 papers plus 1 invited talk presented in these proceedings were carefully reviewed and selected from 348 submissions. The first volume deals with advances in human-inspired computing and its applications. It contains 44 papers structured into seven sections: natural language processing, natural language processing applications, opinion mining, sentiment analysis, and social network applications, computer vision, image processing, logic, reasoning, and multi-agent systems, and intelligent tutoring systems. The second volume deals with advances in nature-inspired computation and machine learning and contains also 44 papers structured into eight sections: genetic and evolutionary algorithms, neural networks, machine

learning, machine learning applications to audio and text, data mining, fuzzy logic, robotics, planning, and scheduling, and biomedical applications.

The three-volume set, consisting of LNCS 10116, 10117, and 10118, contains carefully reviewed and selected papers presented at 17 workshops held in conjunction with the 13th Asian Conference on Computer Vision, ACCV 2016, in Taipei, Taiwan in November 2016. The 134 full papers presented were selected from 223 submissions. LNCS 10116 contains the papers selected

This proceedings book presents the latest research findings, and theoretical and practical perspectives on innovative methods and development techniques related to the emerging areas of Web computing, intelligent systems and Internet computing. The Web has become an important source of information, and techniques and methodologies that extract quality information are of paramount importance for many Web and Internet applications. Data mining and knowledge discovery play a key role in many of today's major Web applications, such as e-commerce and computer security. Moreover, Web services provide a new platform for enabling service-oriented systems. The emergence of large-scale distributed computing paradigms, such as cloud computing and mobile computing systems, has opened many opportunities for collaboration services, which are at the core of any information system. Artificial intelligence (AI) is an area of computer science that builds intelligent systems and algorithms that work and react like humans. AI techniques and computational intelligence are powerful tools for learning, adaptation, reasoning and planning, and they have the potential to become enabling technologies for future intelligent networks. Research in the field of intelligent systems, robotics, neuroscience, artificial intelligence and cognitive sciences is vital for the future development and innovation of Web and Internet applications.

The 6-volume set, comprising the LNCS books 12535 until 12540, constitutes the refereed proceedings of 28 out of the 45 workshops held at the 16th European Conference on Computer Vision, ECCV 2020. The conference was planned to take place in Glasgow, UK, during August 23-28, 2020, but changed to a virtual format due to the COVID-19 pandemic. The 249 full papers, 18 short papers, and 21 further contributions included in the workshop proceedings were carefully reviewed and selected from a total of 467 submissions. The papers deal with diverse computer vision topics. Part V includes: The 16th Embedded Vision Workshop; Real-World Computer Vision from Inputs with Limited Quality (RLQ); The Bright and Dark Sides of Computer Vision: Challenges and Opportunities for Privacy and Security (CV-COPS 2020); The Visual Object Tracking Challenge Workshop (VOT 2020); and Video Turing Test: Toward Human-Level Video Story Understanding.

Robot Systems for Rail Transit Applications presents the latest advances in robotics and artificial intelligence for railway systems, giving foundational principles and running through special problems in robot systems for rail transit. State-of-the art research in robotics and railway systems is presented alongside a series of real-world examples. Eight chapters give definitions and characteristics of rail transit robot systems, describe assembly and collaborative robots in manufacturing, introduce automated guided vehicles and autonomous rail rapid transit, demonstrate inspection robots, cover trench robots, and explain unmanned aerial vehicles. This book offers an integrated and highly-practical way to approach robotics and artificial intelligence in rail-transit. Introduces robot and artificial intelligence (AI) systems for rail transit applications Presents research alongside step-by-step coverage of real-world cases Gives the theoretical foundations underlying practical application Offers solutions for high-speed railways from the latest work in robotics Shows how robotics and AI systems afford new and efficient methods in rail transit

This monograph provides comprehensive guidelines on the current and future trends of innovative simulation systems. In particular, their important components, such as augmented reality and unmanned vehicles are presented. The book consists of three parts. Each part presents good practices, new methods, concepts of systems and new algorithms. Presented challenges and solutions are the results of research and conducted by the contributing authors. The book describes and evaluates the current state of knowledge in the field of innovative simulation systems. Throughout the chapters there are presented current issues and concepts of systems, technology, equipment, tools, research challenges and current, past and future applications of simulation systems. The book is addressed to a wide audience: academic staff, representatives of research institutions, employees of companies and government agencies as well as students and graduates of technical universities in the country and abroad. The book can be a valuable source of information for constructors and developers of innovative simulation systems and their components. Scientists and researchers involved in mechanics, control algorithms, image processing, computer vision or data fusion can find many valuable suggestions and solutions.

This book aims to teach the core concepts that make Self-driving vehicles (SDVs) possible. It is aimed at people who want to get their teeth into self-driving vehicle technology, by providing genuine technical insights where other books just skim the surface. The book tackles everything from sensors and perception to functional safety and cybersecurity. It also passes on some practical know-how and discusses concrete SDV applications, along with a discussion of where this technology is heading. It will serve as a good starting point for software developers or professional engineers who are eager to pursue a career in this exciting field and want to learn more about the basics of SDV algorithms. Likewise, academic researchers, technology enthusiasts, and journalists will also find the book useful. Key Features: Offers a comprehensive technological walk-through of what really matters in SDV development: from hardware, software, to functional safety and cybersecurity Written by an active practitioner with extensive experience in series development and research in the fields of Advanced Driver Assistance Systems (ADAS) and Autonomous Driving Covers theoretical fundamentals of state-of-the-art SLAM, multi-sensor data fusion, and other SDV algorithms. Includes practical information and hands-on material with Robot Operating System (ROS) and Open Source Car Control (OSCC). Provides an overview of the strategies, trends, and applications which companies are pursuing in this field at present as well as other technical insights from the industry.

This book provides an overview of positioning technologies, applications and services in a format accessible to a wide variety of readers. Readers who have always wanted to understand how satellite-based positioning, wireless network positioning, inertial navigation, and their combinations work will find great value in this book. Readers will also learn about the advantages and disadvantages of different positioning methods, their limitations and challenges. Cognitive positioning, adding the brain to determine which technologies to use at device runtime, is introduced as well. Coverage also includes the use of position information for Location Based Services (LBS), as well as context-aware positioning services, designed for better user experience.

This book constitutes the refereed proceedings of the 11th International Conference on Computer Vision Systems, ICVS 2017, held in Shenzhen, China, in July 2017. The 61 papers presented were carefully reviewed and selected from 92 submissions. The papers are organized in topical sections on visual control, visual navigation, visual inspection, image processing, human robot interaction, stereo system, image retrieval, visual detection, visual recognition, system design, and 3D vision / fusion.

This publication addresses distributed embedded smart cameras –cameras that perform on board analysis and collaborate with other cameras. This book provides the material required to better understand the architectural design challenges of embedded smart camera systems, the hardware/software ecosystem, the design approach for and applications of distributed smart cameras together with the state-of-the-art algorithms. The authors concentrate on the architecture, hardware/software design, realization of smart camera networks from applications to architectures, in particular in the embedded and mobile domains.

By the dawn of the new millennium, robotics has undergone a major transformation in scope and dimensions. This expansion has been brought about by the maturity of the field and the

advances in its related technologies. From a largely dominant industrial focus, robotics has been rapidly expanding into the challenges of the human world. The new generation of robots is expected to safely and dependably co-habitat with humans in homes, workplaces, and communities, providing support in services, entertainment, education, healthcare, manufacturing, and assistance. Beyond its impact on physical robots, the body of knowledge robotics has produced is revealing a much wider range of applications reaching across diverse research areas and scientific disciplines, such as: biomechanics, haptics, neurosciences, virtual simulation, animation, surgery, and sensor networks among others. In return, the challenges of the new emerging areas are proving an abundant source of stimulation and insights for the field of robotics. It is indeed at the intersection of disciplines that the most striking advances happen. The goal of the series of Springer Tracts in Advanced Robotics (STAR) is to bring, in a timely fashion, the latest advances and developments in robotics on the basis of their significance and quality. It is our hope that the wider dissemination of research developments will stimulate more exchanges and collaborations among the research community and contribute to further advancement of this rapidly growing field.

Road Traffic Modeling and Management: Using Statistical Monitoring and Deep Learning provides a framework for understanding and enhancing road traffic monitoring and management. The book examines commonly used traffic analysis methodologies as well the emerging methods that use deep learning methods. Other sections discuss how to understand statistical models and machine learning algorithms and how to apply them to traffic modeling, estimation, forecasting and traffic congestion monitoring. Providing both a theoretical framework along with practical technical solutions, this book is ideal for researchers and practitioners who want to improve the performance of intelligent transportation systems. Provides integrated, up-to-date and complete coverage of the key components for intelligent transportation systems: traffic modeling, forecasting, estimation and monitoring Uses methods based on video and time series data for traffic modeling and forecasting Includes case studies, key processes guidance and comparisons of different methodologies

The two volume set LNCS 8887 and 8888 constitutes the refereed proceedings of the 10th International Symposium on Visual Computing, ISVC 2014, held in Las Vegas, NV, USA. The 74 revised full papers and 55 poster papers presented together with 39 special track papers were carefully reviewed and selected from more than 280 submissions. The papers are organized in topical sections: Part I (LNCS 8887) comprises computational bioimaging, computer graphics; motion, tracking, feature extraction and matching, segmentation, visualization, mapping, modeling and surface reconstruction, unmanned autonomous systems, medical imaging, tracking for human activity monitoring, intelligent transportation systems, visual perception and robotic systems. Part II (LNCS 8888) comprises topics such as computational bioimaging , recognition, computer vision, applications, face processing and recognition, virtual reality, and the poster sessions.

This book constitutes the thoroughly refereed proceedings of the 10th International Conference on Image Analysis and Recognition, ICIAR 2013, held in Póvoa do Varzim, Portugal, in June 2013, The 92 revised full papers presented were carefully reviewed and selected from 177 submissions. The papers are organized in topical sections on biometrics: behavioral; biometrics: physiological; classification and regression; object recognition; image processing and analysis: representations and models, compression, enhancement , feature detection and segmentation; 3D image analysis; tracking; medical imaging: image segmentation, image registration, image analysis, coronary image analysis, retinal image analysis, computer aided diagnosis, brain image analysis; cell image analysis; RGB-D camera applications; methods of moments; applications.

The three volume set LNCS 7583, 7584 and 7585 comprises the Workshops and Demonstrations which took place in connection with the European Conference on Computer Vision, ECCV 2012, held in Firenze, Italy, in October 2012. The total of 179 workshop papers and 23 demonstration papers was carefully reviewed and selected for inclusion in the proceedings. They where held at workshops with the following themes: non-rigid shape analysis and deformable image alignment; visual analysis and geo-localization of large-scale imagery; Web-scale vision and social media; video event categorization, tagging and retrieval; re-identification; biological and computer vision interfaces; where computer vision meets art; consumer depth cameras for computer vision; unsolved problems in optical flow and stereo estimation; what's in a face?; color and photometry in computer vision; computer vision in vehicle technology: from earth to mars; parts and attributes; analysis and retrieval of tracked events and motion in imagery streams; action recognition and pose estimation in still images; higher-order models and global constraints in computer vision; information fusion in computer vision for concept recognition; 2.5D sensing technologies in motion: the quest for 3D; benchmarking facial image analysis technologies.

This book constitutes the refereed proceedings of the 6th International Conference, ICISP 2014, held in June/July 2014 in Cherbourg, France. The 76 revised full papers were carefully reviewed and selected from 164 submissions. The contributions are organized in topical sections on multispectral colour science, color imaging and applications, digital cultural heritage, document image analysis, graph-based representations, image filtering and representation, computer vision and pattern recognition, computer graphics, biomedical, and signal processing.

This book presents research trends on computer vision, especially on application of robotics, and on advanced approachs for computer vision (such as omnidirectional vision). Among them, research on RFID technology integrating stereo vision to localize an indoor mobile robot is included in this book. Besides, this book includes many research on omnidirectional vision, and the combination of omnidirectional vision with robotics. This book features representative work on the computer vision, and it puts more focus on robotics vision and omnidirectioal vision. The intended audience is anyone who wishes to become familiar with the latest research work on computer vision, especially its applications on robots. The contents of this book allow the reader to know more technical aspects and applications of computer vision. Researchers and instructors will benefit from this book.

Proceedings of the FISITA 2012 World Automotive Congress are selected from nearly 2,000 papers submitted to the 34th FISITA World Automotive Congress, which is held by Society of Automotive Engineers of China (SAE-China) and the International Federation of Automotive Engineering Societies (FISITA). This proceedings focus on solutions for sustainable mobility in all areas of passenger car, truck and bus transportation. Volume 9: Automotive Safety Technology focuses on: •Automotive Structure Crashworthiness •Occupant and Child Safety Protection •Pedestrian Protection •Crash Biomechanics •Crash Pre-Judge Technology /Traffic Accident Analysis and reconstruction •Crash Compatibilty •Driving Action Perception and Safety Assistance System •Vehicle Controls on Handing and Stability •Safety Standards and International Regulations Above all researchers, professional engineers and graduates in fields of automotive engineering, mechanical engineering and electronic engineering will benefit from this book. SAE-China is a national academic organization composed of enterprises and

professionals who focus on research, design and education in the fields of automotive and related industries. FISITA is the umbrella organization for the national automotive societies in 37 countries around the world. It was founded in Paris in 1948 with the purpose of bringing engineers from around the world together in a spirit of cooperation to share ideas and advance the technological development of the automobile.

This book constitutes the proceedings of the Second International Conference on Smart Multimedia, ICSM 2019, which was held in San Diego, CA, USA, in December 2019. The 45 papers presented were selected from about 100 submissions and are grouped in sections on 3D mesh and depth image processing; image understanding; miscellaneous; smart multimedia for citizen-centered smart living; 3D perception and applications; video applications; multimedia in medicine; haptics and applications; smart multimedia beyond the visible spectrum; machine learning for multimedia; image segmentation and processing; biometrics; 3D and image processing; and smart social and connected household products.

The main topic of this book is the recent development of on-board advanced driver-assistance systems (ADAS), which we can already tell will eventually contribute to the autonomous and connected vehicles of tomorrow. With the development of automated mobility, it becomes necessary to design a series of modules which, from the data produced by on-board or remote information sources, will enable the construction of a completely automated driving system. These modules are perception, decision and action. State-of-the-art AI techniques and their potential applications in the field of autonomous vehicles are described. Perception systems, focusing on visual sensors, the decision module and the prototyping, testing and evaluation of ADAS systems are all presented for effective implementation on autonomous and connected vehicles. This book also addresses cooperative systems, such as pedestrian detection, as well as the legal issues in the use of autonomous vehicles in open environments.

Smartphones from an Applied Research Perspective highlights latest advancements of research undertaken in multidisciplinary fields where the smartphone plays a central role. Smartphone is synonymous to innovation in today's society. Very few visionaries predicted its social, cultural, technological and economic impacts, although the usage of smartphone is almost pervasive and transcendental. This book is meant for researchers and postgraduate students looking forward for hot topics for their final year projects, doctoral or even postdoctoral studies. Practitioners too will find food for thought and will surely be amazed by the broadness of the topics presented.

This book provides a concise and comprehensive overview of vehicular communication technologies. It classifies all relevant standards, protocols and applications, so as to enable the reader to gain a holistic approach towards the subject of vehicular communications. The primary methods are algorithmic processes and simulation results.First, an overview and classification of vehicular technologies is presented. Then, the book focuses on specific applications of V2V and V2I communications. Special attention is given to recent research and development results regarding R&D projects in the field, in cooperation with car manufacturing companies and universities at a global level.Designed to facilitate understanding of vehicle to vehicle and vehicle to infrastructure technologies, this textbook is appropriate for undergraduate and graduate students of vehicular communications or mobile networks.