

# Read Free Akai Cs M3 Cs M4 Stereo Cassette Deck Repair Manual Read Pdf Free

2021 International Conference on Security and Information Technologies with AI, Internet Computing and Big-data Applications **BMW M3 49 Success Secrets - 49 Most Asked Questions on BMW M3 - What You Need to Know** Electrical Condensers Department of Veterans Affairs Publications Index Knowledge Graphs and Semantic Web Procedural Semantics for Hyperintensional Logic **Essential Principles of Image Sensors Advances in Mechanical Design Challenges in Computational Statistics and Data Mining** Discrete and Computational Geometry Nature **Flexible Query Answering Systems** The Complete Works of Oscar Wilde: Poems and poems in prose Printed Organic and Molecular Electronics **Applications of Computational Intelligence in Concrete Technology Facing the Other: Novel Theories and Methods in Face Perception Research Millimeter-Wave Circuits for 5G and Radar Atomic Energy Levels Flexible Regression and Smoothing Sustainability, Eco-efficiency, and Conservation in Transportation Infrastructure Asset Management** Reliability of Computer Systems and Networks Kommunikation in Verteilten Systemen (KiVS) **Department of Defense Appropriations for Fiscal Year 1971: Secretary of Defense, Chairman, Joint Chiefs of Staff Department of Defense Appropriations for Fiscal Year 1971** Rotifer Symposium IV **Journal of Research of the National Bureau of Standards Modeling and Transformation of Workflows with Temporal Constraints** Atmospheric Propagation and Remote Sensing III Dept. of Defense, defense agencies, public witnesses **Quantum Signatures of Chaos Statistical Modeling for Computer-Aided Design of MOS VLSI Circuits Atmospheric Propagation and Remote Sensing Principles of Knowledge Representation and Reasoning** High Performance Silicon Imaging Security and Privacy in the Age of Ubiquitous Computing CARNEWS 2022/1 (NO.373) **Biosurfactants for the Biobased Economy Color Imaging ... Integrated and Collaborative Product Development Environment**

This book constitutes the thoroughly refereed post-proceedings of the Japanese Conference on Discrete Computational Geometry, JCDCG 2001, held in Tokyo, Japan in November 2001. The 35 revised papers presented were carefully reviewed and selected. Among the topics covered are polygons and polyhedrons, divisible dissections, convex polygon packings, symmetric subsets, convex decompositions, graph drawing, graph computations, point sets, approximation, Delaunay diagrams, triangulations, chromatic numbers, complexity, layer routing, efficient algorithms, and illumination problems. With the rapid advances in computing and Internet technologies, an integrated and collaborative environment, which is based on the complementary functions of concurrent engineering and Internet-based collaborative engineering, is imperative for companies to facilitate and expedite the product realization processes. Topics such as concurrent and collaborative engineering, feature-based design and manufacturing, evolutionary computational techniques such as Tabu Search, Simulated Annealing, Genetic Algorithms features, intelligent and computer-aided process planning are important strategies and enabling technologies for developing an integrative environment, facilitating modern product design and development. This book covers the state-of-the-art research and development status of these strategies and technologies. Implementation strategies and case studies are provided with an emphasis on technical details to help readers understand the underlying algorithms and infrastructures. Contents: Manufacturing Feature Recognition Technology - State-of-the-Art; A Hybrid Method for Interacting Manufacturing Feature Recognition; Integration of Design-by-Feature and Manufacturing Feature Recognition; Intelligent Optimization of Process Planning; Collaborative Computer-Aided Design - State-of-the-Art; Development of Web-Based Process Planning Optimization System; Distributed and Collaborative Design-by-Feature System. Key Features Provides comprehensive surveys in the integrative and collaborative product development Updates the most recent R & D work of the last decade in the relevant areas Contains highly analytical approaches and methodologies Comprehensively covers implementation strategies and case studies Detailed discussions and comparisons of various approaches, algorithms and techniques

Readership: Mechanical and manufacturing engineering graduate students, researchers in the field of concurrent engineering, collaborative engineering and intelligent engineering. Engineers in charge of utilization, development of concurrent and collaborative software tools. High Performance Silicon Imaging: Fundamentals and Applications of CMOS and CCD Sensors, Second Edition, covers the fundamentals of silicon image sensors, addressing existing performance issues and current and emerging solutions. Silicon imaging is a fast growing area of the semiconductor industry. Its use in cell phone cameras is already well established, with emerging applications including web, security, automotive and digital cinema cameras. The book has been revised to reflect the latest state-of-the art developments in the field, including 3D imaging, advances in achieving lower signal noise, and new applications for consumer markets. The fundamentals section has also been expanded to include a chapter on the characterization and testing of CMOS and CCD sensors that is crucial to the success of new applications. This book is an excellent resource for both academics and engineers working in the optics, photonics, semiconductor and electronics industries. Covers the fundamentals of silicon-based image sensors and technical advances, focusing on performance issues Looks at image sensors in applications, such as mobile phones, scientific imaging, and TV broadcasting, and in automotive, consumer and biomedical applications Addresses the theory behind 3D imaging and 3D sensor development, including challenges and opportunities This book provides a comprehensive overview of current biosurfactant research and applications. Public awareness of environmental issues has increased significantly over the last decade, a trend that has been accompanied by industry demands for climate-friendly and environmentally friendly renewable raw materials. In the context of household products, biosurfactants could potentially meet this demand in the future due to their low ecotoxicity, excellent biodegradability, and use of renewable raw materials. The diversity of this class of molecules, which has only been marginally tapped to date, offers only an inkling of their future application potential. However, there are two main obstacles to their widespread commercial use on the growing surfactant market: the lack of attractive and competitive production technologies, and the limited structural diversity of commercially available biosurfactants. Addressing both of these core issues, this book will provide readers with a deeper understanding of the role of biosurfactants, including future opportunities and challenges. Chapter "Environmental Impacts of Biosurfactants from a Life Cycle Perspective: A Systematic Literature Review" is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com. This book constitutes the refereed proceedings of the 13th International Conference on Flexible Query Answering Systems, FQAS 2019, held in Amantea, Italy, in July 2019. The 27 full papers and 10 short papers presented were carefully reviewed and selected from 43 submissions. The papers present emerging research trends with a special focus on flexible querying and analytics for smart cities and smart societies in the age of big data. They are organized in the following topical sections: flexible database management and querying; ontologies and knowledge bases; social networks and social media; argumentation-based query answering; data mining and knowledge discovery; advanced flexible query answering methodologies and techniques; flexible query answering methods and techniques; flexible intelligent information-oriented and network-oriented approaches; big data veracity and soft computing; flexibility in tools; and systems and miscellanea. The fourth international rotifer symposium was Wednesday afternoon a tour of Edinburgh, included held in Edinburgh, Scotland, August 18 - 25, 1985, including a visit to the Palace of Holyrood, was arranged. hosted by the Institute of Terrestrial Ecology. This This was followed by an evening banquet with meeting continued the tradition of holding rotifer traditional Scottish entertainment. On Thursday symposia at three-year intervals. The first an evening most participants attended a fireworks display announcement of the fourth meeting was circulated at play which was part of the Edinburgh Festival. From the end of 1983 to almost 300 people whose names naturally, an excursion to Loch Lomond and the Trossachs appeared on the mailing list of the international society hills was arranged for the Saturday after the newsletter, Rotifer News. In total, 68 people from meeting. 23 countries attended the

meeting. It is interesting The organisers would like to thank Mr. C. J. to note that, of these 68 participants, 21 had at Place and colleagues at the Institute of Terrestrial tended the first meeting, held in Linz, Austria, Ecology for their invaluable help in organising the 1976, and 13 had attended all three previous meet meeting and preparing the symposium volume for ings. publication. We are also grateful for financial sup As in previous symposia, some research topics port from the Royal Society, the British Council were identified in advance of the meeting as being and British Petroleum (Scotland). This volume of Poems and Poems in Prose inaugurates the Oxford English Texts Complete Works of Oscar Wilde. It provides texts of Wilde's one-hundred and nineteen poems and poems in prose, including twenty-one never published in his lifetime, together with the publishing history of each poem, and a detailed commentary on allusions and echoes, imagery, and points of biographical interest. This classic text provides an excellent introduction to a new and rapidly developing field of research. Now well established as a textbook in this rapidly developing field of research, the new edition is much enlarged and covers a host of new results. Stringently reviewed papers presented at the October 1992 meeting held in Cambridge, Mass., address such topics as nonmonotonic logic; taxonomic logic; specialized algorithms for temporal, spatial, and numerical reasoning; and knowledge representation issues in planning, diagnosis, and natural langu We rely heavily on faces during social interactions. Humans possess the ability to recognise thousands of people very quickly and accurately without effort. The serious social difficulties that follow abnormalities of the face recognition system (i.e., prosopagnosia) strongly underline the importance of typical face skills in our everyday life. Over the last fifty years, research on prosopagnosia, along with research in the healthy population, has provided insights into the cognitive and neural features behind typical face recognition. This has also been achieved thanks to non-invasive neuroimaging techniques such as functional Magnetic Resonance Imaging (fMRI), Electroencephalography (EEG), Magnetoencephalography (MEG), Diffusion Tensor Imaging (DTI) and Transcranial Magnetic Stimulation (TMS). However, there is still much debate about the cognitive and neural mechanisms of face perception. In the current "Research Topic" we plan to gather experimental works, opinions, commentaries, mini-reviews and reviews that focus on new or novel theories and methods in face perception research. Where is the field at the moment? Do we need to re-think the experimental procedures we have adopted so far? Again, what kind of techniques (or combination of them) and analysis methods will be important in the future? From the experimental point of view we encourage both behavioural and neuroimaging contributions (e.g., fMRI, EEG, MEG, DTI and TMS). Despite the main emphasis on face perception, memory and identification, we will also consider original works that focus on other aspects of face processing, such as expression recognition, attractiveness judgments and face imagery. In addition, animal investigations and experimental manipulations that alter face recognition abilities in typical human subjects (e.g., hypnosis) are also welcome. Overall, we are proposing a Research Topic that looks at face processing using different perspectives and welcome contributions from different domains such as psychology, neurology, neuroscience, cognitive science and philosophy. The current "Research Topic" evolved over the desire to acknowledge the relatively recent loss of three giants in the field: Drs. Shlomo Bentin, Truett Allison and Andy Calder. We dedicate this "Research Topic" to them and their pioneering studies. Computational intelligence (CI) in concrete technology has not yet been fully explored worldwide because of some limitations in data sets. This book discusses the selection and separation of data sets, performance evaluation parameters for different types of concrete and related materials, and sensitivity analysis related to various CI techniques. Fundamental concepts and essential analysis for CI techniques such as artificial neural network, fuzzy system, support vector machine, and how they work together for resolving real-life problems, are explained. Features: It is the first book on this fast-growing research field. It discusses the use of various computation intelligence techniques in concrete technology applications. It explains the effectiveness of the methods used and the wide range of available techniques. It integrates a wide range of disciplines from civil engineering, construction technology, and concrete technology to computation intelligence, soft computing, data science, computer science, and so on. It brings together the experiences of contributors from around the world who are doing research in this field and explores the different aspects of their research. The technical content included is beneficial for researchers as well as practicing engineers in the concrete and construction industry. The book is about logical analysis of natural language. Since we humans communicate by means of natural language, we need

a tool that helps us to understand in a precise manner how the logical and formal mechanisms of natural language work. Moreover, in the age of computers, we need to communicate both with and through computers as well. Transparent Intensional Logic is a tool that is helpful in making our communication and reasoning smooth and precise. It deals with all kinds of linguistic context in a fully compositional and anti-contextual way. Workflow management systems support the execution of business processes: they require the modeling of the processes, they drive the actual enactment of process instances, and they document the business process execution. Many different modeling languages and systems have been developed for the design and representation of business processes and workflows as a consequence of different requirements, different purposes, as well as different schools and modeling philosophies. The differences are partly on a conceptual level in the sense that the modeling languages offer different concepts and constructs, and partly on the representation level where basically the same constructs are represented differently (e.g. text- or graph-based). This book makes two important contributions to workflow modeling. Firstly, it provides a metamodel based on abstract modeling concepts, which copes with representation differences of workflow descriptions. Secondly, it introduces a set of equivalence transformations on workflow models. Such transformations are an important tool for workflow developments as they allow representing workflows differently for different purposes. These transformations are used in algorithms for checking the satisfiability of temporal constraints in workflow definitions. Using this apparatus made it possible to develop a sophisticated time management system for workflows, which not only checks temporal constraints but can also be used to develop time plans for workflow execution. This volume contains nineteen research papers belonging to the areas of computational statistics, data mining, and their applications. Those papers, all written specifically for this volume, are their authors' contributions to honour and celebrate Professor Jacek Koronacki on the occasion of his 70th birthday. The book's related and often interconnected topics, represent Jacek Koronacki's research interests and their evolution. They also clearly indicate how close the areas of computational statistics and data mining are. Die KiVS als die deutschsprachige Konferenz im Bereich der "Kommunikation in Verteilten Systemen" befaßt sich mit allen Aspekten der verteilten Systeme, den Anwendungen verteilter Systeme sowie den zugrunde liegenden Kommunikationstechnologien. Aus gut 90 eingereichten Beiträgen hat der Programmausschuß 39 Artikel zur Präsentation ausgewählt. Zusammen mit den Tutorials zu Sicherheit, Mobilität und multimediales Lernen bieten die beiden Arbeitsgespräche zu "Infrastrukturen für Electronic Commerce" und "Active Networks und Dienstgüte" hochaktuelle Foren des Wissensaustauschs. This book focus on innovation, main objectives are to bring the community of researchers in the fields of mechanical design together; to exchange and discuss the most recent investigations, challenging problems and new trends; and to encourage the wider implementation of the advanced design technologies and tools in the world, particularly throughout China. The theme of 2021 ICMD is "Interdisciplinary and Design Innovation" and this conference is expected to provide an excellent forum for cross-fertilization of ideas so that more general, intelligent, robust and computationally economical mechanical design methods are created for multi-disciplinary applications. Even in the age of ubiquitous computing, the importance of the Internet will not change and we still need to solve conventional security issues. In addition, we need to deal with new issues such as security in the P2P environment, privacy issues in the use of smart cards, and RFID systems. Security and Privacy in the Age of Ubiquitous Computing addresses these issues and more by exploring a wide scope of topics. The volume presents a selection of papers from the proceedings of the 20th IFIP International Information Security Conference held from May 30 to June 1, 2005 in Chiba, Japan. Topics covered include cryptography applications, authentication, privacy and anonymity, DRM and content security, computer forensics, Internet and web security, security in sensor networks, intrusion detection, commercial and industrial security, authorization and access control, information warfare and critical protection infrastructure. These papers represent the most current research in information security, including research funded in part by DARPA and the National Science Foundation. Worldwide there is a growing interest in efficient planning and the design, construction and maintenance of transportation facilities and infrastructure assets. The 3rd International Conference on Transportation Infrastructure ICTI 2014 (Pisa, April 22-25, 2014) contains contributions on sustainable development and preservation of transportation infrastructure assets, with a focus on eco-efficient and cost-effective measures.

Sustainability, Eco-efficiency and Conservation in Transportation Infrastructure Asset Management includes a selection of peer reviewed papers on a wide variety of topics: • Advanced modeling tools (LCA, LCC, BCA, performance prediction, design tools and systems) • Data management (monitoring and evaluation) • Emerging technologies and equipments • Innovative strategies and practices • Environmental sustainability issues • Eco-friendly design and materials • Re-use or recycling of resources • Pavements, tracks, and structures • Case studies Sustainability, Eco-efficiency and Conservation in Transportation Infrastructure Asset Management will be particularly of interest to academics, researchers, and practitioners involved in sustainable development and maintenance of transportation infrastructure assets. This book aims to attract researchers and practitioners who are working in information technology and computer science. This edited book is about basics and high-level concepts regarding blockchain technology and application, multimedia security, information processing, security of network, cloud and IoT, cryptography and information hiding, cyber-security and evidence investigations, and learning and intelligent computing. It is becoming increasingly important to develop adaptive, intelligent computing-centric, energy-aware, secure, and privacy-aware mechanisms in high-performance computing and IoT applications. The book serves as a useful guide for industry persons and also helps beginners to learn things from basic to advance in the area of better computing paradigm. Our aim is intended to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results in security-related areas. We believe that this book not only presents novel and interesting ideas but also will stimulate interesting discussions from the participants and inspire new ideas. © Kia Carens BMW Concept XM Porsche Vision Gran Turismo Lexus RZ 450e Nissan Ariya Single Seater Concept ●11—●F1—2021F1●+GPS Mio Mivue R750D ● BMW M4 G82 Kia Carnival AG Road Test Lexus NX 350h Honda Fit e:HEV Hyundai Tucson L Skoda Kodiaq TSI A new benchmark in BMW M3. The BMW M3 is a high-performance variant of the BMW 3-Series, elaborated by BMW's In-house motorsport division, BMW M. M3 types have been obtained as of the E30, E36, E46 and E90/E92/E93 3-series, and traded with coupe, saloon and convertible form methods. Upgrades over the 'standard' 3-Series cars contain further strong and reactive motors, ameliorated handling/suspension/braking setups, aerodynamic form advancements, and interior/exterior accents with the tri-colour 'M' (Motorsport) symbol. Over the annums the M3 and M5 have come to be the point of reference means of transport versus that nearly all athletics sedans in its grade are contrasted notwithstanding contention as of Mercedes-AMG and Audi Quattro GmbH (Audi RS). The final M3 coupe spinned off the gathering row in Germany on five July 2013. The M3 designation tend to stay with the sedan, however the coupe model tend to be substituted by the M4 starting with the 2014 model annum. There has never been a BMW M3 Guide like this. It contains 49 answers, much more than you can imagine; comprehensive answers and extensive details and references, with insights that have never before been offered in print. Get the information you need--fast! This all-embracing guide offers a thorough view of key knowledge and detailed insight. This Guide introduces what you want to know about BMW M3. A quick look inside of some of the subjects covered: BMW M30 - Turbocharging, BMW M3 - M3 GT, BMW M3 - E46 performance, BMW M3 - E92 M3 GTS, BMW M3 - E36 M3, BMW M3 - E36 performance, BMW M3 - M3 Evolution Imola Individual (M3 GT2), BMW M3 - E92 M3 GT2, BMW M3 - North American models, BMW M3 - F80 M3, BMW M30 - 2.5 litre, BMW M3 - M3 Euro-Spec (Canadian Edition), BMW M30 - Development, BMW M3 - E92 M3 Lime Rock Park Edition, BMW M3 - M3 CS (Competition Package), BMW M30 - Motorsport, BMW M3 - Wrap up, BMW M3 - E92 M3 DTM Champion Edition, BMW M3 - Races, and much more... During the 1980s, functional organic devices were born. For nearly twenty years, organic semiconductor technology has largely been the domain of traditional players within the microelectronics world, involving semiconductor companies, research laboratories, and government organizations. The print industry, a well-established community who shaped much of the Second Millennium, has joined the organic electronics quest during these first few years of the Third Millennium. This seemingly unlikely marriage of two worlds, the microelectronics and graphic print industries, shows incredible promise to spawn an entirely new method of electronics manufacture and, ultimately, whole new industries. The enhancements

of organic semiconductor materials seen during the late 1990s and early 2000s have resulted in the fabrication of organic electronics in laboratory environments with impressive performance. Since the early 2000s, scientists have succeeded in applying printing-related technologies to create organic field effect transistors (OFETs) with micron-sized features. This has led to a widespread vision of developing printed electronic products, especially displays, sensors, and simple wireless products (such as RFID tags). The development of high-volume manufacturing platforms based on traditional graphic arts printing platforms naturally addresses demands on product cost and throughput. Moreover, graphics art printing technologies allow one to fabricate organic circuits directly onto low-cost sheet or roll substrates, including plastics and paper. Printed Organic And Molecular Electronics was compiled to create a reference that included existing knowledge from the most renowned industry, academic, and government experts in the fields of organic semiconductor technology, graphic arts printing, micro-contact printing, and molecular electronics. It is divided into sections that consist of the most critical topics required for one to develop a strong understanding of the states of these technologies and the paths for taking them from R&D to the hands of consumers on a massive scale. As such, the book provides both theory as well as technology development results and trends. This book constitutes the thoroughly refereed proceedings of the Second Iberoamerican Conference, KGSWC 2020, held in Mérida, Mexico, in November 2020. Due to the COVID-19 pandemic the conference was held online. The 15 papers presented were carefully reviewed and selected from 45 submissions. The papers cover research and practices in several fields of AI, such as knowledge representation and reasoning, natural language processing/text mining, machine/deep learning, semantic web, and knowledge graphs. With computers becoming embedded as controllers in everything from network servers to the routing of subway schedules to NASA missions, there is a critical need to ensure that systems continue to function even when a component fails. In this book, bestselling author Martin Shooman draws on his expertise in reliability engineering and software engineering to provide a complete and authoritative look at fault tolerant computing. He clearly explains all fundamentals, including how to use redundant elements in system design to ensure the reliability of computer systems and networks. Market: Systems and Networking Engineers, Computer Programmers, IT Professionals. As MOS devices are scaled to meet increasingly demanding circuit specifications, process variations have a greater effect on the reliability of circuit performance. For this reason, statistical techniques are required to design integrated circuits with maximum yield. Statistical Modeling for Computer-Aided Design of MOS VLSI Circuits describes a statistical circuit simulation and optimization environment for VLSI circuit designers. The first step toward accomplishing statistical circuit design and optimization is the development of an accurate CAD tool capable of performing statistical simulation. This tool must be based on a statistical model which comprehends the effect of device and circuit characteristics, such as device size, bias, and circuit layout, which are under the control of the circuit designer on the variability of circuit performance. The distinctive feature of the CAD tool described in this book is its ability to accurately model and simulate the effect in both intra- and inter-die process variability on analog/digital circuits, accounting for the effects of the aforementioned device and circuit characteristics. Statistical Modeling for Computer-Aided Design of MOS VLSI Circuits serves as an excellent reference for those working in the field, and may be used as the text for an advanced course on the subject. Discover the concepts, architectures, components, tools, and techniques needed to design millimeter-wave circuits for current and emerging wireless system applications. Focusing on applications in 5G, connectivity, radar, and more, leading experts in radio frequency integrated circuit (RFIC) design provide a comprehensive treatment of cutting-edge physical-layer technologies for radio frequency (RF) transceivers - specifically RF, analog, mixed-signal, and digital circuits and architectures. The full design chain is covered, from system design requirements through to building blocks, transceivers, and process technology. Gain insight into the key novelties of 5G through authoritative chapters on massive MIMO and phased arrays, and learn about the very latest technology developments, such as FinFET logic process technology for RF and millimeter-wave applications. This is an essential reading and an excellent reference for high-frequency circuit designers in both academia and industry. Index is composed of 3 sections: Basic classifications subject, Current VA directives, and Rescinded VA directives. This book is about learning from data using the Generalized Additive Models for Location, Scale and Shape (GAMLSS). GAMLSS extends the Generalized Linear Models (GLMs) and

Generalized Additive Models (GAMs) to accommodate large complex datasets, which are increasingly prevalent. In particular, the GAMLSS statistical framework enables flexible regression and smoothing models to be fitted to the data. The GAMLSS model assumes that the response variable has any parametric (continuous, discrete or mixed) distribution which might be heavy- or light-tailed, and positively or negatively skewed. In addition, all the parameters of the distribution (location, scale, shape) can be modelled as linear or smooth functions of explanatory variables. Key Features: Provides a broad overview of flexible regression and smoothing techniques to learn from data whilst also focusing on the practical application of methodology using GAMLSS software in R. Includes a comprehensive collection of real data examples, which reflect the range of problems addressed by GAMLSS models and provide a practical illustration of the process of using flexible GAMLSS models for statistical learning. R code integrated into the text for ease of understanding and replication. Supplemented by a website with code, data and extra materials. This book aims to help readers understand how to learn from data encountered in many fields. It will be useful for practitioners and researchers who wish to understand and use the GAMLSS models to

learn from data and also for students who wish to learn GAMLSS through practical examples. Providing a succinct introduction to the systemization, noise sources, and signal processes of image sensor technology, Essential Principles of Image Sensors discusses image information and its four factors: space, light intensity, wavelength, and time. Featuring clarifying and insightful illustrations, this must-have text: Explains how image sensors convert optical image information into image signals Treats space, wavelength, and time as digitized built-in coordinate points in image sensors and systems Details the operational principles, pixel technology, and evolution of CCD, MOS, and CMOS sensors with updated technology Describes sampling theory, presenting unique figures demonstrating the importance of phase Explores causes for the decline of image information quality In a straightforward manner suitable for beginners and experts alike, Essential Principles of Image Sensors covers key topics related to digital imaging including semiconductor physics, component elements necessary for image sensors, silicon as a sensitive material, noises in sensors, and more.