Estimation Of Curvatures In Point Sets Based On Geometric

The refereed proceedings of the 12th International Conference on Computer Analysis of Images and Patterns are presented in this volume. The papers cover motion detection and tracking, medical imaging, biometrics, color, curves and surfaces beyond two dimensions, reading characters, words and lines, image segmentation, shape, image registration and matching, signal decomposition and invariants, and features and classification.

Geometric Modeling and Scientific Visualization are both established disciplines, each with their own series of workshops, conferences and journals. But clearly both disciplines overlap; this observation led to the idea of composing a book on Geometric Modeling for Scientific Visualization.

The six-volume set comprising LNCS volumes 6311 until 6313 constitutes the refereed proceedings of the 11th European Conference on Computer Vision, ECCV 2010, held in Heraklion, Crete, Greece, in September 2010. The 325 revised papers presented were carefully reviewed and selected from 1174 submissions. The papers are organized in topical sections on object and scene recognition; segmentation and grouping; face, gesture, biometrics; motion and tracking; statistical models and visual learning; matching, registration, alignment; computational imaging; multi-view geometry; image features; video and event characterization; shape representation and recognition; stereo; reflectance, illumination, color; medical image analysis.

With a lot of recent developments in the field, this much-needed book has come at just the right time. It covers a variety of topics related to preserving and enhancing shape information at a geometric level. The contributors also cover subjects that are relevant to effectively capturing the structure of a shape by identifying relevant shape components and their mutual relationships.

This book, which presents the peer-reviewed post-proceedings of CSNDD 2012 and CSNDD 2014, addresses the important role that relevant concepts and tools from nonlinear and complex dynamics could play in present and future engineering applications. It includes 22 chapters contributed by outstanding researchers and covering various aspects of applications, including: structural health monitoring, diagnosis and damage detection, experimental methodologies, active vibration control and smart structures, passive control of structures using nonlinear energy sinks, vibro-impact dynamic MEMS/NEMS/AFM, energy-harvesting materials and structures, and time-delayed feedback control, as well as aspects of deterministic versus stochastic dynamics and control of nonlinear phenomena in physics. Researchers and engineers interested in the challenges posed and opportunities offered by nonlinearities in the development of passive and active control strategies, energy harvesting, novel design criteria, modeling and characterization will find the book to be an outstanding introduction.

This book constitutes the refereed proceedings of the 6th International Conference on Convergence and Hybrid Information Technology, ICHIT 2012, held in Daejeon, Korea, in August 2012. The 102 revised full papers presented were carefully reviewed and selected from 196 submissions. The papers are organized in topical sections on communications and networking; soft computing and intelligent systems; medical information and bioinformatics; security and safety systems; HCI and data mining;

software and hardware engineering; image processing and pattern recognition; robotics and RFID technologies; convergence in information technology; workshop on advanced smart convergence (IWASC).

This volume includes extended and revised versions of a set of selected papers from the International Conference on Electric and Electronics (EEIC 2011) , held on June 20-22 , 2011, which is jointly organized by Nanchang University, Springer, and IEEE IAS Nanchang Chapter. The objective of EEIC 2011 Volume 4 is to provide a major interdisciplinary forum for the presentation of new approaches from Communication Systems and Information Technology, to foster integration of the latest developments in scientific research. 137 related topic papers were selected into this volume. All the papers were reviewed by 2 program committee members and selected by the volume editor Prof. Ming Ma. We hope every participant can have a good opportunity to exchange their research ideas and results and to discuss the state of the art in the areas of the Communication Systems and Information Technology.

Topology-based methods are of increasing importance in the analysis and visualization of datasets from a wide variety of scientific domains such as biology, physics, engineering, and medicine. Current challenges of topology-based techniques include the management of time-dependent data, the representation of large and complex datasets, the characterization of noise and uncertainty, the effective integration of numerical methods with robust combinatorial algorithms, etc. . The editors have brought together the most prominent and best recognized researchers in the field of topology-based data analysis and visualization for a joint discussion and scientific exchange of the latest results in the field. This book contains the best 20 peer-reviewed papers resulting from the discussions and presentations at the third workshop on "Topological Methods in Data Analysis and Visualization", held 2009 in Snowbird, Utah, US. The 2009 "TopoInVis" workshop follows the two successful workshops in 2005 (Slovakia) and 2007 (Germany).

This book constitutes the refereed proceedings of the 11th Iberoamerican Congress on Pattern Recognition, CIARP 2006, held in Cancun, Mexico in November 2006. The 99 revised full papers presented together with three keynote articles were carefully reviewed and selected from 239 submissions. The papers cover ongoing research and mathematical methods.

The four volume set assembled following The 2005 International Conference on Computational Science and its Applications, ICCSA 2005, held in Suntec International Convention and Exhibition Centre, Singapore, from 9 May 2005 till 12 May 2005, represents the ?ne collection of 540 refereed papers selected from nearly 2,700 submissions. Computational Science has ?rmly established itself as a vital part of many scienti?c investigations, a?ecting researchers and practitioners in areas ranging from applications such as aerospace and automotive, to emerging technologies such as bioinformatics and nanotechnologies, to core disciplines such as ma- ematics, physics, and chemistry. Due to the shear size of many challenges in computational science, the use of supercomputing, parallel processing, and - phisticated algorithms is inevitable and becomes a part of fundamental t- oretical research as well as endeavors in emerging ?elds. Together, these far reaching scienti?c areas contribute to shape this Conference in the realms of state-of-the-art computational science research and applications, encompassing the facilitating theoretical foundations and the innovative applications of such results in other areas.

By discussing topics such as shape representations, relaxation theory and optimal transport, trends and synergies of mathematical tools required for optimization of geometry and topology of shapes are explored. Furthermore, applications in science and engineering, including economics, social sciences, biology, physics and image processing are covered. Contents Part I Geometric issues in PDE problems related

to the infinity Laplace operator Solution of free boundary problems in the presence of geometric uncertainties Distributed and boundary control problems for the semidiscrete Cahn–Hilliard/Navier–Stokes system with nonsmooth Ginzburg–Landau energies High-order topological expansions for Helmholtz problems in 2D On a new phase field model for the approximation of interfacial energies of multiphase systems Optimization of eigenvalues and eigenmodes by using the adjoint method Discrete varifolds and surface approximation Part II Weak Monge–Ampere solutions of the semi-discrete optimal transportation problem Optimal transportation theory with repulsive costs Wardrop equilibria: long-term variant, degenerate anisotropic PDEs and numerical approximations On the Lagrangian branched transport model and the equivalence with its Eulerian formulation On some nonlinear evolution systems which are perturbations of Wasserstein gradient flows Pressureless Euler equations with maximal density constraint: a time-splitting scheme Convergence of a fully discrete variational scheme for a thin-film equatio Interpretation of finite volume discretization schemes for the Fokker–Planck equation as gradient flows for the discrete Wasserstein distance

The volume set LNAI 11740 until LNAI 11745 constitutes the proceedings of the 12th International Conference on Intelligent Robotics and Applications, ICIRA 2019, held in Shenyang, China, in August 2019. The total of 378 full and 25 short papers presented in these proceedings was carefully reviewed and selected from 522 submissions. The papers are organized in topical sections as follows: Part I: collective and social robots; human biomechanics and human-centered robotics; robotics for cell manipulation and characterization; field robots; compliant mechanisms; robotic grasping and manipulation with incomplete information and strong disturbance; human-centered robotics; development of high-performance joint drive for robots; modular robots and other mechatronic systems; compliant manipulation learning and control for lightweight robot. Part II: power-assisted system and control; bio-inspired wall climbing robot; underwater acoustic and optical signal processing for environmental cognition; piezoelectric actuators and micro-nano manipulations; robot vision and scene understanding; visual and motional learning in robotics; signal processing and underwater bionic robots; soft locomotion robot; teleoperation robot; autonomous control of unmanned aircraft systems. Part III: marine bio-inspired robotics and soft robotics: materials, mechanisms, modelling, and control; robot intelligence technologies and system integration; continuum mechanisms and robots; unmanned underwater vehicles; intelligent robots for environment detection or fine manipulation; parallel robotics; human-robot collaboration; swarm intelligence and multi-robot cooperation; adaptive and learning control system; wearable and assistive devices and robots for healthcare; nonlinear systems and control. Part IV: swarm intelligence unmanned system; computational intelligence inspired robot navigation and SLAM; fuzzy modelling for automation, control, and robotics; development of ultra-thin-film, flexible sensors, and tactile sensation; robotic technology for deep space exploration; wearable sensing based limb motor function rehabilitation; pattern recognition and machine learning; navigation/localization. Part V: robot legged locomotion; advanced measurement and machine vision system; man-machine interactions; fault detection, testing and diagnosis; estimation and identification; mobile robots and intelligent autonomous systems; robotic vision, recognition and reconstruction; robot mechanism and design. Part VI: robot motion analysis and planning; robot design, development and control; medical robot; robot intelligence, learning and linguistics; motion control; computer integrated manufacturing; robot cooperation; virtual and augmented reality; education in mechatronics engineering; robotic drilling and sampling technology; automotive systems; mechatronics in energy systems; human-robot interaction.

The 30-volume set, comprising the LNCS books 12346 until 12375, constitutes the refereed proceedings of the 16th European Conference on Computer Vision, ECCV 2020, which was planned to be held in Glasgow, UK, during August 23-28, 2020. The conference was held

virtually due to the COVID-19 pandemic. The 1360 revised papers presented in these proceedings were carefully reviewed and selected from a total of 5025 submissions. The papers deal with topics such as computer vision; machine learning; deep neural networks; reinforcement learning; object recognition; image classification; image processing; object detection; semantic segmentation; human pose estimation; 3d reconstruction; stereo vision; computational photography; neural networks; image coding; image reconstruction; object recognition; motion estimation.

These notes were the basis for a series of ten lectures given in January 1984 at Polytechnic Institute of New York under the sponsorship of the Conference Board of the Mathematical Sciences and the National Science Foundation. The lectures were aimed at mathematicians who knew either some differential geometry or partial differential equations, although others could understand the lectures. Author's Summary:Given a Riemannian Manifold (M,g) one can compute the sectional, Ricci, and scalar curvatures. In other special circumstances one also has mean curvatures, holomorphic curvatures, etc. The inverse problem is, given a candidate for some curvature, to determine if there is some metric g with that as its curvature. One may also restrict ones attention to a special class of metrics, such as Kahler or conformal metrics, or those coming from an embedding. These problems lead one to (try to) solve nonlinear partial differential equations. However, there may be topological or analytic obstructions to solving these equations. A discussion of these problems thus requires a balanced understanding between various existence and non-existence results. The intent of this volume is to give an up-to-date survey of these questions, including enough background, so that the current research literature is accessible to mathematicians who are not necessarily experts in PDE or differential geometry. The intended audience is mathematicians and graduate students who know either PDE or differential geometry at roughly the level of an intermediate graduate course.

The three volume set LNCS 5994, LNCS 5995, and LNCS 5996 constitutes the thoroughly refereed post-conference proceedings of the 9th Asian Conference on Computer Vision, ACCV 2009, held in Xi'an, China, in September 2009. The 35 revised full papers and 130 revised poster papers of the three volumes were carefully reviewed and seleceted from 670 submissions. The papers are organized in topical sections on multiple view and stereo, face and pose analysis, motion analysis and tracking, segmentation, feature extraction and object detection, image enhancement and visual attention, machine learning algorithms for vision, object categorization and face recognition, biometrics and surveillance, stereo, motion analysis, and tracking, segmentation, detection, color and texture, as well as machine learning, recognition, biometrics and surveillance.

This book constitutes the refereed proceedings of the First Pacific Rim Symposium on Image and Video Technology, PSIVT 2006, held in Hsinchu, Taiwan in December 2006. The 76 revised full papers and 58 revised poster papers cover a wide range of topics, including all aspects of video and multimedia, both technical and artistic perspectives and both theoretical and practical issues.

The book written by Dr. Radu B. Rusu presents a detailed description of 3D Semantic Mapping in the context of mobile robot manipulation. As autonomous robotic platforms get more sophisticated manipulation capabilities, they also need more expressive and comprehensive environment models that include the objects present in the world, together with their position, form, and other semantic aspects, as well as interpretations of these objects with respect to the robot tasks. The book proposes novel 3D feature representations called Point Feature Histograms (PFH), as well as a frameworks for the acquisition and processing of Semantic

3D Object Maps with contributions to robust registration, fast segmentation into regions, and reliable object detection, categorization, and reconstruction. These contributions have been fully implemented and empirically evaluated on different robotic systems, and have been the original kernel to the widely successful open-source project the Point Cloud Library (PCL) -- see http://pointclouds.org.

This volume constitutes the refereed proceedings of the 11th International Workshop on Combinatorial Image Analysis, IWCIA 2006, held in Berlin, June 2006. The book presents 34 revised full papers together with two invited papers, covering topics including combinatorial image analysis; grammars and models for analysis and recognition of scenes and images; combinatorial topology and geometry for images; digital geometry of curves and surfaces; algebraic approaches to image processing, and more.

This book constitutes the refereed proceedings of the Third International Conference on Scale-Space and Morphology in Computer Vision, Scale-Space 2001, held in Vancouver, Canada in July 2001. The 18 revised full papers presented together with 23 posters were carefully reviewed and selected from 60 submissions. The book addresses all current aspects of scale-space and morphology in the context of computer vision, in particular, vector distance functions, optic flow, image registration, curve evolution, morphological segmentation, scalar images, vector images, automatic scale selection, geometric diffusion, diffusion filtering, image filtering, inverse problems, active contours, etc.

Free Surface Flow: Environmental Fluid Mechanics introduces a wide range of environmental fluid flows, such as water waves, land runoff, channel flow, and effluent discharge. The book provides systematic analysis tools and basic skills for study fluid mechanics in natural and constructed environmental flows. As the prediction of changes in free surfaces in rivers, lakes, estuaries and in the ocean directly affects the design of structures that control surface waters, and because planning for the allocation of fresh-water resources in a sustainable manner is an essential goal, this book provides the necessary background and research. Helps users determine the transfer of solute mass through the air-water interface Presents tactics on the impact of free shear flow in the environment and how to quantify mixing mechanisms in turbulent jets and wakes Gives users tactics to predict the fate and transport of contaminants in stratified lakes and estuaries

Used by companies, organizations, and even individuals to promote recognition of their brand, logos can also act as a valuable means of identifying the source of a document. E-business applications can retrieve and catalog products according to their logos. Governmental agencies can easily inspect goods using smart mobile devices that use logo recognition techniques. However, because logos are two-dimensional shapes of varying complexity, the recognition process can be challenging. Although promising results have been found for clean logos, they have not been as robust for noisy logos. Logo Recognition: Theory and Practice is the first book to focus on logo recognition, especially under noisy conditions. Beginning with an introduction to fundamental concepts and methods in pattern and shape recognition, it surveys advances in logo recognition. The authors also propose a new logo recognition system that can be used under adverse conditions such as broken lines, added noise, and occlusion. The proposed system introduces a novel polygonal approximation, a robust indexing scheme, and a new line segment Hausdorff

distance (LHD) matching method that can handle more distortion and transformation types than previous techniques. In the first stage, raw logos are transformed into normalized line segment maps. In the second stage, effective line pattern features are used to index the database to generate a moderate number of likely models. In the third stage, an improved LHD measure screens and generates the best matches. A comprehensive overview of logo recognition, the book also presents successful applications of the technology and suggests directions for future research.

Cell mechanics is the field of study that looks at how cells detect, modify, and respond to the physical properties of the cell environment. Cells communicate with each other through chemical and physical signals which are involved in a range of process from embryogenesis and wound healing to pathological conditions such as cancerous invasion. Similar principles are also likely to be critical for success in regenerative medicine. Cell mechanics is thus central to understanding these principles. As cell mechanics draws from the fields of biology, chemistry, physics, engineering, and mathematics, this book aims not only to provide a collection of research methods, but also to develop a common language among scientists who share the interest in cell mechanics but enter the field with diverse backgrounds. To this end all of the contributing authors have sought to explain in plain language the nature of the biological problems, the rationale for the approaches, in addition to the methods themselves. In addition, to balance practical utility against conceptual advances, Cell Mechanics has intentionally included both chapters that provide detailed recipes and those that emphasize basic principles. Presents a distinctive emphasis on matrix mechanics and their interplay with cell functions Includes highly significant topics relevant to basic and translational research, as well as tissue engineering Emphasizes mechanical input and output of cells

MPEG-7 is the first international standard which contains a number of key techniques from Computer Vision and Image Processing. The Curvature Scale Space technique was selected as a contour shape descriptor for MPEG-7 after substantial and comprehensive testing, which demonstrated the superior performance of the CSS-based descriptor. Curvature Scale Space Representation: Theory, Applications, and MPEG-7 Standardization is based on key publications on the CSS technique, as well as its multiple applications and generalizations. The goal was to ensure that the reader will have access to the most fundamental results concerning the CSS method in one volume. These results have been categorized into a number of chapters to reflect their focus as well as content. The book also includes a chapter on the development of the CSS technique within MPEG standardization, including details of the MPEG-7 testing and evaluation processes which led to the selection of the CSS shape descriptor for the standard. The book can be used as a supplementary textbook by any university or institution offering courses in computer and information science.

On behalf of the organizing committee, we would like to welcome you to Da- nd stadt and DAGM 2010,the 32 Annual Symposium of the German Association for Pattern Recognition. The technical program covered all aspects of pattern recognition and, to name only a few areas, ranged from 3D reconstruction, to object recognition and medical applications. The result is re?ected in these proceedings, which contain the papers presented at DAGM 2010. Our call for papers resulted in 134 submissions from institutions

in 21 countries. Each paper underwent a rigorous reviewing process and was assigned to at least three program committee m-bers for review. The reviewing phase was followed by a discussion phase among the respective program committee members in order to suggest papers for - ceptance. The ?nal decision was taken during a program committee meeting held in Darmstadt based on all reviews, the discussion results and, if necessary, additional reviewing. Based on this rigorous process we selected a total of 57 papers, corresponding to an acceptance rate of below 45%. Out of all accepted papers, 24 were chosen for oral and 33 for poster presentation. All accepted - pers have been published in these proceedings and given the same number of pages. We would like to thank all members of the program committee as well as the external reviewers for their valuable and highly appreciated contribution to the community.

This book provides a valuable glimpse into discrete curvature, a rich new field of research which blends discrete mathematics, differential geometry, probability and computer graphics. It includes a vast collection of ideas and tools which will offer something new to all interested readers. Discrete geometry has arisen as much as a theoretical development as in response to unforeseen challenges coming from applications. Discrete and continuous geometries have turned out to be intimately connected. Discrete curvature is the key concept connecting them through many bridges in numerous fields: metric spaces, Riemannian and Euclidean geometries, geometric measure theory, topology, partial differential equations, calculus of variations, gradient flows, asymptotic analysis, probability, harmonic analysis, graph theory, etc. In spite of its crucial importance both in theoretical mathematics and in applications, up to now, almost no books have provided a coherent outlook on this emerging field.

Non-Linear Estimation is a handbook for the practical statistician or modeller interested in fitting and interpreting non-linear models with the aid of a computer. A major theme of the book is the use of 'stable parameter systems'; these provide rapid convergence of optimization algorithms, more reliable dispersion matrices and confidence regions for parameters, and easier comparison of rival models. The book provides insights into why some models are difficult to fit, how to combine fits over different data sets, how to improve data collection to reduce prediction variance, and how to program particular models to handle a full range of data sets. The book combines an algebraic, a geometric and a computational approach, and is illustrated with practical examples. A final chapter shows how this approach is implemented in the author's Maximum Likelihood Program, MLP.

The COPROMAPH Conference series has now evolved into a significant international arena where fundamental concepts in mathematical and theoretical physics and their physics applications can be conceived, developed and disseminated. Basic ideas for addressing a variety of contemporary problems in mathematical and theoretical physics are presented in a nonintimidating atmosphere. Experts provide the reader the fundamentals to predict new possibilities in physics and other fields.The proceedings have been selected for coverage in: ? Index to Scientific & Technical Proceedings? (ISTP? / ISI Proceedings)? Index to Scientific & Technical Proceedings (ISTP CDROM version / ISI Proceedings)? CC Proceedings ? Engineering & Physical Sciences Intelligent Robotics and Applications12th International Conference, ICIRA 2019, Shenyang, China, August 8–11, 2019, Proceedings, Part VSpringer

The Larson Calculus program has a long history of innovation in the calculus market. It has been widely praised by a generation of students and professors for its solid and effective pedagogy that addresses the needs of a broad range of teaching and learning styles and environments. Each title is just one component in a comprehensive calculus course program that carefully integrates and coordinates print, media, and technology products for successful teaching and learning. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

3D Face Modeling, Analysis and Recognition presentsmethodologies for analyzing shapes of facial surfaces, developscomputational tools for analyzing 3D face data, and illustratesthem using state-of-the-art applications. The methodologies chosenare based on efficient representations, metrics, comparisons, andclassifications of features that are especially relevant in thecontext of 3D measurements of human faces. These frameworks have along-term utility in face analysis, taking into account theanticipated improvements in data collection, data storage,processing speeds, and application scenarios expected as thediscipline develops further. The book covers face acquisition through 3D scanners and 3D facepre-processing, before examining the three main approaches for 3Dfacial surface analysis and recognition: facial curves; facialsurface features; and 3D morphable models. Whilst the focus ofthese chapters is fundamentals and methodologies, the algorithmsprovided are tested on facial biometric data, thereby continuallyshowing how the methods can be applied. Key features: • Explores the underlying mathematics and will apply thesemathematical techniques to 3D face analysis and recognition • Provides coverage of a wide range of applications includingbiometrics, forensic applications, facial expression analysis, andmodel fitting to 2D images • Contains numerous exercises and algorithms throughout thebook

Geometric Modelling is concerned with the computer aided design, manipulation, storage and transmission of geometric shape. It provides fundamental techniques to different areas of application as CAD/CAM, computer graphics, scientific visualization, and virtual Reality. 20 papers presented by leading experts give a state-of-the-art survey of the following topics: surface design and fairing; multiresolution models; reverse engineering; solid modelling; constrained based modelling.

The three-volume set, consisting of LNCS 9008, 9009, and 9010, contains carefully reviewed and selected papers presented at 15 workshops held in conjunction with the 12th Asian Conference on Computer Vision, ACCV 2014, in Singapore, in November 2014. The 153 full papers presented were selected from numerous submissions. LNCS 9008 contains the papers selected for the Workshop on Human Gait and Action Analysis in the Wild, the Second International Workshop on Big Data in 3D Computer Vision, the Workshop on Deep Learning on Visual Data, the Workshop on Scene

Understanding for Autonomous Systems, and the Workshop on Robust Local Descriptors for Computer Vision. LNCS 9009 contains the papers selected for the Workshop on Emerging Topics on Image Restoration and Enhancement, the First International Workshop on Robust Reading, the Second Workshop on User-Centred Computer Vision, the International Workshop on Video Segmentation in Computer Vision, the Workshop: My Car Has Eyes: Intelligent Vehicle with Vision Technology, the Third Workshop on E-Heritage, and the Workshop on Computer Vision for Affective Computing. LNCS 9010 contains the papers selected for the Workshop on Feature and Similarity for Computer Vision, the Third International Workshop on Intelligent Mobile and Egocentric Vision, and the Workshop on Human Identification for Surveillance.

In this book we have grouped contributions in 28 chapters from several authors all around the world on the several aspects and challenges of research and applications of robots with the aim to show the recent advances and problems that still need to be considered for future improvements of robot success in worldwide frames. Each chapter addresses a specific area of modeling, design, and application of robots but with an eye to give an integrated view of what make a robot a unique modern system for many different uses and future potential applications. Main attention has been focused on design issues as thought challenging for improving capabilities and further possibilities of robots for new and old applications, as seen from today technologies and research programs. Thus, great attention has been addressed to control aspects that are strongly evolving also as function of the improvements in robot modeling, sensors, servo-power systems, and informatics. But even other aspects are considered as of fundamental challenge both in design and use of robots with improved performance and capabilities, like for example kinematic design, dynamics, vision integration.

Visual sensors are able to capture a large quantity of information from the environment around them. A wide variety of visual systems can be found, from the classical monocular systems to omnidirectional, RGB-D, and more sophisticated 3D systems. Every configuration presents some specific characteristics that make them useful for solving different problems. Their range of applications is wide and varied, including robotics, industry, agriculture, quality control, visual inspection, surveillance, autonomous driving, and navigation aid systems. In this book, several problems that employ visual sensors are presented. Among them, we highlight visual SLAM, image retrieval, manipulation, calibration, object recognition, navigation, etc.

Twenty-six long papers and 76 short papers selected for presentation at ICCV, held December 1990, Osaka, Japan, comprise this collection. They are organized according to conference sessions covering reflection, programming, image flow, matching, motion, features, object recognition, and shape. No su

Copyright: 3c14e3098a827afecb713107e84a2249