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Activity Understanding and Unusual Event Detection in Surveillance Videos Robust Event Detection and Retrieval in Surveillance Video Anomalous Event Detection from Surveillance Video Censorship, Surveillance, and Privacy: Concepts, Methodologies, Tools, and Applications Abnormal Event Detection in Surveillance Videos Using Two-Stream Decoder Event Detection and Modelling for Security Application Advances in Artificial Intelligence: Theories, Models, and Applications Abnormal Event Detection in Video Surveillance Event-Driven Surveillance Event-Driven Surveillance Social Networking and Computational Intelligence Two-phased Surveillance Aware Scheduling Mechanism for Event Detection and Packet Delivery in Wireless Sensor Networks Evaluation of Smart Video for Transit Event Detection Object Tracking, Shadow Removal and Collision Event Detection for Traffic Surveillance System A Life Event Detection System Using Real-time Heterogeneous Context Monitoring and Formal Concept Analysis Computational Modelling of Objects Represented in Images III Video Event Detection Framework on Large-scale Video Data Infectious Disease Informatics and Biosurveillance Emerging Digital Forensics Applications for Crime Detection, Prevention, and Security Optimizing Biosurveillance Systems that Use Threshold-based Event Detection Methods Video Surveillance A Generalized Theory of Surveillance Cooperative Hybrid Tracking for Event Monitoring Systems Introduction to Intelligent Surveillance Semantic Hyper/Multimedia Adaptation Advances in Visual Computing A Dynamically Configurable Log-based Distributed Security Event Detection Methodology Using Simple Event Correlator Advances in Artificial Intelligence: Theories, Models, and Applications Security Strategy Multi-Camera Networks 14th International Machine Vision and Image Processing Conference Semantic Computing Effective Surveillance for Homeland Security Information

Systems Design and Intelligent Applications Event Modelling, Detection and Mining in Multimedia Surveillance Videos Advanced Machine Learning Technologies and Applications Artificial Intelligence and Computational Intelligence Computer Vision: Concepts, Methodologies, Tools, and Applications Graphical Models for Security Developments in Animal Health Surveillance

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This volume constitutes the refereed proceedings of the 6th Hellenic Conference on Artificial Intelligence, SETN 2010, held in Athens, Greece, in May 2010. The 28 revised full papers and 22 revised short papers presented

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were carefully reviewed and selected from 83 submissions. The topics include but are not restricted to adaptive systems; AI and creativity; AI architectures; artificial life; autonomous systems; data mining and knowledge discovery; hybrid intelligent systems & methods; intelligent agents, multi-agent systems; intelligent distributed systems; intelligent information retrieval; intelligent/natural interactivity, intelligent virtual environments; knowledge representation and reasoning, logic programming; knowledge-based systems; machine learning, neural nets, genetic algorithms; natural language processing; planning and scheduling; problem solving, constraint satisfaction; robotics, machine vision, machine sensing. The two volume set LNCS 5875 and LNCS 5876 constitutes the refereed proceedings of the 5th International Symposium on Visual Computing, ISVC 2009, held in Las Vegas, NV, USA, in November/December 2009. The 97 revised full papers and 63 poster papers presented together with 40 full and 15 poster papers of 7 special tracks were carefully reviewed and selected from more than 320 submissions. The papers are organized in topical sections on computer graphics; visualization; feature extraction and matching; medical imaging; motion; virtual reality; face processing; reconstruction; detection and tracking; applications; and video analysis and event recognition. The 7 additional special tracks address issues such as object recognition; visual computing for robotics; computational bioimaging; 3D mapping, modeling and surface reconstruction; deformable models: theory and applications; visualization enhanced data analysis for health applications; and optimization for vision, graphics and medical imaging: theory and applications. This three-volume proceedings contains revised selected papers from the Second International Conference on Artificial Intelligence and Computational Intelligence, AICI 2011, held in Taiyuan, China, in September 2011. The total of 265 high-quality papers presented were carefully reviewed and selected from 1073 submissions. The topics of Part II covered are: heuristic searching methods; immune computation; information security; information theory; intelligent control; intelligent image processing; intelligent

information fusion; intelligent information retrieval; intelligent signal processing; knowledge representation; and machine learning. This book presents a selection of revised and extended versions of the best papers from the First International Conference on Social Networking and Computational Intelligence (SCI-2018), held in Bhopal, India, from October 5 to 6, 2018. It discusses recent advances in scientific developments and applications in these areas. The real-time detection of personal life events has great potential to provide human-friendly services. Using detected life events in the fields of health care, smart homes, elderly surveillance, and smart car, etc. will provide more relational information and/or services to a user. However, automatically detecting a life event from human behaviors and their surrounding contexts is a challenging problem. I believe that the combination of Formal Concept Analysis (FCA) and a context-aware mobile computing system can help a path toward automated life event detection. The advancement of the smartphone and its embedded sensors will enable this scenario. I propose a generic context-aware system based on Formal Concept Analysis, which covers both front-end and back-end processing, to detect human life events. The main contributions of this system are: 1) it provides a framework for real-time personal monitoring; 2) it integrates, processes and stores personalized latent features; and 3) it combines heterogeneous data streams into one life event. The experimental validation, which I implemented on an Android platform and server, demonstrates that a general life event model can be applied to each individual and that concept data analysis can be substituted for statistical data analyses in life event detection. I believe that my findings can lead to new event detection approach, which is not just confined to specific environments, such as Social Life Networking, video streams, or artificially organized sentient locations, but can be opened for all environments in the real world by using sensors and context factors. We developed a robust event detection and retrieval system for surveillance video. The proposed system offers vision-based capabilities for the detection and tracking of various objects of interest, and can

recognize events such as: 1. a person with certain attributes being present in the scene; 2. two people meeting; 3. people carrying bags; 4. bags being dropped; 5. bags being stolen; 6. bags being exchanged; 7. two people handshaking; 8. one person's pointing gesture. We use an improved adaptive Gaussian mixture model for background modeling and foreground detection; a connected component labeling algorithm is then employed to label the foreground pixels. A Kalman filter approach is used to build models for the entities of interest (people and bags), which is combined with color histograms for tracking. We use shape symmetry analysis and color histograms to detect people carrying bags. Our experiments demonstrate the ability to search for instances of events according to specific attributes in large video sequences. Nowadays, more and more users are witnessing the impact of Hypermedia/Multimedia as well as the penetration of social applications in their life. Parallel to the evolution of the Internet and Web, several Hypermedia/Multimedia schemes and technologies bring semantic-based intelligent, personalized and adaptive services to the end users. More and more techniques are applied in media systems in order to be user/group-centric, adapting to different content and context features of a single or a community user. In respect to all the above, researchers need to explore and study the plethora of challenges that emergent personalisation and adaptation technologies bring to the new era. This edited volume aims to increase the awareness of researchers in this area. All contributions provide an in-depth investigation on research and deployment issues, regarding already introduced schemes and applications in Semantic Hyper/Multimedia and Social Media Adaptation. Moreover, the authors provide survey-based articles, so as potential readers can use it for catching up the recent trends and applications in respect to the relevant literature. Finally, the authors discuss and present their approach in the respective field or problem addressed. Effective Surveillance for Homeland Security: Balancing Technology and Social Issues provides a comprehensive survey of state-of-the-art methods and tools for the surveillance and protection of citizens and critical

infrastructures against natural and deliberate threats. Focusing on current technological challenges involving multi-disciplinary prob

Evaluation of smart video for transit event detection. This volume constitutes the refereed proceedings of the 6th Hellenic Conference on Artificial Intelligence, SETN 2010, held in Athens, Greece, in May 2010. The 28 revised full papers and 22 revised short papers presented were carefully reviewed and selected from 83 submissions. The topics include but are not restricted to adaptive systems; AI and creativity; AI architectures; artificial life; autonomous systems; data mining and knowledge discovery; hybrid intelligent systems & methods; intelligent agents, multi-agent systems; intelligent distributed systems; intelligent information retrieval; intelligent/natural interactivity, intelligent virtual environments; knowledge representation and reasoning, logic programming; knowledge-based systems; machine learning, neural nets, genetic algorithms; natural language processing; planning and scheduling; problem solving, constraint satisfaction; robotics, machine vision, machine sensing. The revolutionary way in which modern technologies have enabled us to exchange information with ease has led to the emergence of interdisciplinary research in digital forensics and investigations, which aims to combat the abuses of computer technologies. Emerging Digital Forensics Applications for Crime Detection, Prevention, and Security presents various digital crime and forensic disciplines that use electronic devices and software for crime prevention and detection. This book provides theoretical and empirical research articles and case studies for a broad range of academic readers as well as professionals, industry consultants, and practitioners involved in the use, design, and development of techniques related to digital forensics and investigation. Detection of events and actions in video entails substantial processing of very large, even open-ended, video streams. Video data presents a unique challenge for the information retrieval community because properly representing video events is challenging. We propose a novel approach to analyze temporal aspects of video data. We consider video data as a sequence of images that

form a 3-dimensional spatiotemporal structure, and perform multiview orthographic projection to transform the video data into 2-dimensional representations. The projected views allow a unique way to represent video events and capture the temporal aspect of video data. We extract local salient points from 2D projection views and perform detection-via-similarity approach on a wide range of events against real-world surveillance data. We demonstrate our example-based detection framework is competitive and robust. We also investigate the synthetic example driven retrieval as a basis for query-by-example. The Web has become a rich source of personal information in the last few years. People twitter, blog, and chat online. Current feelings, experiences or latest news are posted. For instance, first hints to disease outbreaks, customer preferences, or political changes could be identified with this data. Surveillance or early warning systems enable such detection of changes and support humans in getting information on changing situations. However, the variety of data that could be considered for surveillance is immense, ranging from sensor-measured values to collected counts and information extracted from natural language documents. Denecke's objective is to introduce the multiple possibilities and facets of surveillance and its applications. She first introduces the task of surveillance and provides an overview on surveillance in various domains. Next, the various information sources that are available and could already be used by surveillance systems are summarized. In the main part of the book, her focus is on unstructured data as a source for surveillance. An overview on existing methods as well as methods to be developed in order to process this kind of data with respect to surveillance is presented. As an example application, she introduces disease surveillance using Web 2.0, including corresponding methods and challenges to be addressed. The book closes with remarks on new possibilities for surveillance gained by recent developments of the Internet and mobile communication, and with an outline of future challenges. We describe a methodology for optimizing a threshold detection-based biosurveillance system. The goal is to maximize the system-wide probability of detecting an

"event of interest" against a noisy background, subject to a constraint on the expected number of false signals. We use non-linear programming to appropriately set detection thresholds taking into account the probability of an event of interest occurring somewhere in the coverage area. Using this approach, public health officials can "tune" their biosurveillance systems to optimally detect various threats, thereby allowing practitioners to focus their public health surveillance activities. Given some distributional assumptions, we derive a 1-dimensional optimization methodology that allows for the efficient optimization of very large systems. We demonstrate that optimizing a syndromic surveillance system can improve its performance by 20-40 percent. The fields of computer vision and image processing are constantly evolving as new research and applications in these areas emerge. Staying abreast of the most up-to-date developments in this field is necessary in order to promote further research and apply these developments in real-world settings. Computer Vision: Concepts, Methodologies, Tools, and Applications is an innovative reference source for the latest academic material on development of computers for gaining understanding about videos and digital images. Highlighting a range of topics, such as computational models, machine learning, and image processing, this multi-volume book is ideally designed for academicians, technology professionals, students, and researchers interested in uncovering the latest innovations in the field. As the first volume of World Scientific Encyclopedia with Semantic Computing and Robotic Intelligence, this volume is designed to lay the foundation for the understanding of the Semantic Computing (SC), as a core concept to study Robotic Intelligence in the subsequent volumes. This volume aims to provide a reference to the development of Semantic Computing, in the terms of "meaning", "context", and "intention". It brings together a series of technical notes, in average, no longer than 10 pages in length, each focuses on one topic in Semantic Computing; being review article or research paper, to explain the fundamental concepts, models or algorithms, and possible applications of the technology concerned. This

volume will address three core areas in Semantic Computing: Understanding the (possibly naturally-expressed) intentions (semantics) of users and expressing them in a machine-processable format: Semantics description languages, ontology integration, interoperability Understanding the meanings (semantics) of computational content (of various sorts, including, but is not limited to, text, video, audio, process, network, software and hardware) and expressing them in a machine-processable format in Multimedia, IoT, SDN, wearable computing, interfactable with mobile computing, search engines, question answering, web services, to support applications in biomedicine, healthcare, manufacturing, engineering, education, finance, entertainment, business, science and humanity Mapping the semantics of the user in context for content retrieval, management, creation in the form of structured data, image and video, audio and speech, big data, natural language, deep learning. The Web has become a rich source of personal information in the last few years. People twitter, blog, and chat online. Current feelings, experiences or latest news are posted. For instance, first hints to disease outbreaks, customer preferences, or political changes could be identified with this data. Surveillance or early warning systems enable such detection of changes and support humans in getting information on changing situations. However, the variety of data that could be considered for surveillance is immense, ranging from sensor-measured values to collected counts and information extracted from natural language documents. Denecke's objective is to introduce the multiple possibilities and facets of surveillance and its applications. She first introduces the task of surveillance and provides an overview on surveillance in various domains. Next, the various information sources that are available and could already be used by surveillance systems are summarized. In the main part of the book, her focus is on unstructured data as a source for surveillance. An overview on existing methods as well as methods to be developed in order to process this kind of data with respect to surveillance is presented. As an example application, she introduces disease surveillance using Web 2.0,

including corresponding methods and challenges to be addressed. The book closes with remarks on new possibilities for surveillance gained by recent developments of the Internet and mobile communication, and with an outline of future challenges. Established in 1997, the International Machine Vision and Image Processing (IMVIP) conferences bring together theoreticians, practitioners, industrialists and academics, from the numerous related disciplines involved in the processing and analysis of image-based information. These events provide a platform for communication and exchange between participants whereby cutting edge research and advances within the field can be communicated, discussed and information exchanged. IMVIP events are hosted annually by different universities on the island of Ireland. These proceedings reflect the manuscripts selected for oral presentation at the 14th instalment of the series hosted by the University of Limerick, Ireland in 2010 in association with the Irish Pattern Recognition and Classification Society (IPRCS), a member organisation of the International Association of Pattern Recognition (IAPR). This book constitutes revised papers from the 6th International Workshop on Graphical Models for Security, GraMSec 2019, held in Hoboken, NJ, USA, in June 2019. The 8 full papers presented in this volume were carefully reviewed and selected from 15 submissions. The book also contains two invited talks. The contributions deal with the latest research and developments on graphical models for security. The censorship and surveillance of individuals, societies, and countries have been a long-debated ethical and moral issue. In consequence, it is vital to explore this controversial topic from all angles. *Censorship, Surveillance, and Privacy: Concepts, Methodologies, Tools, and Applications* is a vital reference source on the social, moral, religious, and political aspects of censorship and surveillance. It also explores the techniques of technologically supported censorship and surveillance. Highlighting a range of topics such as political censorship, propaganda, and information privacy, this multi-volume book is geared towards government officials, leaders, professionals, policymakers, media specialists, academicians, and researchers interested in the

various facets of censorship and surveillance. This book presents the latest achievements and developments in the field of video surveillance. The chapters selected for this book comprise a cross-section of topics that reflect a variety of perspectives and disciplinary backgrounds. Besides the introduction of new achievements in video surveillance, this book also presents some good overviews of the state-of-the-art technologies as well as some interesting advanced topics related to video surveillance. Summing up the wide range of issues presented in the book, it can be addressed to a quite broad audience, including both academic researchers and practitioners in halls of industries interested in scheduling theory and its applications. I believe this book can provide a clear picture of the current research status in the area of video surveillance and can also encourage the development of new achievements in this field. *Computational Modelling of Objects Represented in Images: Fundamentals, Methods and Applications III* contains all contributions presented at the International Symposium CompIMAGE 2012 - Computational Modelling of Object Presented in Images: Fundamentals, Methods and Applications (Rome, Italy, 5-7 September 2012). The contributions cover the state-of-the-art. This accessible textbook/reference reviews the fundamental concepts and practical issues involved in designing digital surveillance systems that fully exploit the power of intelligent computing techniques. The book presents comprehensive coverage of all aspects of such systems, from camera calibration and data capture, to the secure transmission of surveillance data. In addition to the detection and recognition of objects and biometric features, the text also examines the automated observation of surveillance events, and how this can be enhanced through the use of deep learning methods and supercomputing technology. This updated new edition features extended coverage on face detection, pedestrian detection and privacy preservation for intelligent surveillance. *Topics and features:* contains review questions and exercises in every chapter, together with a glossary; describes the essentials of implementing an intelligent surveillance system and analyzing surveillance data, including a range of biometric

characteristics; examines the importance of network security and digital forensics in the communication of surveillance data, as well as issues of privacy and ethics; discusses the Viola-Jones object detection method, and the HOG algorithm for pedestrian and human behavior recognition; reviews the use of artificial intelligence for automated monitoring of surveillance events, and decision-making approaches to determine the need for human intervention; presents a case study on a system that triggers an alarm when a vehicle fails to stop at a red light, and identifies the vehicle's license plate number; investigates the use of cutting-edge supercomputing technologies for digital surveillance, such as FPGA, GPU and parallel computing. This concise, classroom-tested textbook is ideal for undergraduate and postgraduate-level courses on intelligent surveillance. Researchers interested in entering this area will also find the book suitable as a helpful self-study reference. Addressing the diminished understanding of the value of security on the executive side and a lack of good business processes on the security side, *Security Strategy: From Requirements to Reality* explains how to select, develop, and deploy the security strategy best suited to your organization. It clarifies the purpose and place of strategy in an information security program and arms security managers and practitioners with a set of security tactics to support the implementation of strategic planning initiatives, goals, and objectives. The book focuses on security strategy planning and execution to provide a clear and comprehensive look at the structures and tools needed to build a security program that enables and enhances business processes. Divided into two parts, the first part considers business strategy and the second part details specific tactics. The information in both sections will help security practitioners and managers develop a viable synergy that will allow security to take its place as a valued partner and contributor to the success and profitability of the enterprise. Confusing strategies and tactics all too often keep organizations from properly implementing an effective information protection strategy. This versatile reference presents information in a way that makes it accessible and applicable to organizations of all sizes. Complete with

checklists of the physical security requirements that organizations should consider when evaluating or designing facilities, it provides the tools and understanding to enable your company to achieve the operational efficiencies, cost reductions, and brand enhancements that are possible when an effective security strategy is put into action. The first book, by the leading experts, on this rapidly developing field with applications to security, smart homes, multimedia, and environmental monitoring Comprehensive coverage of fundamentals, algorithms, design methodologies, system implementation issues, architectures, and applications Presents in detail the latest developments in multi-camera calibration, active and heterogeneous camera networks, multi-camera object and event detection, tracking, coding, smart camera architecture and middleware This book is the definitive reference in multi-camera networks. It gives clear guidance on the conceptual and implementation issues involved in the design and operation of multi-camera networks, as well as presenting the state-of-the-art in hardware, algorithms and system development. The book is broad in scope, covering smart camera architectures, embedded processing, sensor fusion and middleware, calibration and topology, network-based detection and tracking, and applications in distributed and collaborative methods in camera networks. This book will be an ideal reference for university researchers, R&D engineers, computer engineers, and graduate students working in signal and video processing, computer vision, and sensor networks. Hamid Aghajan is a Professor of Electrical Engineering (consulting) at Stanford University. His research is on multi-camera networks for smart environments with application to smart homes, assisted living and well being, meeting rooms, and avatar-based communication and social interactions. He is Editor-in-Chief of *Journal of Ambient Intelligence and Smart Environments*, and was general chair of ACM/IEEE ICDCS 2008. Andrea Cavallaro is Reader (Associate Professor) at Queen Mary, University of London (QMUL). His research is on target tracking and audiovisual content analysis for advanced surveillance and multi-sensor systems. He serves as Associate Editor of the *IEEE Signal*

Processing Magazine and the IEEE Trans. on Multimedia, and has been general chair of IEEE AVSS 2007, ACM/IEEE ICDCS 2009 and BMVC 2009. The first book, by the leading experts, on this rapidly developing field with applications to security, smart homes, multimedia, and environmental monitoring Comprehensive coverage of fundamentals, algorithms, design methodologies, system implementation issues, architectures, and applications Presents in detail the latest developments in multi-camera calibration, active and heterogeneous camera networks, multi-camera object and event detection, tracking, coding, smart camera architecture and middleware This book constitutes the refereed proceedings of the First International Conference on Advanced Machine Learning Technologies and Applications, AMLTA 2012, held in Cairo, Egypt, in December 2012. The 58 full papers presented were carefully reviewed and selected from 99 initial submissions. The papers are organized in topical sections on rough sets and applications, machine learning in pattern recognition and image processing, machine learning in multimedia computing, bioinformatics and cheminformatics, data classification and clustering, cloud computing and recommender systems. Content-based video analysis serves as the cornerstone for many applications: video understanding or summarization, multimedia information retrieval and data mining, etc. In our research, we aim to automatically detect anomalous events from surveillance videos (such as video monitoring traffic flow or pedestrian congestion in public spaces). Conceptually, what constitutes an anomaly varies in different video scenarios and is difficult to be defined in a general case. Our first solution is based on unsupervised clustering of object trajectories and anomalous trajectory identification in a probabilistic framework. Then we extend this solution to an arbitrary time length (any part of a complete trajectory) and multiple objects (multiple trajectories). Furthermore, we solve problems specifically in video scenarios where object trajectories cannot be extracted (e.g., crowd motion analysis). Our contributions include a novel hierarchical clustering algorithm and categorization of anomalous video events by spatiotemporal context. This book on Infectious Disease

Informatics (IDI) and biosurveillance is intended to provide an integrated view of the current state of the art, identify technical and policy challenges and opportunities, and promote cross-disciplinary research that takes advantage of novel methodology and what we have learned from innovative applications. This book also fills a systemic gap in the literature by emphasizing informatics driven perspectives (e.g., information system design, data standards, computational aspects of biosurveillance algorithms, and system evaluation). Finally, this book attempts to reach policy makers and practitioners through the clear and effective communication of recent research findings in the context of case studies in IDI and biosurveillance, providing “hands-on” in-depth opportunities to practitioners to increase their understanding of value, applicability, and limitations of technical solutions. This book collects the state of the art research and modern perspectives of distinguished individuals and research groups on cutting-edge IDI technical and policy research and its application in biosurveillance. The contributed chapters are grouped into three units. Unit I provides an overview of recent biosurveillance research while highlighting the relevant legal and policy structures in the context of IDI and biosurveillance ongoing activities. It also identifies IDI data sources while addressing information collection, sharing, and dissemination issues as well as ethical considerations. Unit II contains survey chapters on the types of surveillance methods used to analyze IDI data in the context of public health and bioterrorism. Specific computational techniques covered include: text mining, time series analysis, multiple data streams methods, ensembles of surveillance methods, spatial analysis and visualization, social network analysis, and agent-based simulation. Unit III examines IT and decision support for public health event response and bio-defense. Practical lessons learned in developing public health and biosurveillance systems, technology adoption, and syndromic surveillance for large events are discussed. The goal of this book is to provide an understandable interdisciplinary IDI and biosurveillance reference either used as a standalone textbook or reference for students,

researchers, and practitioners in public health, veterinary medicine, biostatistics, information systems, computer science, and public administration and policy. In this thesis, a novel hybrid visual tracking system for event detection and human tracking is proposed. This surveillance system is composed of a stationary camera and a pan tilt zoom (PTZ) camera. The two cameras are geometrically related using camera calibration from images of spheres. By performing a novel sensitivity analysis of the calibration method, guidelines to obtain better calibration results are established. The stationary camera detects events of fall and wandering using motion-based visual tracking. The PTZ camera then tracks and follows the person who triggered an event using color-based particle filtering and PTZ strategies defined in this thesis. The purpose of tracking in view of the PTZ camera is to continuously keep the

person in the camera view and to obtain identifying details of the person. Experimental results for camera calibration, event detection, and human tracking are presented to demonstrate the proposed cooperative hybrid visual tracking system. The book gathers a collection of high-quality peer-reviewed research papers presented at the International Conference on Information System Design and Intelligent Applications (INDIA 2018), which was held at the Universite des Mascareignes, Mauritius from July 19 to 21, 2018. It covers a wide range of topics in computer science and information technology, from image processing, database applications and data mining, to grid and cloud computing, bioinformatics and many more. The intelligent tools discussed, e.g. swarm intelligence, artificial intelligence, evolutionary algorithms, and bio-inspired algorithms, are currently being applied to solve challenging problems in various domains.