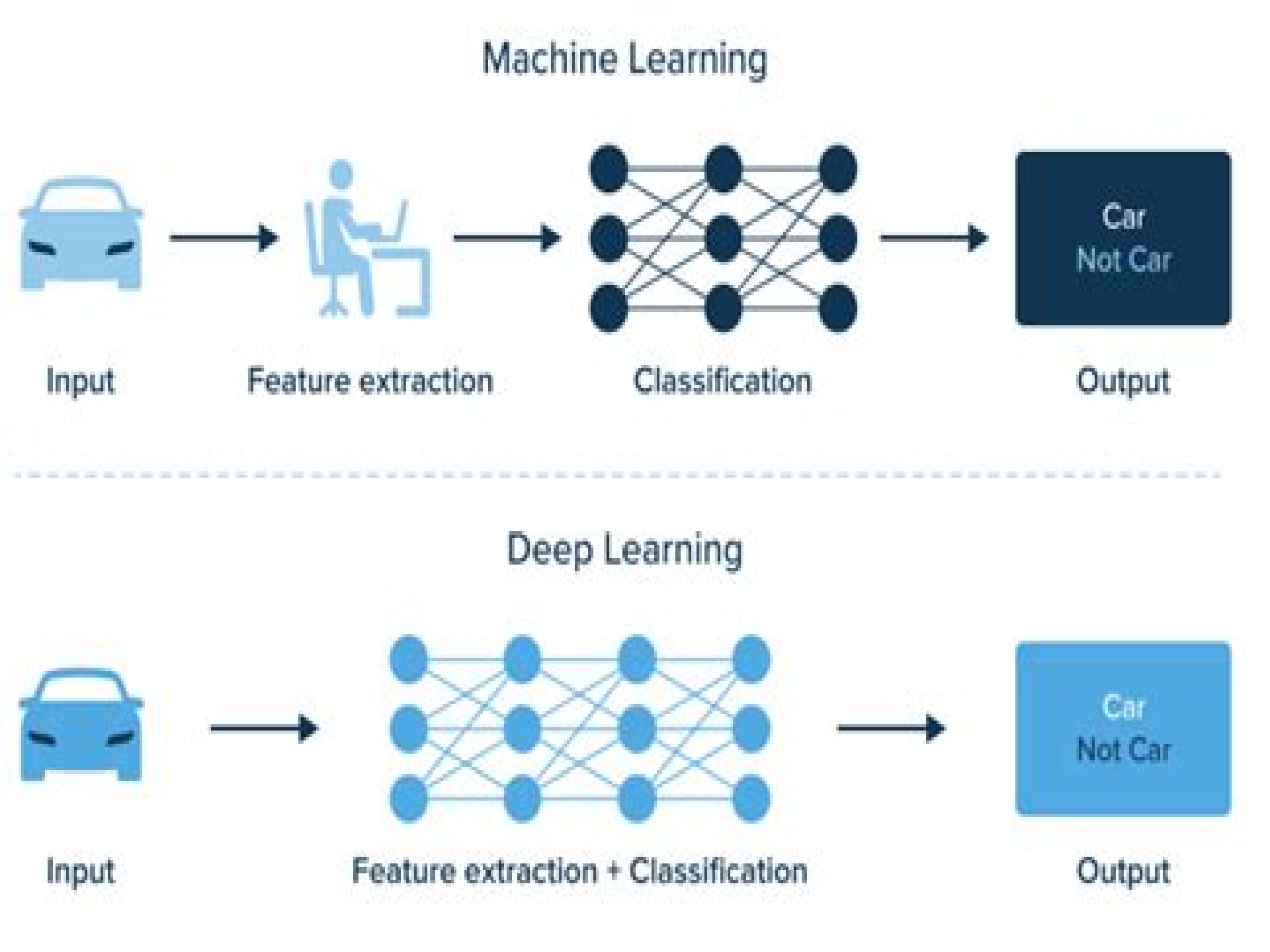
Machine Learning
Car
Not Car
Input
Feature extraction
Classification
Output
Deep Learning
Car
Not Car
Input
Feature extraction + Classification
Output

Chapter 4 Deep Learning Techniques For Roadside Video Data

Ian Pickup

Chapter 4 Deep Learning Techniques For Roadside Video Data:

Roadside Video Data Analysis Brijesh Verma,Ligang Zhang,David Stockwell,2017-04-28 This book highlights the methods and applications for roadside video data analysis with a particular focus on the use of deep learning to solve roadside video data segmentation and classification problems It describes system architectures and methodologies that are specifically built upon learning concepts for roadside video data processing and offers a detailed analysis of the segmentation feature extraction and classification processes Lastly it demonstrates the applications of roadside video data analysis including scene labelling roadside vegetation classification and vegetation biomass estimation in fire risk assessment

Intelligent Multi-Modal Data Processing Soham Sarkar,Abhishek Basu,Siddhartha Bhattacharyya,2021-04-08 A comprehensive review of the most recent applications of intelligent multi modal data processing Intelligent Multi Modal Data Processing contains a review of the most recent applications of data processing The Editors and contributors noted experts on the topic offer a review of the new and challenging areas of multimedia data processing as well as state of the art algorithms to solve the problems in an intelligent manner The text provides a clear understanding of the real life implementation of different statistical theories and explains how to implement various statistical theories Intelligent Multi Modal Data Processing is an authoritative guide for developing innovative research ideas for interdisciplinary research practices Designed as a practical resource the book contains tables to compare statistical analysis results of a novel technique to that of the state of the art techniques and illustrations in the form of algorithms to establish a pre processing and or post processing technique for model building The book also contains images that show the efficiency of the algorithm on standard data set This important book Includes an in depth analysis of the state of the art applications of signal and data processing Contains contributions from noted experts in the field Offers information on hybrid differential evolution for optimal multilevel image thresholding Presents a fuzzy decision based multi objective evolutionary method for video summarisation Written for students of technology and management computer scientists and professionals in information technology Intelligent Multi Modal Data Processing brings together in one volume the range of multi modal data processing

Advances in Image Processing, Reliability, and Artificial Intelligence Mario J. Divan,Prashant Johri,Francesc Guim,Dmitry Shchemelinin,Marcos Carranza,2025-12-02 Advances in Image Processing Reliability and Artificial Intelligence Data Centred Techniques and Applications in Edge Computing provides a clear outlook of the mechanisms risks challenges and opportunities in system reliability for image processing and AI applications running on edge devices It provides Best Known Configuration BKC and Methods BKM while discussing trends and future works based on current research The content serves as a reference for practitioners and provides a state of the art for researchers in the area It provides foundations to analyse and replicate different applications through use cases It tackles concerns for how reliability aspects i e fault tolerance availability maturity and recoverability are addressed for applications running in an environment that is not

fully controlled and exposed to environmental variations Provides an analysis of current challenges and trends in systems reliability AI and image processing in edge computing for supporting different data driven decision making strategies Considers the challenges and opportunities regarding data sovereignty sustainability model lifecycle and AI ethics in edge computing Explains strategies and trends for monitoring and meta monitoring AI deployments and system reliability in edge computing Addresses the top concerns in the reliability AI and image processing in edge computing for supporting distributed decision making Describes an industry perspective for different verticals outlining trends and future research directions IoT Based Smart Applications Nidhi Sindhwani,Rohit Anand,M Niranjanamurthy,Dinesh Chander Verma,Emilia Balas Valentina,2022-09-30 This book provides insights into IoT its applications and various implementation techniques The authors first discuss the IoT design methodology to define the domain model They then cover various connection methodologies used in IoT such as Ethernet Wi Fi low powered wide area network LPWAN Bluetooth RFID cellular and satellite and more along with their challenges An example is made on the designing process using Arduino which offers smart connected and secure elements they also illustrate the integration of IoT with Blockchain cloud machine learning big data embedded software sensors etc The book going on to cover the future of IoT in various sectors and how IoT will continue to be game changing technology **Popular Mechanics** ,2000-01 Popular Mechanics inspires instructs and influences readers to help them master the modern world Whether it s practical DIY home improvement tips gadgets and digital technology information on the newest cars or the latest breakthroughs in science PM is the ultimate guide to our high tech lifestyle *Applications of Deep Learning and Computer Vision in Large Scale Quantification of Tree Canopy Cover and Real-time Estimation of Street Parking* Bill Yang Cai,2018 A modern city generates a large volume of digital information especially in the form of unstructured image and video data Recent advancements in deep learning techniques have enabled effective learning and estimation of high level attributes and meaningful features from large digital datasets of images and videos In my thesis I explore the potential of applying deep learning to image and video data to quantify urban tree cover and street parking utilization Large scale and accurate quantification of urban tree cover is important towards informing government agencies in their public greenery efforts and useful for modelling and analyzing city ecology and urban heat island effects We apply state of the art deep learning models and compare their performance to a previously established benchmark of an unsupervised method Our training procedure for deep learning models is novel we utilize the abundance of openly available and similarly labelled street level image datasets to pre train our model We then perform additional training on a small training dataset consisting of GSV images We also employ a recently developed method called gradient weighted class activation map Grad CAM to interpret the features learned by the end to end model The results demonstrate that deep learning models are highly accurate can be interpretable and can also be efficient in terms of data labelling effort and computational resources Accurate parking quantification would inform developers and municipalities in space allocation and

design while real time measurements would provide drivers and parking enforcement with information that saves time and resources We propose an accurate and real time video system for future Internet of Things IoT and smart cities applications Using recent developments in deep convolutional neural networks DCNNs and a novel intelligent vehicle tracking filter the proposed system combines information across multiple image frames in a video sequence to remove noise introduced by occlusions and detection failures We demonstrate that the proposed system achieves higher accuracy than pure image based instance segmentation and is comparable in performance to industry benchmark systems that utilize more expensive sensors such as radar Furthermore the proposed system can be easily configured for deployment in different parking scenarios and can provide spatial information beyond traditional binary occupancy statistics Deep Learning for Video Understanding Zuxuan Wu,Yu-Gang Jiang,2024-08-01 This book presents deep learning techniques for video understanding For deep learning basics the authors cover machine learning pipelines and notations 2D and 3D Convolutional Neural Networks for spatial and temporal feature learning For action recognition the authors introduce classical frameworks for image classification and then elaborate both image based and clip based 2D 3D CNN networks for action recognition For action detection the authors elaborate sliding windows proposal based detection methods single stage and two stage approaches spatial and temporal action localization followed by datasets introduction For video captioning the authors present language based models and how to perform sequence to sequence learning for video captioning For unsupervised feature learning the authors discuss the necessity of shifting from supervised learning to unsupervised learning and then introduce how to design better surrogate training tasks to learn video representations Finally the book introduces recent self training pipelines like contrastive learning and masked image video modeling with transformers The book provides promising directions with an aim to promote future research outcomes in the field of video understanding with deep learning *Deep Learning and Its Applications for Vehicle Networks* Fei Hu,Iftikhar Rasheed,2023-05-12 Deep Learning DL is an effective approach for AI based vehicular networks and can deliver a powerful set of tools for such vehicular network dynamics In various domains of vehicular networks DL can be used for learning based channel estimation traffic flow prediction vehicle trajectory prediction location prediction based scheduling and routing intelligent network congestion control mechanism smart load balancing and vertical handoff control intelligent network security strategies virtual smart and efficient resource allocation and intelligent distributed resource allocation methods This book is based on the work from world famous experts on the application of DL for vehicle networks It consists of the following five parts I DL for vehicle safety and security This part covers the use of DL algorithms for vehicle safety or security II DL for effective vehicle communications Vehicle networks consist of vehicle to vehicle and vehicle to roadside communications This part covers how Intelligent vehicle networks require a flexible selection of the best path across all vehicles adaptive sending rate control based on bandwidth availability and timely data downloads from a roadside base station III DL for vehicle control The myriad operations that require intelligent control for each

individual vehicle are discussed in this part This also includes emission control which is based on the road traffic situation the charging pile load is predicted through DL andvehicle speed adjustments based on the camera captured image analysis IV DL for information management This part covers some intelligent information collection and understanding We can use DL for energy saving vehicle trajectory control based on the road traffic situation and given destination information we can also natural language processing based on DL algorithm for automatic internet of things IoT search during driving V Other applications This part introduces the use of DL models for other vehicle controls Autonomous vehicles are becoming more and more popular in society The DL and its variants will play greater roles in cognitive vehicle communications and control Other machine learning models such as deep reinforcement learning will also facilitate intelligent vehicle behavior understanding and adjustment This book will become a valuable reference to your understanding of this critical field

Structured Deep Learning for Video Analysis Fabien Baradel,2020 With the massive increase of video content on Internet and beyond the automatic understanding of visual content could impact many different application fields such as robotics health care content search or filtering The goal of this thesis is to provide methodological contributions in Computer Vision and Machine Learning for automatic content understanding from videos We emphasis on problems namely fine grained human action recognition and visual reasoning from object level interactions In the first part of this manuscript we tackle the problem of fine grained human action recognition We introduce two different trained attention mechanisms on the visual content from articulated human pose The first method is able to automatically draw attention to important pre selected points of the video conditioned on learned features extracted from the articulated human pose We show that such mechanism improves performance on the final task and provides a good way to visualize the most discriminative parts of the visual content The second method goes beyond pose based human action recognition We develop a method able to automatically identify unstructured feature clouds of interest in the video using contextual information Furthermore we introduce a learned distributed system for aggregating the features in a recurrent manner and taking decisions in a distributed way We demonstrate that we can achieve a better performance than obtained previously without using articulated pose information at test time In the second part of this thesis we investigate video representations from an object level perspective Given a set of detected persons and objects in the scene we develop a method which learns to infer the important object interactions through space and time using the video level annotation only That allows to identify important objects and object interactions for a given action as well as potential dataset bias Finally in a third part we go beyond the task of classification and supervised learning from visual content by tackling causality in interactions in particular the problem of counterfactual learning We introduce a new benchmark namely CoPhy where after watching a video the task is to predict the outcome after modifying the initial stage of the video We develop a method based on object level interactions able to infer object properties without supervision as well as future object locations after the intervention **Machine and Deep Learning Techniques**

for Real-time In-vehicle Fog Detection and Speed Behavior Investigation Utilizing the SHRP2 Naturalistic Driving Study Data Md Nasim Khan,2018 The negative impact of reduced visibility on driver performance has been recognized as one of the major causes of motor vehicle crashes Proper assessment of real time visibility condition is therefore crucial for safe driving especially during adverse weather including fog Although many studies have investigated various visibility detection methods most of them had several limitations and did not provide reliable real time prediction capabilities This study describes some unique and advanced data mining techniques for detecting real time fog and visibility conditions utilizing video data from the Second Strategic Highway Research Program SHRP2 Naturalistic Driving Study NDS dataset In this study Gray Level Co occurrence Matrix GLCM features were extracted and significant texture features including Contrast Correlation Energy and Homogeneity were selected as classification parameters for Support Vector Machine SVM and K Nearest Neighbors K NN classifiers In addition Convolutional Neural Network CNN Deep Learning technique was also examined for fog detection Although the analysis was done initially on a dataset consisted of binary weather conditions including clear and fog it has been successfully extended to include different levels of fog i e near fog and distant fog The classifications were conducted to leverage the SHRP2 NDS data by adding additional trajectory level weather and visibility variables to the original data in an automated fashion While the prediction accuracy of the first analysis was approximately 92% and 91% for the SVM and K NN classifier respectively the CNN Deep Learning technique produced a far better classification results with an accuracy close to 99% As expected the prediction accuracy of the second analysis with more refined weather categories was relatively less compared to the first analysis where the SVM and the K NN classifier produced an accuracy of about 89% and 88% respectively and the CNN provided an accuracy of about 97% The methods developed in this study are based on a single in vehicle camera and can be used to detect daytime fog in real time This thesis also utilized the data from the SHRP2 NDS database to understand driver behavior in general and speed selection in particular during clear and foggy weather conditions In this study a preliminary analysis and an ordered logit model were developed to evaluate driver speed behavior in fog and clear weather conditions The preliminary analysis showed a Weibull speed distribution in heavy fog under free flow conditions while the speeds were normally distributed in clear weather for the matching dataset i e same driver vehicle route and traffic state Descriptive analysis indicated about 10% reduction in speed during near fog and about 3% reduction in speed during distant fog The calibrated speed selection model found weather related factors including fog visibility and surface conditions to have a significant impact on driver speed selection For instance results showed that drivers were more likely to select significantly lower speeds during foggy weather conditions More specifically the odds of drivers reducing their speeds from the posted speed limit were 1 31 and 1 28 times higher for drivers traveling in near fog and distant fog respectively compared to drivers who were driving in clear weather conditions The results from this study will unlock new horizons and potentials in conducting adverse weather related research utilizing

the SHRP2 NDS data The advanced Machine and Deep Learning techniques introduced in this study could be extended to other weather and surface conditions Moreover the findings from this study can also be incorporated into Advanced Driving Assistance Systems ADAS and Connected Variable Speed Limit VSL algorithms to improve their reliability and accuracy

Deep Learning for Social Media Data Analytics Tzung-Pei Hong,Leticia Serrano-Estrada,Akrati Saxena,Anupam Biswas,2022-09-18 This edited book covers ongoing research in both theory and practical applications of using deep learning for social media data Social networking platforms are overwhelmed by different contents and their huge amounts of data have enormous potential to influence business politics security planning and other social aspects Recently deep learning techniques have had many successful applications in the AI field The research presented in this book emerges from the conviction that there is still much progress to be made toward exploiting deep learning in the context of social media data analytics It includes fifteen chapters organized into four sections that report on original research in network structure analysis social media text analysis user behaviour analysis and social media security analysis This work could serve as a good reference for researchers as well as a compilation of innovative ideas and solutions for practitioners interested in applying deep learning techniques to social media data analytics **Ultimate Deepfake Detection Using Python: Master Deep Learning Techniques like CNNs, GANs, and Transformers to Detect Deepfakes in Images, Audio, and Videos Using Python** Dr. Nimrita,2024-09-21 Deepfake Detection Unlocked Python Approaches for Deepfake Images Videos Audio Detection Key Features Comprehensive and graded approach to Deepfake detection using Python and its libraries Practical implementation of deepfake detection techniques using Python Hands on chapters for detecting deepfake images videos and audio Covers Case study for providing real world application of deepfake detection Book DescriptionIn today s digital world mastering deepfake detection is crucial with deepfake content increasing by 900% since 2019 and 96% used for malicious purposes like fraud and disinformation Ultimate Deepfake Detection with Python equips you with the skills to combat this threat using Python s AI libraries offering practical tools to protect digital security across images videos and audio This book explores generative AI and deepfakes giving readers a clear understanding of how these technologies work and the challenges of detecting them With practical Python code examples it provides the tools necessary for effective deepfake detection across media types like images videos and audio Each chapter covers vital topics from setting up Python environments to using key datasets and advanced deep learning techniques Perfect for researchers developers and cybersecurity professionals this book enhances technical skills and deepens awareness of the ethical issues around deepfakes Whether building new detection systems or improving current ones this book offers expert strategies to stay ahead in digital media security What you will learn Understand the fundamentals of generative AI and deepfake technology and the potential risks they pose Explore the various methods and techniques used to identify deepfakes as well as the obstacles faced in this field Learn to use essential datasets and label image video and audio data for building deepfake detection models Apply

advanced machine learning models like CNNs RNNs GANs and Transformers for deepfake detection Master active and passive methods for detecting face manipulation and build CNN based image detection systems Detect manipulations in videos develop a detection system and evaluate its performance using key metrics Build and implement a practical deepfake detection system to understand how these techniques are applied in real world scenarios Table of Contents1 Introduction to Generative AI and Deepfake Technology 2 Deepfake Detection Principles and Challenges 3 Ethical Considerations with the Use of Deepfakes 4 Setting Up your Machine for Deepfake Detection using Python 5 Deepfake Datasets 6 Techniques for Deepfake Detection 7 Detection of Deepfake Images 8 Detection of Deepfake Video 9 Detection of Deepfake Audio 10 Case Study in Deepfake Detection Index *Intelligent Image and Video Analytics* El-Sayed M. El-Alfy,George Bebis,Mengchu Zhou,2023-04-12 Video has rich information including meta data visual audio spatial and temporal data which can be analysed to extract a variety of low and high level features to build predictive computational models using machine learning algorithms to discover interesting patterns concepts relations and associations This book includes a review of essential topics and discussion of emerging methods and potential applications of video data mining and analytics It integrates areas like intelligent systems data mining and knowledge discovery big data analytics machine learning neural network and deep learning with focus on multimodality video analytics and recent advances in research applications Features Provides up to date coverage of the state of the art techniques in intelligent video analytics Explores important applications that require techniques from both artificial intelligence and computer vision Describes multimodality video analytics for different applications Examines issues related to multimodality data fusion and highlights research challenges Integrates various techniques from video processing data mining and machine learning which has many emerging indoors and outdoors applications of smart cameras in smart environments smart homes and smart cities This book aims at researchers professionals and graduate students in image processing video analytics computer science and engineering signal processing machine learning and electrical engineering Deep-Learning-based Video Analysis for Human Action Evaluation Chen Du,2022 As video analysis provides an automatic solution to extract meaningful information from the video content it can be applied in healthcare to evaluate human action patterns for various purposes such as biometrics estimation and performance assessment In recent years the fast development of deep learning and portable medical sensors has led to more affordable and accurate computer vision based measurements for human action patterns thus enabling a more efficient video analysis system for action evaluation in home and clinic environments We investigate the novel usage of video analysis for healthcare monitoring purposes including objective biometrics estimation and subjective action quality assessment We propose a deep learning framework to extract spatial temporal features and estimate biometrics or performance scores from 3D body landmarks using a graph convolutional neural network which offers a portable solution to obtain gold standard biometrics with 3D multi joint coordination underlying body movements and can provide real time feedback of movement performance

for rehabilitation exercises For biometrics estimation in Chapter 2 we propose two single task models for video level and frame level estimation respectively and a multi task learning approach to estimate CoP metrics on two different temporal levels in parallel To facilitate this line of research we collect and release a novel computer vision based 3D body landmark dataset using pose estimation We extend our framework to a traditional kinematics dataset collected by on body reflective markers by using adaptive graph convolution For action quality assessment we propose a deep learning framework for automatic assessment of physical rehabilitation exercises using a graph convolutional network with self supervised regularization in Chapter 3 To further improve the accessibility of the real time CoP metrics estimation system we investigate a view invariant video level CoP metrics estimation framework using a single RGB camera in Chapter 4 which could significantly benefit the data collection in home and clinic environments We also explore a semi supervised learning framework for video level CoP metrics estimation for partially labeled data with only a small portion of labels in Chapter 5 Our proposed methods potentially enable a more affordable comprehensive and portable virtual therapy system than is available with existing tools **Deep Learning Solutions for Video Encoding and Streaming** Somdyuti Paul,2022 Video data has emerged as the top contributor to the global internet traffic and video compression is the key technology that enables its efficient storage transmission and retrieval As the video compression technology advances to keep pace with the proliferation of video data state of the art video codecs that rely on block based hybrid coding tend to become increasingly complex and computationally intensive Moreover currently it appears challenging to significantly improve video compression efficiency by solely relying on traditional approaches Consequently deep learning techniques are being extensively explored in the context of designing video compression technologies My research addresses the problem of making the benefits of data driven deep learning accessible to some key areas of video coding and compression based video streaming technologies First this dissertation introduces the deep learning framework to speed up intra mode encoding in the VP9 video codec In VP9 the sizes of blocks are decided by a computationally intensive rate distortion optimization RDO process that evaluates the combinatorially complex search space of possible partitions of 64 64 superblocks We devised a learning based alternative framework to predict the intra mode superblock partitions using a hierarchical fully convolutional network H FCN that was experimentally shown to speed up the intra mode encoding of the reference VP9 encoder Subsequently our work on deep learning based block motion estimation is expounded Block based motion estimation is essential for performing inter prediction in hybrid codecs a mechanism which is responsible for bulk of the compression capability achieved by it However prevalent block matching based procedures that are used to compute block motion vectors MVs are computationally intensive are prone to detecting spurious motions which worsen at smaller block sizes and are agnostic to the perceptual quality of the predicted frames To address these issues we developed a composite block translation network CBT Net that jointly predicts the MVs of blocks having multiple sizes by using the MVs predicted for larger blocks to guide the motion

estimation of smaller blocks Our framework produces more coherent motion fields at smaller block sizes as compared to traditional block matching based MV estimation and is also computationally efficient Its rate distortion performance gains are demonstrated for AV1 encoding The last part of this dissertation focuses on learning based approaches in the context of designing compression based adaptive video streaming Adaptive video streaming relies on the construction of efficient bitrate ladders to deliver the best possible visual quality to viewers under bandwidth constraints The traditional method of content dependent bitrate ladder selection requires a video shot to be pre encoded with multiple encoding parameters to find the optimal operating points given by the convex hull of the resulting rate quality curves However this pre encoding step causes significant overhead in terms of both computation and time expenditure To reduce this overhead we employed a recurrent convolutional network RCN to implicitly analyze the spatiotemporal complexity of video shots in order to predict their convex hulls The proposed RCN Hull model substantially reduced the pre encoding time needed for convex hull generation while closely approximating the optimal convex hulls The competitive advantage of our method over existing ones based on heuristics or feature based machine learning was also demonstrated The different deep learning frameworks that we introduced in this dissertation thus attest to the compelling advantages offered by deep learning based tools and techniques in driving the development and deployment of future video coding and streaming technologies **Video Based Machine Learning for Traffic Intersections** Tania Banerjee,Xiaohui Huang,Aotian Wu,Ke Chen,Anand Rangarajan,Sanjay Ranka,2023-10-17 Video Based Machine Learning for Traffic Intersections describes the development of computer vision and machine learning based applications for Intelligent Transportation Systems ITS and the challenges encountered during their deployment This book presents several novel approaches including a two stream convolutional network architecture for vehicle detection tracking and near miss detection an unsupervised approach to detect near misses in fisheye intersection videos using a deep learning model combined with a camera calibration and spline based mapping method and algorithms that utilize video analysis and signal timing data to accurately detect and categorize events based on the phase and type of conflict in pedestrian vehicle and vehicle vehicle interactions The book makes use of a real time trajectory prediction approach combined with aligned Google Maps information to estimate vehicle travel time across multiple intersections Novel visualization software designed by the authors to serve traffic practitioners is used to analyze the efficiency and safety of intersections The software offers two modes a streaming mode and a historical mode both of which are useful to traffic engineers who need to quickly analyze trajectories to better understand traffic behavior at an intersection Overall this book presents a comprehensive overview of the application of computer vision and machine learning to solve transportation related problems Video Based Machine Learning for Traffic Intersections demonstrates how these techniques can be used to improve safety efficiency and traffic flow as well as identify potential conflicts and issues before they occur The range of novel approaches and techniques presented offers a glimpse of the exciting possibilities that lie ahead for ITS research and

development Key Features Describes the development and challenges associated with Intelligent Transportation Systems ITS Provides novel visualization software designed to serve traffic practitioners in analyzing the efficiency and safety of an intersection Has the potential to proactively identify potential conflict situations and develop an early warning system for real time vehicle vehicle and pedestrian vehicle conflicts Granular Video Computing Debarati B Chakraborty,Sankar K. Pal,2021 This volume links the concept of granular computing using deep learning and the Internet of Things to object tracking for video analysis It describes how uncertainties involved in the task of video processing could be handled in rough set theoretic granular computing frameworks Issues such as object tracking from videos in constrained situations occlusion overlapping handling measuring of the reliability of tracking methods object recognition and linguistic interpretation in video scenes and event prediction from videos are the addressed in this volume The book also looks at ways to reduce data dependency in the context of unsupervised without manual interaction labeled data prior information training This book may be used both as a textbook and reference book for graduate students and researchers in computer science electrical engineering system science data science and information technology and is recommended for both students and practitioners working in computer vision machine learning video analytics image analytics artificial intelligence system design rough set theory granular computing and soft computing *Data Mining of Traffic Video Sequences* Ajay J. Joshi,2009 Automatically analyzing video data is extremely important for applications such as monitoring and data collection in transportation scenarios Machine learning techniques are often employed in order to achieve these goals of mining traffic video to find interesting events Typically learning based methods require significant amount of training data provided via human annotation For instance in order to provide training a user can give the system images of a certain vehicle along with its respective annotation The system then learns how to identify vehicles in the future however such systems usually need large amounts of training data and thereby cumbersome human effort In this research we propose a method for active l earning in which the system interactively queries the human for annotation on the most informative instances In this way learning can be accomplished with lesser user effort without compromising performance Our system is also efficient computationally thus being feasible in real data mining tasks for traffic video sequences **Deep Learning for Semantic Video Understanding** Sourabh Kulhare,2017 The field of computer vision has long strived to extract understanding from images and videos sequences The recent flood of video data along with massive increments in computing power have provided the perfect environment to generate advanced research to extract intelligence from video data Video data is ubiquitous occurring in numerous everyday activities such as surveillance traffic movies sports etc This massive amount of video needs to be analyzed and processed efficiently to extract semantic features towards video understanding Such capabilities could benefit surveillance video analytics and visually challenged people While watching a long video humans have the uncanny ability to bypass unnecessary information and concentrate on the important events These key events can be used as a higher level

description or summary of a long video Inspired by the human visual cortex this research affords such abilities in computers using neural networks Useful or interesting events are first extracted from a video and then deep learning methodologies are used to extract natural language summaries for each video sequence Previous approaches of video description either have been domain specific or use a template based approach to fill detected objects such as verbs or actions to constitute a grammatically correct sentence This work involves exploiting temporal contextual information for sentence generation while working on wide domain datasets Current state of the art video description methodologies are well suited for small video clips whereas this research can also be applied to long sequences of video This work proposes methods to generate visual summaries of long videos and in addition proposes techniques to annotate and generate textual summaries of the videos using recurrent networks End to end video summarization immensely depends on abstractive summarization of video descriptions State of the art neural language attention joint models have been used to generate textual summaries Interesting segments of long video are extracted based on image quality as well as cinematographic and consumer preference This novel approach will be a stepping stone for a variety of innovative applications such as video retrieval automatic summarization for visually impaired persons automatic movie review generation video question and answering systems Abstract **Efficient Deep Learning Models for Video Abstraction** Mrigank Rochan,2020 With the revolution in digital video technology video data are ubiquitous and explosively growing There is a compelling need to develop efficient automated techniques to manage video data Therefore video abstraction is of significant interest to the computer vision research community The objective in video abstraction is to automatically create a short visual summary of a long input video so that a user can get certain perspectives of the video without watching or accessing it entirely This mechanism would allow to easily preview categorize search and edit the huge amount of video data In this thesis we push the state of the art in video abstraction in several ways Firstly we develop fully convolutional sequence deep learning models that address the computational limitations of the previous deep learning models for video abstraction Secondly we propose a new formulation of unpaired training data for the model learning to reduce the need of expensive labeled training data for supervised learning Thirdly since video abstraction has a degree of subjectiveness to it we realize a model that yields personalized and user specific predictions by referring to the user s previously created summaries Lastly we extend this user adaptive model such that it can handle natural language textual queries from users and make predictions that are semantically related to the queries Although we focus on video abstraction in this thesis we believe that our models can potentially be applied to other video understanding problems e g video classification action recognition and video captioning

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Chapter 4 Deep Learning Techniques For Roadside Video Data Introduction

In this digital age, the convenience of accessing information at our fingertips has become a necessity. Whether its research papers, eBooks, or user manuals, PDF files have become the preferred format for sharing and reading documents. However, the cost associated with purchasing PDF files can sometimes be a barrier for many individuals and organizations. Thankfully, there are numerous websites and platforms that allow users to download free PDF files legally. In this article, we will explore some of the best platforms to download free PDFs. One of the most popular platforms to download free PDF files is Project Gutenberg. This online library offers over 60,000 free eBooks that are in the public domain. From classic literature to historical documents, Project Gutenberg provides a wide range of PDF files that can be downloaded and enjoyed on various devices. The website is user-friendly and allows users to search for specific titles or browse through different categories. Another reliable platform for downloading Chapter 4 Deep Learning Techniques For Roadside Video Data free PDF files is Open Library. With its vast collection of over 1 million eBooks, Open Library has something for every reader. The website offers a seamless experience by providing options to borrow or download PDF files. Users simply need to create a free account to access this treasure trove of knowledge. Open Library also allows users to contribute by uploading and sharing their own PDF files, making it a collaborative platform for book enthusiasts. For those interested in academic resources, there are websites dedicated to providing free PDFs of research papers and scientific articles. One such website is Academia.edu, which allows researchers and scholars to share their work with a global audience. Users can download PDF files of research papers, theses, and dissertations covering a wide range of subjects. Academia.edu also provides a platform for discussions and networking within the academic community. When it comes to downloading Chapter 4 Deep Learning Techniques For Roadside Video Data free PDF files of magazines, brochures, and catalogs, Issuu is a popular choice. This digital publishing platform hosts a vast collection of publications from around the world. Users can search for specific titles or explore various categories and genres. Issuu offers a seamless reading experience with its user-friendly interface and allows users to download PDF files for offline reading. Apart from dedicated platforms, search engines also play a crucial role in finding free PDF files. Google, for instance, has an advanced search feature that allows users to filter results by file type. By specifying the file type as "PDF," users can find websites that offer free PDF downloads on a specific topic. While downloading Chapter 4 Deep Learning Techniques For Roadside Video Data free PDF files is convenient, its important to note that copyright laws must be respected. Always ensure that the PDF files you download are legally available for free. Many authors and publishers voluntarily provide free PDF versions of their work, but its essential to be cautious and verify the authenticity of the source before downloading Chapter 4 Deep Learning Techniques For Roadside Video Data. In

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