Face Detection Pose Estimation And Landmark Localization

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Biometric Recognition Springer
Object detection is a central and challenging task in computer vision. In this thesis, we first examine the "big data" hypothesis: object detection might be solved with simple models backed with massive training data. We empirically show that the performance of one of the state-of-the-art methods (discriminatively trained HoG templates) tends to saturate fast when fed with more data. The required training data may need to grow exponentially in order to produce a fixed improvement in accuracy. We also find that the key difficulties in detection are large variation in object appearance and more importantly, that the variation exhibits a "long tail" distribution: there are many rare cases with little training data, which makes those cases hard to model. This thesis addresses such challenges by proposing new representations that share information within and across object subcategories. Sharing allows one to learn models for rare subcategories in the long-tail where traditional approaches suffer from lack of training data. We investigate two methods for sharing. We first examine global models that share entire training examples across multiple subcategories. For example, an SUV image might be used to train both a car and truck subcategory model. We also examine local sharing that share subwindows of training examples through "parts". For example, nearly all vehicles contain wheel parts. By mixing and matching (or composing) different parts together, one can implicitly encode an exponentially large set of subcategory models, which could even represent those subcategories not encountered in the training data. We extensively experiment and evaluate our models on different benchmarks, and show superior performance over the state-of-the-art. Finally, we conclude with a detailed analysis of local part sharing for face analysis, perhaps the most well studied of all object recognition problems. By using semantically-defined parts (such as eyes, nose, lips), one can simultaneously perform face detection, pose estimation, and landmark localization with state-of-the-art accuracy, with a single model.

Biometric Recognition Springer
Keeping a driver focused on the road is one of the most critical steps in insuring the safe operation of a vehicle. The Strategic Highway Research Program 2 (SHRP2) has over 3,100 recorded videos of volunteer drivers during a period of 2 years. This extensive naturalistic driving study (NDS)

contains over one million hours of video and associated data that could aid safety researchers in understanding where the driver s attention is focused. Manual analysis of this data is infeasible, therefore efforts are underway to develop automated feature extraction algorithms to process and characterize the data. The real-world nature, volume, and acquisition conditions are unmatched in the transportation community, but there are also challenges because the data has relatively low resolution, high compression rates, and differing illumination conditions. A smaller dataset, the head pose validation study, is available which used the same recording equipment as SHRP2 but is more easily accessible with less privacy constraints. In this work we report initial head pose accuracy using commercial and open source face pose estimation algorithms on the head pose validation data set.

Human Face Detection and Head Pose Estimation on Image and Video CRC Press
The six volume set LNCS 11361-11366 constitutes the proceedings of the 14th Asian Conference on Computer Vision, ACCV 2018, held in Perth, Australia, in December 2018. The total of 274 contributions was carefully reviewed and selected from 979 submissions during two rounds of reviewing and improvement. The papers focus on motion and tracking, segmentation and grouping, image-based modeling, dep learning, object recognition object recognition, object detection and categorization, vision and language, video analysis and event recognition, face and gesture analysis, statistical methods and learning, performance evaluation, medical image analysis, document analysis, optimization methods, RGBD and depth camera processing, robotic vision, applications of computer vision.

Face Detection and Recognition on Mobile Devices Springer
This book constitutes the refereed proceedings of the 11th Chinese Conference on Biometric Recognition, CCBR 2016, held in Chengdu, China, in October 2016. The 84 revised full papers presented in this book were carefully reviewed and selected from 138 submissions. The papers focus on Face Recognition and Analysis; Fingerprint, Palm-print and Vascular Biometrics; Iris and Ocular Biometrics; Behavioral Biometrics; Affective Computing; Feature Extraction and Classification Theory; Anti-Spoofing and Privacy; Surveillance; and DNA and Emerging Biometrics.

Pattern Recognition and Artificial Intelligence Face Detection and Pose Estimation for Multimedia ApplicationsMulti-view Face Detection and Pose EstimationBaseline Face Detection, Head Pose Estimation, and Coarse Direction Detection for Facial Data in the SHRP2 Naturalistic Driving StudyKeeping a driver focused on the road is one of the most critical steps in insuring the safe operation of a vehicle. The Strategic Highway Research Program 2 (SHRP2) has over 3,100 recorded videos of volunteer drivers during a period of 2 years. This extensive naturalistic driving study (NDS) contains over

one million hours of video and associated data that could aid safety researchers in understanding where the driver s attention is focused. Manual analysis of this data is infeasible, therefore efforts are underway to develop automated feature extraction algorithms to process and characterize the data. The real-world nature, volume, and acquisition conditions are unmatched in the transportation community, but there are also challenges because the data has relatively low resolution, high compression rates, and differing illumination conditions. A smaller dataset, the head pose validation study, is available which used the same recording equipment as SHRP2 but is more easily accessible with less privacy constraints. In this work we report initial head pose accuracy using commercial and open source face pose estimation algorithms on the head pose validation data set. Human Face Detection and Head Pose Estimation on Image and Video Toward Category-Level Object Recognition

"Firstly, the thesis proposes a generic learning strategy using support vector regression [11] to estimate the approximate pose of a 3D scan. The support vector machine (SVM) is trained on range images in several poses, belonging to a small set of individuals. This thesis also examines the relationship between size of the range image and the accuracy of the pose prediction from the scan." --

Advances in Face Detection and Facial Image Analysis Springer

This book constitutes the proceedings of the 12th International Conference on Network and System Security, NSS 2018, held in Hong Kong, China, in August 2018. The 26 revised full papers and 9 short papers presented in this book were carefully reviewed and selected from 88 initial submissions. The papers cover a wide range of topics in the field, including blockchain, mobile security, applied cryptography, authentication, biometrics, IoT, privacy, and education.

Biometric Recognition Springer

The 4-volume set LNCS 13019, 13020, 13021 and 13022 constitutes the refereed proceedings of the 4th Chinese Conference on Pattern Recognition and Computer Vision, PRCV 2021, held in Beijing, China, in October-November 2021. The 201 full papers presented were carefully reviewed and selected from 513 submissions. The papers have been organized in the following topical sections: Object Detection, Tracking and Recognition; Computer Vision, Theories and Applications; Multimedia Processing and Analysis; Low-level Vision and Image Processing; Biomedical Image Processing and Analysis; Machine Learning, Neural Network and Deep Learning; and New Advances in Visual Perception and Understanding.

Multimodal Technologies for Perception of Humans Springer

This book constitutes the thoroughly refereed post-proceedings of the First International CLEAR 2006 Evaluation Campaign and Workshop on Classification of Events, Activities and Relationships for evaluation of multimodal technologies for the perception of humans, their activities and interactions. The workshop was held in the UK in April 2006. The papers were carefully reviewed and selected for inclusion in the book.

Emerging Trends in Intelligent Computing and Informatics Springer Nature

As a reliable indicator of visual gaze direction, head pose implies a person's visual attention and interest. Therefore, head pose information extracted from face images serves as important input in many applications. In this thesis, a coarse-to-fine head pose estimation method is proposed, by decomposing the original pose space in a hierarchical structure. The estimation begins with a coarse step to identify a subspace that encompasses a set of head pose candidates. Then a subsequent fine estimation is conducted within the subspace, generating a refined result. Besides, to eliminate irrelevant information within a face image, we propose to detect Region of Interest (ROI) by exploring importance degree of image points. Furthermore, we build an application of analyzing TV viewers' behaviors from video recordings, by integrating face detection, face tracking and head pose estimation. Based on head pose and face motion, a viewer's behavior is identified to be focused or unfocused.

Pattern Recognition Bentham Science Publishers

This book constitutes the proceedings of the Second International Conference on Pattern Recognition and Artificial Intelligence, ICPRAI 2020, which took place in Zhongshan, China, in October 2020. The 49 full and 14 short papers presented were carefully reviewed and selected for inclusion in the book. The papers were organized in topical sections as follows: handwriting and text processing; features and classifiers; deep learning; computer vision and image processing; medical imaging and applications; and forensic studies and medical diagnosis.

Subspace Learning for Face Detection, Recognition and Pose Estimation Springer Nature

The seven-volume set comprising LNCS volumes 8689-8695 constitutes the refereed proceedings of the 13th European Conference on Computer Vision, ECCV 2014, held in Zurich, Switzerland, in September 2014. The 363 revised papers presented were carefully reviewed and selected from 1444 submissions. The papers are organized in topical sections on tracking and activity recognition; recognition; learning and inference; structure from motion and feature matching; computational photography and low-level vision; vision; segmentation and saliency; context and 3D scenes; motion and 3D scene analysis; and poster sessions.

Computer Vision – ACCV 2020 Springer

The two volume set LNCS 9256 and 9257 constitutes the refereed proceedings of the 16th International Conference on Computer Analysis of Images and Patterns, CAIP 2015, held in Valletta, Malta, in September 2015. The 138 papers presented were carefully reviewed and selected from numerous submissions. CAIP 2015 is the sixteenth in the CAIP series of biennial international conferences devoted to all aspects of computer vision, image analysis and processing, pattern recognition, and related fields.

Deep Learning for Biometrics Springer Nature

Deep Learning is now synonymous with applied machine learning. Many technology giants (e.g. Google, Microsoft, Apple, IBM) as well as start-ups are focusing on deep learning-based techniques for data analytics and artificial intelligence. This technology applies quite strongly to biometrics. This book covers topics in deep learning, namely convolutional neural networks, deep belief network and stacked autoencoders. The focus is also on the application of these techniques to various biometric modalities: face, iris, palmprint, and fingerprints, while examining the future trends in deep learning and biometric research. Contains chapters written by authors who are leading researchers in biometrics. Presents a comprehensive overview on the internal mechanisms of deep learning. Discusses the latest developments in biometric research. Examines future trends in deep learning and biometric research. Provides extensive references at the end of each chapter to enhance further study.

Computer Vision – ACCV 2018 GRIN Verlag

This book constitutes the refereed proceedings of the 7th Chinese Conference on Biometric Recognition, CCBR 2012, held in Guangzhou, China, in December 2012. The 46 revised full papers were carefully reviewed and selected from 80 submissions. The papers address the problems in face, iris, hand biometrics, speaker, handwriting, gait, soft biometrics, security and other related topics, and contribute new ideas to research and development of reliable and practical solutions for biometric authentication.

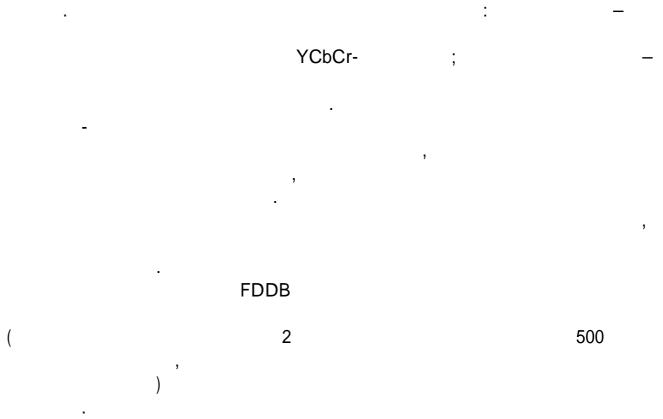*Integration of Human Feature Detection and Geometry Analysis for Real-time Face Pose*

Estimation and Gesture Recognition Springer

This two-volume set constitutes the proceedings of the 5th Asian Conference on ACPR 2019, held in Auckland, New Zealand, in November 2019. The 9 full papers presented in this volume were carefully reviewed and selected from 14 submissions. They cover topics such as: classification; action and video and motion; object detection and anomaly detection; segmentation, grouping and shape; face and body and biometrics; adversarial learning and networks; computational photography; learning theory and optimization; applications, medical and robotics; computer vision and robot vision; pattern recognition and machine learning; multi-media and signal processing and interaction.

Sharing Information Across Object Templates Springer

This timely text/reference presents a broad overview of advanced deep learning architectures for learning effective feature representation for perceptual and biometrics-related tasks. The text offers a showcase of cutting-edge research on the use of convolutional neural networks (CNN) in face, iris, fingerprint, and vascular biometric systems, in addition to surveillance systems that use soft biometrics. Issues of biometrics security are also examined. Topics and features: addresses the application of deep learning to enhance the performance of biometrics identification across a wide range of different biometrics modalities; revisits deep learning for face biometrics, offering insights from neuroimaging, and provides comparison with popular CNN-based architectures for face recognition; examines deep learning for state-of-the-art latent fingerprint and finger-vein recognition, as well as iris recognition; discusses deep learning for soft biometrics, including approaches for gesture-based identification, gender classification, and tattoo recognition; investigates deep learning for biometrics security, covering biometrics template protection methods, and liveness detection to protect against fake biometrics samples; presents contributions from a global selection of pre-eminent experts in the field representing academia, industry and government laboratories. Providing both an accessible introduction to the practical applications of deep learning in biometrics, and a comprehensive coverage of the entire spectrum of biometric modalities, this authoritative volume will be of great interest to all researchers, practitioners and students involved in related areas of computer vision, pattern recognition and machine learning.

Facial Pose Estimation and Face Recognition from Three-dimensional Data Springer

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Computer Vision -- ACCV 2014 Springer

Master's Thesis from the year 2017 in the subject Engineering - Computer Engineering, grade: 10, , course: M.Tech-ECE, language: English, abstract: Images containing faces are essential to intelligent vision-based human computer interaction, and research efforts in face processing include face recognition, face tracking, pose estimation, and expression recognition. The rapidly expanding research in face processing is based on the premise that information about a user's identity, state, and intent can be extracted from images and that computers can then react accordingly, e.g., by knowing person's identity, person may be authenticated to utilize a particular service or not. A first step of any face processing system is registering the locations in images where faces are present. The local binary pattern is a simple yet very efficient texture operator which labels the pixels of an image by thresholding the neighborhood of each pixel and considers the result as a binary number. The LBP method can be seen as a unifying approach to the traditionally divergent statistical and structural models of texture analysis. Perhaps the most important property of the LBP operator in real-world applications is its invariance against monotonic gray level changes caused, e.g., by illumination variations. Another equally important is its computational simplicity, which makes it possible to analyze images in challenging real-time settings. The success of LBP in face description is due to the discriminative power and computational simplicity of the LBP operator, and the robustness of LBP to mono-tonic gray scale changes caused by, for example, illumination variations. The use of histograms as features also makes the LBP approach robust to face misalignment and pose variations. For these reasons, the LBP methodology has already attained an established position in face analysis research. Because finding an efficient spatiotemporal representation for face analysis from videos is challenging, most of the existing works limit the scope of the problem by discarding the facial dynamics and only considering the structure. Motivated by the psychophysical findings which indicate that facial movements can provide valuable information to face analysis, spatiotemporal LBP approaches for face, facial expression and gender recognition from videos were described.

Computer Vision – ECCV 2018 Springer

This book presents the proceedings of the 4th International Conference of Reliable Information and Communication Technology 2019 (IRICT 2019), which was held in Pulai Springs Resort, Johor, Malaysia, on September 22– 23, 2019. Featuring 109 papers, the book covers hot topics such as artificial intelligence and soft computing, data science and big data analytics, internet of things (IoT), intelligent communication systems, advances in information security, advances in information systems and software engineering.

Hierarchical Integration of Stereo Analysis, Face Detection and Head Pose Estimation Elsevier
This hands-on guide gives an overview of computer vision and enables engineers to understand the implications and challenges behind mobile platform design choices. Using face-related algorithms as examples, the author surveys and illustrates how design choices and algorithms can be geared towards developing power-saving and efficient applications on resource constrained mobile platforms. Presents algorithms for face detection and recognition Explains applications of facial technologies on mobile devices Includes an overview of other computer vision technologies