Digital Vechile License Rc Book Insurance Tracing For Police

Gopisetti Naveen Venkata Sai, Sri.S.K.Alisha, Sri.V.Bhaskara Murthy
Mca Student, Senior Assistant Professor, Associate Professor
Dept Of Mca
B.V.Raju College, Bhimavaram

ABSTRACT: In this paper, we tackle the problem of car license plate detection and recognition in natural scene images. We propose a unified deep neural network, which can localize license plates and recognize the letters simultaneously in a single forward pass. The whole network can be trained end-to-end. In contrast to existing approaches which take license plate detection and recognition as two separate tasks and settle them step by step, our method jointly solves these two tasks by a single network. It not only avoids intermediate error accumulation but also accelerates the processing speed. For performance evaluation, four data sets including images captured from various scenes under different conditions are tested. Extensive experiments show the effectiveness and the efficiency of our proposed approach.

I. INTRODUCTION

DATA MINING

Data mining is an interdisciplinary subfield of computer science. It is the computational process of discovering patterns in large data sets ("big data") involving methods at the intersection of artificial intelligence, machine learning, statistics, and database systems. The overall goal of the data mining process is to extract information from a data set and transform it into an understandable structure for further use. Aside from the raw analysis step, it involves database and data management aspects, datapreprocessing, model and inference consider ations-interestingness-metrics, complexity considerations,post-processing of discovered structures, visualization,and online updating. Data mining is the analysis step of the "knowledge discovery in databases" process, or KDD. The actual data mining task is the automatic or semi-automatic analysis of large quantities of data to extract previously unknown, interesting patterns such as groups of data records (cluster analysis), unusual records (anomaly detection), and dependencies (association rule mining). This usually involves using database techniques such as spatial indices. These patterns can then be seen as a kind of summary of the input data, and may be used in further analysis or, for example, in machine learning and predictive analytics. For example, the data mining step might identify multiple groups in the data, which can then be used to obtain more accurate prediction results by a decision support system. Neither the data collection, data preparation, nor result interpretation and reporting is part of the data mining step, but do belong to the overall KDD process as additional steps.

The related terms data dredging, data fishing, and data snooping refer to the use of data mining methods to sample parts of a larger population data set that are (or may be) too small for reliable statistical inferences to be made about the validity of any patterns discovered. These methods can, however, be used in creating new hypotheses to test against the larger data populations.

Big Data concern large-volume, complex, growing data sets with multiple, autonomous sources. With the fast development of networking, data storage, and the data collection capacity, Big Data are now rapidly expanding in all science and engineering domains, including physical, biological and biomedical sciences. This paper presents a HACE theorem that characterizes the features of the Big Data revolution, and proposes a Big Data processing model, from the data mining perspective. This data-driven model involves demand-driven aggregation of information sources, mining and analysis, user interest modeling, and security and privacy considerations. We analyze the challenging issues in the data-driven model and also in the Big Data revolution.

BIG DATA

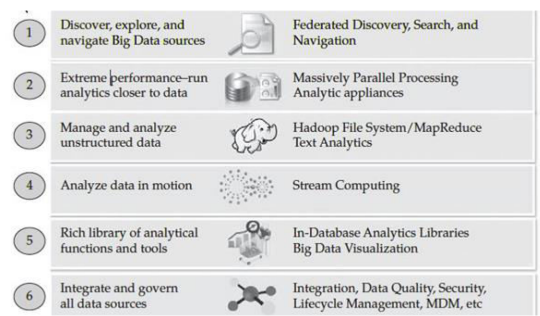
Big data is a collection of data sets so large and complex that it becomes difficult to process using on-hand database management tools. The challenges include capture, curation, storage, search, sharing, analysis, and visualization. The trend to larger data sets is due to the additional information derivable from analysis of a single large set of related data, as compared to separate smaller sets with the same total amount of data, allowing correlations to be found to "spot business trends, determine quality of research, prevent diseases, link legal citations, combat crime, and determine real-time roadway traffic conditions.

Put another way, big data is the realization of greater business intelligence by storing, processing, and analyzing data that was previously ignored due to the limitations of traditional data management technologies

The four dimensions of Big Data

- Volume: Large volumes of data
- Velocity: Quickly moving data
- Variety: structured, unstructured, images, etc.
- Veracity: Trust and integrity is a challenge and a must and is important for big data just as for traditional relational DBs
- Big Data is about better analytics!

The Big Data platform Manifesto



Some concepts

- No SQL (Not Only SQL): Databases that “move beyond” relational data models (i.e., no tables, limited or no use of SQL)
    - Focus on retrieval of data and appending new data (not necessarily tables)
    - Focus on key-value data stores that can be used to locate data objects
    - Focus on supporting storage of large quantities of unstructured data
    - SQL is not used for storage or retrieval of data
    - No ACID (atomicity, consistency, isolation, durability)

Hadoop

- Hadoop is a distributed file system and data processing engine that is designed to handle extremely high volumes of data in any structure.
- Hadoop has two components:
  - The Hadoop distributed file system (HDFS), which supports data in structured relational form, in unstructured form, and in any form in between
  - The MapReduce programming paradigm for managing applications on multiple distributed servers
- The focus is on supporting redundancy, distributed architectures, and parallel processing

Some Hadoop Related Names to Know

- Apache Avro: designed for communication between Hadoop nodes through data serialization
- Cassandra and Hbase: a non-relational database designed for use with Hadoop
- Hive: a query language similar to SQL (HiveQL) but compatible with Hadoop
- Mahout: an AI tool designed for machine learning; that is, to assist with filtering data for analysis and exploration
- Pig Latin: A data-flow language and execution framework for parallel computation
- ZooKeeper: Keeps all the parts coordinated and working together

What to do with the data

II. LITURATURE SURVEY

A method for text localization and recognition in real-world images

A general method for text localization and recognition in real-world images is presented. The proposed method is novel, as it departs from a strict feed-forward pipeline and replaces it by a hypothesesverification framework simultaneously processing multiple text line hypotheses, uses synthetic fonts to train the algorithm eliminating the need for time-consuming acquisition and labeling of real-world training data and exploits Maximally Stable Extremal Regions which provides robustness to geometric and illumination conditions. The performance of the method is evaluated on two standard datasets. On the Char dataset, a recognition rate is achieved, 18% higher than the state-of-the-art. The paper is first to report both text detection and recognition results on the standard and rather challenging dataset. The text localization works for number of alphabets and the method is easily adapted to recognition of other scripts, cyrillics. 1 Introduction

Real-time scene text localization and recognition

An end-to-end real-time scene text localization and recognition method is presented. The real-time performance is achieved by posing the character detection problem as an efficient sequential selection from the set of Extremal Regions (ERs). The ER detector is robust to blur, illumination, color and texture variation and handles lowcontrast text. In the first classification stage, the probability of each ER being a character is estimated using novel features calculated with O(1) complexity per region tested. Only ERs with locally maximal probability are selected for the second stage, where the classification is improved using more computationally expensive features. A highly efficient exhaustive search with feedback loops is then applied to group ERs into words and to select the most probable character segmentation. Finally, text is recognized in an OCR stage trained using synthetic fonts. The method was evaluated on two public datasets. On the ICDAR 2011 dataset, the method achieves state-of-theart text localization results amongst published methods and it is the first one to report results for end-to-end text recognition. On the more challenging Street View Text dataset, the method achieves state-of-the-art recall. The robustness of the proposed method against noise and low contrast of characters is demonstrated by "false positives" caused by detected watermark text in the dataset.

End-to-end scene text recognition

This paper focuses on the problem of word detection and recognition in natural images. The problem is significantly more challenging than reading text in scanned documents, and has only recently gained attention from the computer vision community. Sub-components of the problem, such as text detection and cropped image word recognition, have been studied in isolation However, what is unclear is how these recent approaches contribute to solving the end-to-end problem of word recognition. We fill this gap by constructing and evaluating two systems. The first, representing the de facto state-of-the-art, is a two stage pipeline consisting of text detection followed by a leading OCR engine. The second is a system rooted in generic object recognition, an extension of our previous work in We show that the latter approach achieves superior performance. While scene text recognition has generally been treated with highly domain-specific methods, our results demonstrate the suitability of applying generic computer vision methods. Adopting this approach opens the door for real world scene text recognition to benefit from the rapid advances that have been taking place in object recognition.

"End-to-end text recognition with convolutional neural networks

Full end-to-end text recognition in natural images is a challenging problem that has received much attention recently. Traditional systems in this area have relied on elaborate models incorporating carefully handengineered features or large amounts of prior knowledge. In this paper, we take a different route and combine the representational power of large, multilayer neural networks together with recent developments in unsupervised feature learning, which allows us to use a common framework to train highly-accurate text detector and character recognizer modules. Then, using only simple off-the-shelf methods, we integrate these two modules into a full end-to-end, lexicon-driven, scene text recognition system that achieves state-of-the-art performance on standard benchmarks, namely Street View Text

"Deep features for text spotting

The goal of this work is text spotting in natural images. This is divided into two sequential tasks: detecting words regions in the image, and recognizing the words within these regions. We make the following contributions: first, we develop a Convolutional Neural Network classifier that can be used for both tasks. has a novel architecture that enables efficient feature sharing using a number of layers in common) for text detection, character case-sensitive and insensitive classification, and bigram classification. It exceeds the state-of-the-art performance for all of these. Second, we make a number of technical changes over the traditional architectures, including no downsampling for a per-pixel sliding window, and multi-mode learning with a mixture of linear models Third, we have a method of automated data mining of Flickr, that generates word and character level annotations. Finally, these components are used together to form an end-to-end, state-of-the-art text spotting system. We evaluate the text-spotting system on two standard benchmarks, the ICDAR Robust Reading data set and the Street View Text data set, and demonstrate improvements over the state-of-the-art on multiple measures

III. EXISTING SYSTEM

Previous work on license plate detection and recognition usually considers plate detection and recognition as two separate tasks, and solves them respectively by different methods. However, the tasks of plate detection and recognition are highly correlated. Accurate bounding boxes obtained via detection methods can improve the recognition accuracy, while the recognition result can be used to eliminate false positives vice versa. Thus in this paper, we propose a unified framework to jointly tackle these two tasks at the same level.

DISADVANTAGE:

License plates are normally in a rectangular shape with a specific aspect ratio, and they present higher edge density than elsewhere in the image, so edge information is used widely to detect license plates. Expectation Maximization (EM) was applied for edge clustering which extracts the regions with dense sets of edges and with shapes similar to plates as the candidate license plates.

IV. PROPOSED SYSTEM

A single unified deep neural network is proposed, which can detect license plates from an image and recognize the labels all at once. The whole framework involves no heuristic processes, such as the use of plate colors or character space, and avoids intermediate procedures like character grouping or separation. It can be trained end-to-end, with only the image, plate positions and labels needed for training. The resulting system achieves high accuracy on both plate detection and letter recognition.

By integrating plate recognition directly into the detection pipeline, instead of addressing them by separate models, the resulting system is more efficient. With our framework, we do not need to crop the detected license plates from the input image and then recognize them by a separate network.

ADVANTAGE

In an edge-based method was developed for plate detection. Expectation Maximization (EM) was applied for edge clustering which extracts the regions with dense sets of edges and with shapes similar to plates as the candidate license plates. In, a novel line density filter approach was proposed to connect regions with high edge density and remove sparse regions in each row and column from a binary edge image. Edge-based methods are fast in computation, but they cannot be applied to complex images as they are too sensitive to unwanted edge.

V. MODULE

Region of Interest (RoI):

Region of Interest (RoI) pooling layer, multi-layer perceptrons for plate detection and bounding box regression, and RNNs with CTC for plate recognition. With this architecture, the plate detection and recognition can be achieved simultaneously, with one network and a single forward evaluation of the input image.

Plate Proposal Generation:

Designed a Region Proposal Network (RPN) for object detection, which can generate candidate objects in images. RPN is a fully convolution network which takes the low-level convolution features as input, and outputs a set of potential bounding boxes. It can be trained end-to-end so that high quality proposals can be generated. In this work, we modify RPN slightly to make it suitable for car license plate proposal.

Proposal Processing and Pooling:

As we state before, 256 anchors are sampled from the $M \times N \times k$ anchors to train RPN. After bounding box regression, the 256 samples will later be used for plate detection and recognition.

Plate Recognition Network:

Plate recognition network aims to recognize each character in RoIs based on the extracted region features. To avoid the challenging task of character segmentation, we regard the plate recognition as a sequence labeling problem. Bidirectional RNNs (BRNNs) with CTC loss are employed to label the sequential features.

VI. CONCLUSION

In this paper we have presented a jointly trained network for simultaneous car license plate detection and recognition. With this network, car license plates can be detected and recognized all at once in a single forward pass, with both high accuracy and efficiency. By sharing convolutional features with both detection and recognition network, the model size decreases largely. The whole network can be trained approximately end-to-end, without intermediate processing like image cropping or character separation. Comprehensive evaluation and comparison on three datasets with different approaches validate the advantage of our method. In the future,we will extend our network to multi-oriented car license plates. In addition, with the time analysis, it is found that take about half of the whole processing time. Hence, we will optimize to accelerate the processing speed.

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