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An Extensive Survey on Deep Learning Applications

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ABSTRACT

Deep learning (DL) is a branch of machine learning based on a set of algorithms that attempt to model high level abstractions in data. It is a new area of Machine Learning research, which has been presented with the goal of drawing Machine Learning nearer to one of its unique objective, Artificial Intelligence. Deep Learning is used by Google in its voice and image recognition algorithms, by Netflix and Amazon to decide what you want to watch or buy next, and by researchers at MIT to predict the future. DL is used in various fields for achieving multiple levels of abstraction like sound, text, images feature extraction etc. DL is about art of different fields for accomplishing numerous levels of deliberation like sound, content, pictures include extraction and so on. We have done an extensive literature review and surveyed the application of deep learning techniques on various fields. This paper will provide an intuition to apply this DL on selected fields like image processing, data analytics, speech recognition etc.

Keywords
S***upervised Learning, Speech recognition, image processing.***

INTRODUCTION

The performance of machine learning methods is heavily dependent on the choice of data representation (or features) on which they are applied. For that reason, much of the actual effort in deploying machine learning algorithms [2] goes into the design of preprocessing pipelines and data transformations that result in a representation of the data that can support effective machine learning. Such feature engineering is important but labor-intensive and highlights the weakness of current learning algorithms: their inability to extract and organize the discriminative information from the data. Feature engineering[9]is a way to take advantage of human ingenuity and prior knowledge to compensate for that weakness. In order to expand the scope and ease of applicability of machine learning, it would be highly desirable to make learning algorithms less dependent on feature engineering, so that novel applications could be constructed faster, and more importantly, to make progress towards Artificial Intelligence (AI).

DL IN IMAGE PROCESSING

Yi Sun [4] et al has proposed a hybrid convolutional network (ConvNet)-Restricted Boltzmann Machine (RBM) model for face verification in wild conditions. A key commitment of this work is to

straightforwardly learn social visual features,which demonstrate character similitudes, from crude pixels of face sets with a cross breed profound system[8]. The profound ConvNets in our model copy the essential visual cortex to mutually separate nearby social visual elements from two face pictures contrasted and the educated channel sets.

DL IN SPEECH RECOGNITION

Li Deng and John C[1]. Platt survey presents that deep learning systems have dramatically improved the accuracy of speech recognition, and various deep architectures and learning methods have been developed with distinct strengths[7],[16] and weaknesses in recent years. Deep learning is typically applied to computer vision, speech recognition, and NLP. These are non-linear classification problems[10] where the inputs are highly hierarchal in nature. In 2011, Google Brain project, created a neural network trained with deep learning algorithms, which recognized high level concepts, like cats, after watching just YouTube videos and without being told what a "cat" is. Facebook[6] is creating solutions using deep learning expertise to better identify faces and objects in the photos and videos uploaded to Facebook each day[13,[14],[15]. Another example of deep learning in action is voice recognition like Google Now and Apple's Siri. According to Google, the voice error rate in the new version of Android stands at 25% lower than previous versions of the software after adding insights from deep learning.

DL IN DISTRIBUTED REPRESENTATIONS AND LANGUAGE PROCESSING

Deep learning hypothesis[3] demonstrates that deep nets have two distinctive exponential points of interest over exemplary learning calculations that don't utilize circulated representations. Both of these favorable circumstances emerge from the force of organization and rely on upon the hidden information producing dispersion having a fitting componential structure. To start with, learning dispersed representations empower speculation to new blends of the estimations of educated elements past those seen amid preparing (for instance, 2n mixes are conceivable with n twofold elements). Second, making layers out of representation[5] in a deep net brings the potential for another exponential preferred standpoint (exponential in the profundity). Deep architectures [12]are composed of multiple levels of non-linear operations, such as in neural nets with many hidden layers or in complicated propositional formulae re-using many sub-formulae. Searching the parameter space of deep architectures is a difficult task, but learning algorithms such as those for Deep Belief Networks have recently been proposed to tackle this problem with notable success, beating the state-of-the-art in certain areas[11].

CONCLUSION

Deep learning has turned into an interesting issue in machine learning, since it can give world record brings about various characterization and relapse issues and datasets. Numerous partnerships including

Google, Microsoft, Nokia study it effectively. Seeing deep adapting admirably requires scientific development and great information of probabilistic demonstrating. Learning calculations are complicated, and great instatement is critical. The field is growing quickly, with new structures and learning techniques presented constantly. The rundown of unsupervised models we have looked into in this section is most certainly not thorough. Amid the most recent couple of years, various new deep learning models for unsupervised learning have been proposed .Scientist as of late proposed a somewhat particular deep learning- based structure for unsupervised learning, called generative stochastic system which plans to take in a Markov chain Monte Carlo move administrator rather than a full likelihood circulation.

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