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A REVIEW ON AUTOMATING E-GOVERNMENT SERVICES WITH ARTIFICAL INTELLIGENCE

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ABSTRACT

Artificial Intelligence (AI) has recently advanced the state-of-art results in an ever-growing number of domains. However, it still faces several challenges that hinder its deployment in the e-government applications both for improving the e-government systems and the e-government-citizens interactions. In this paper, we address the challenges of e-government systems and propose a framework that utilizes AI technologies to automate and facilitate e-government services. Specifically, werst outline a framework for the management of e-government information resources. Second, we develop a set of deep learning models that aim to automate several e-government services. Third, we propose a smart e-government platform architecture that supports the development and implementation of AI applications of e-government. Our overarching goal is to utilize trustworthy AI techniques in advancing the current state of e-government services in order to minimize processing times, reduce costs, and improve citizens' satisfaction.

Keywords: E-Government, Artificial Intelligence, Deep Learning Models, Smart Government Platform, AI-based Public Services

INTRODUCTION

Articial Intelligence (AI) has been around for some decades in several theoretical forms and complicated systems; however, only recent advances in computational powers and big data have enabled AI to achieve outstanding results in an ever-growing number of domains. For example, AI have tremendously advanced the areas of computer vision [1],medical applications [2], natural language processing [3],reinforcement learning [4], and several other domains.AI can be defined as the ability of a computer to imitate the intelligence of human behavior while improving its own performance. AI is not only robotics, rather an intelligent behavior of an autonomous machine that describes the brain of the machine and not its body; it can drive a car, play a game, and perform diverse sophisticated jobs. AI is a that falls at the intersections of several other domains, including Machine Learning [5], Deep Learning [6], Natural Languages Processing [3], Context Awareness [7], and Data Security and Privacy [8]. Figure 1 illustrates the intersections and relationship of the AI with related .

Machine Learning (ML) is the ability of an algorithm to learn from prior data in order to produce a smart behavior and make correct decisions in various situations that it has never faced before. ML algorithms are enabled by training a computational model, which is the process of exposing an algorithm to a large dataset (e.g., citizens' demographics) in order to predict future behaviors (e.g., employment rates).The process of learning from prior datasets is known as a supervised learning.

Despite the fact that deep learning has improved the state-of-art results in several domains, it is still evident that e-government applications face several challenges regarding adapting deep learning [10]. First, given the recent and rapid advances in the deep learning domain, it is becoming more difficult to and experts of this technology who are capable of developing efficient and reliable AI applications, especially in third world countries. Second, the development lifecycle of AI projects, specially deep learning, has introduced a new set of development challenges. In particular, traditional software development focuses on meeting a set of required

functional and non-functional requirements; in contract, deep learning development focuses on optimizing a specific metric based on a large set of parameters, which is done in a unsystematic search approach. Third, integrating AI and deep learning applications in e-government services requires strong policies and measures on data security and privacy. However, there are still challenges that hinder the creation of concrete standards for data security and privacy, including

citizen- government trust, transparency, and other technical diffculties related to developing and implementing secure systems.

EXISTING SYSTEM

Recently, many countries have adopted e-government services in various departments and many autonomous applications . While there are several studies conducted for enhancing e-government services, only a few of them address utilizing recent advances in AI and deep learning in the automation of e-government services. Therefore, there is still an urgent need to utilize state-of-the-art AI techniques and algorithms to address e-government challenges and needs.

In contrast, implementing e-government applications still faces several challenges, including the following:

Trust: trusting online services depends heavily on a couple of factors including, the citizens trust in the government itself, the quality of the online services, and the personal believes (e.g., there still a large number of citizens who prefer to handle paper applications rather than web services).

Lack of experts: implementing high-quality online services requires the establishment of the right team of experts that covers all involved practice areas from web development to security and privacy.

Inaccessibility: several third world countries still face significant issues on accessing the internet and its services.

Security: state-of-the-art security measures are required to secure e-government applications and the citizen's privacy.

PROPOSED SYSTEM

In this paper author describing concept to automate government services with Artificial Intelligence technology such as Deep Learning algorithm called Convolution Neural Networks (CNN). Government can introduce new schemes on internet and peoples can read news and notifications of such schemes and then peoples can write opinion about such schemes and this opinions can help government in taking better decisions. To detect public opinions about schemes automatically we need to have software like

human brains which can easily understand the opinion which peoples are writing is in favour of positive or negative.

To build such automated opinion detection author is suggesting to build CNN model which can work like human brains. This CNN model can be generated for any services and we can make it to work like automated decision making without any human interactions. To suggest this technique author already describing concept to implement multiple models in which one model can detect or recognize human hand written digits and second model can detect sentiment from text sentences which can be given by human about government schemes. In our extension model we added another model which can detect sentiment from person face image. Person face expressions can describe sentiments better than words or sentences. So our extension work can predict sentiments from person face images.

LITERATURE SURVEY

1) **K. He, X. Zhang, S. Ren, and J. Sun, ``Deep residual learning for image recognition,'' in Proc. IEEE Conf. Comput. Vis. Pattern Recognit., Jun. 2016, pp. 770-778.**

ABSTRACT

In today's world, computer vision technology has become a very important direction in the field of Internet applications. As one of the basic problems of computer vision, object detection has become the basis of many vision tasks. Whether we need to realize the interaction between images and text or recognize fine categories, it provides reliable information. This article reviews the development of object detection networks. Starting from RCNN, we introduce object detection based on candidate regions, including Fast R-CNN, Faster R-CNN, etc.; and then start to introduce single-shot networks including YOLO, SSD, and Retina Net, etc. Detectors are the most excellent methods at present. By reviewing the current research status of object detection networks, it provides suggestions for the further development trend and research of object detection.

2) **Y.-D. Zhang, Y. Zhang, X.-X. Hou, H. Chen, and S.-H. Wang, ``Sevenlayer deep neural network based on sparse autoencoder for voxelwise detection of cerebral microbleed,'' Multimedia Tools Appl., vol. 77, no. 9, pp. 10521-10538, May 2018.**

ABSTRACT

In order to detect the cerebral microbleed (CMB) voxels within brain, we used susceptibility weighted imaging to scan the subjects. Then, we used undersampling to solve the accuracy paradox caused from the imbalanced data between CMB voxels and non-CMB voxels. we developed a seven-layer deep neural network (DNN), which includes one input layer, four sparse autoencoder layers, one softmax layer, and one output layer. Our simulation showed this method achieved a sensitivity of 95.13%, a specificity of 93.33%, and an accuracy of 94.23%. The result is better than three state-of-the-art approaches.

3) **S. Venugopalan, H. Xu, J. Donahue, M. Rohrbach, R. Mooney, and K. Saenko, ``Translating videos to natural language using deep recurrent neural networks,'' 2014, arXiv:1412.4729. [Online]. Available:https://arxiv.org/abs/1412.4729.**

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Artificial Intelligence (AI) has recently advanced the state-of-art results in an evergrowing number of domains. However, it still faces several challenges that hinder its deployment in the e-government applications both for improving the e-government systems and the e-government-citizens interactions. In this paper, we address the challenges of egovernment systems and propose a framework that utilizes AI technologies to automate and facilitate e-government services. Specifically, werst outline a framework for the management of e-government information resources. Second, we develop a set of deep learning models that aim to automate several e-government services. Third, we propose a smart e-government platform architecture that supports the development and implementation of AI applications of e-government. Our overarching goal is to utilize trustworthy AI techniques in advancing the current state of e-government services in order to minimize processing times, reduce costs, and improve citizens' satisfaction.

4) **D. Silver, A. Huang, C. J. Maddison, A. Guez, L. Sifre, G. van den Driessche, J. Schrittwieser, I. Antonoglou, V. Panneershelvam, M. Lanctot, S. Dieleman, D. Grewe, J. Nham, N. Kalchbrenner, I. Sutskever, T. Lillicrap, M. Leach, K. Kavukcuoglu, T. Graepel, and D. Hassabis, ``Mastering the game of Go with deep neural networks and tree search,'' Nature, vol. 529, no. 7587, pp. 484-489, 2016.**

ABSTRACT

The game of Go has long been viewed as the most challenging of classic games for artificial intelligence owing to its enormous search space and the difficulty of evaluating board positions and moves. Here we introduce a new approach to computer Go that uses 'value networks' to evaluate board positions and 'policy networks' to select moves. These deep neural networks are trained by a novel combination of supervised learning from human expert games, and reinforcement learning from games of self-play. Without any lookahead search, the neural networks play Go at the level of state-of-the-art Monte Carlo tree search programs that simulate thousands of random games of self-play. We also introduce a new search algorithm that combines Monte Carlo simulation with value and policy networks. Using this search algorithm, our program AlphaGo achieved a 99.8% winning rate against other Go programs, and defeated the human European Go champion by 5 games to 0. This is the first time that a computer program has defeated a human professional player in the full-sized game of Go, a feat previously thought to be at least a decade away.

MODULES DESCRIPTION

The output form of an information system should accomplish one or more of the following objectives.

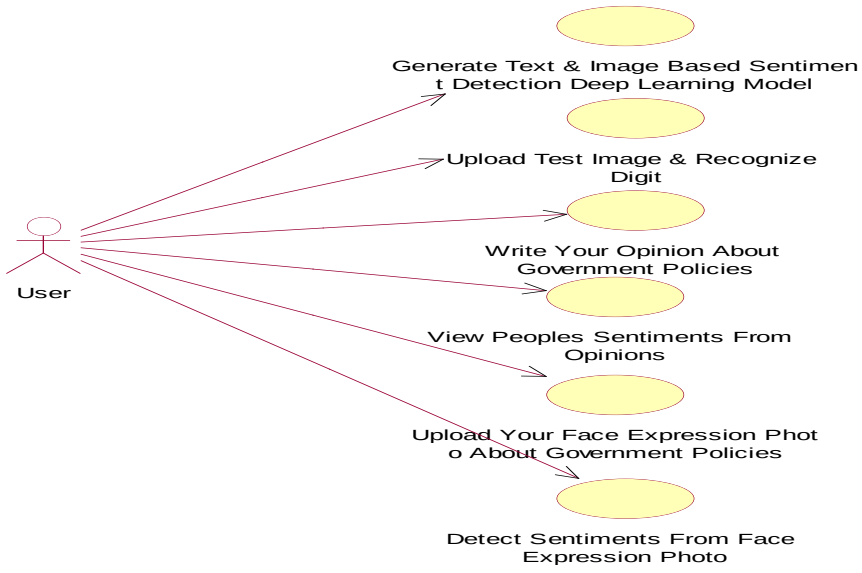
- Convey information about past activities, current status or projections of the
- Future.
- Signal important events, opportunities, problems, or warnings.
- Trigger an action.
- Confirm an action.

USER:

1) Generate Hand Written Digits Recognition Deep Learning Model: using this model we are building CNN based hand written model which take digit image as input and then predict the name of digit. CNN model can be generated by taking two types of images called train (train images contain all possible shapes of digits human can write in all possible ways) and test (Using test images train model will be tested whether its giving better prediction accuracy). Using all train images CNN will build the training model. While building model we will extract features from train images and then build a model. While testing also we will extract features from test image and then apply train model on that test image to classify it.
2) Generate Text & Image Based Sentiment Detection Deep Learning Model: using this module we will generate text and image based sentiment detection model. All possible positive and negative words will be used to generate text based sentiment model. All different types of facial expression images will be used to generate image based sentiment model. Whenever we input text or image then train model will be applied on that input to predict its sentiments.
3) Upload Test Image & Recognize Digit: By using this module we will upload text image and apply train model to recognize digit.
4) Write Your Opinion About Government Policies: using this module we will accept user's opinion and then save that opinion inside application to detect sentiment from opinion.
5) View Peoples Sentiments From Opinions: using this module user can see all users opinion and their sentiments detected through CNN model.
6) Upload Your Face Expression Photo About Government Policies: using this module user will upload his image with facial expression which indicates whether user is satisfy with this scheme or not.

Detect Sentiments From Face Expression Photo: using this module different users can see the facial expression image and detected sentiment which is uploaded by past users.

USE CASE DIAGRAM



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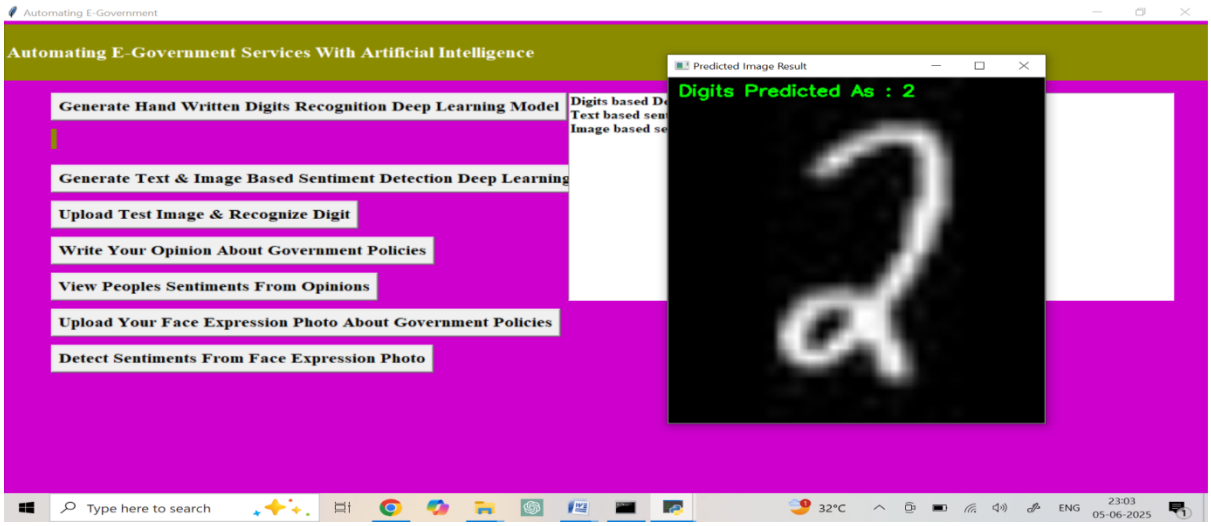
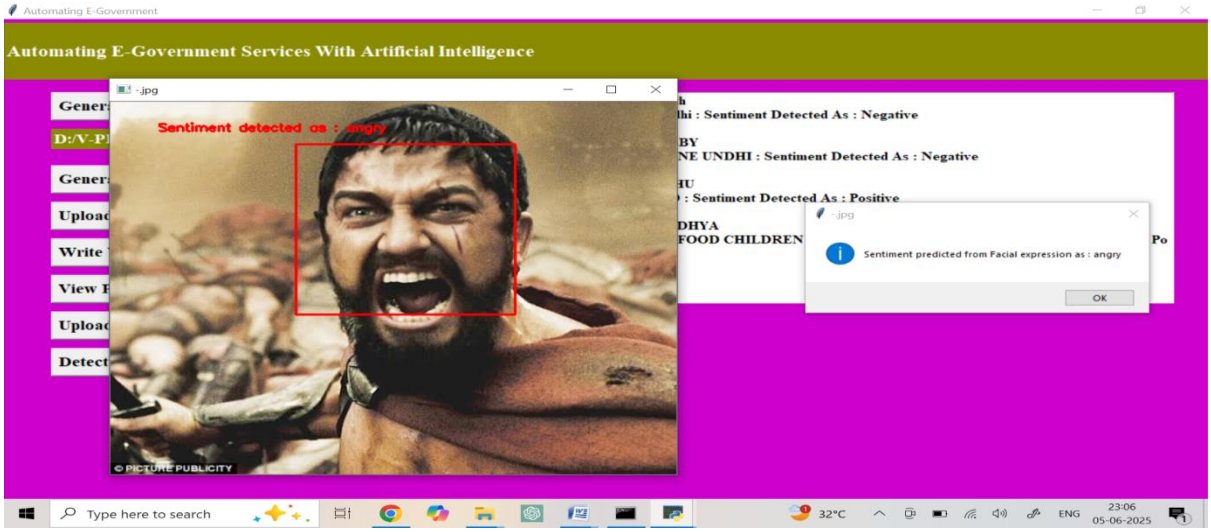
SCREEN SHOTS





CONCLUSION

With the recent advances in AI and deep learning technologies, more government agencies are starting to use such technologies to improve their systems and services. However, a large set of challenges hinder the adoption of such technologies, including the lack of experts, computational resources, trust, and AI interpretability.

In this paper, we introduced the definitions of artificial intelligence and e-government, briey discussed the current state of e-government indices around the world, and then proposed our solutions to advance the current state of e-government, considering the Gulf Countries as a case study. We proposed a framework for management of government information resources that help manage the e-government lifecycle end-to-end. Then, we proposed a set of deep learning techniques that can help facilitate and automate several e-government services. After that, we proposed a smart platform for AI development and implementation in e-government.

The overarching goal of this paper is to introduce new frameworks and platform to integrate recent advances in AI techniques in the e-government systems and services to improve the overall trust, transparency, and eficiency of e-government.

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