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ARTIFICIAL INTELLIGENCE-BASED AUTOMATION OF E-GOVERNMENT SERVICES

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Abstract

In a rising variety of fields, artificial intelligence (AI) has recently improved state-of-the-art outcomes. However there are still a number of issues that prevent its use in e-government applications, both for enhancing e-government systems and e-government-citizen interactions. In this article, we discuss the issues with e-government systems and suggest a paradigm for automating and facilitating e-government functions. We present a framework specifically for the management of e-government information resources. In the second step, we create a collection of deep learning models with the goal of automating various e-government services. Finally, we suggest an intelligent e-government platform architecture that enables the creation and execution of AI e-government applications. In order to advance the existing state of e-government services and decrease processing times, costs, and citizen happiness, our overall goal is to employ reliable AI techniques.

1 Introduction

Artificial intelligence (AI) has existed for a while in a variety of theoretical configurations and intricate systems, Yet, only recent developments in processing capability and huge data have made it possible for AI to produce excellent outcomes in an expanding number of domains. For instance, AI has made significant progress in a number of fields, including computer vision [1], medical applications [2], natural language processing [3], reinforcement learning [4], and others. The ability of a computer to mimic the intelligence of human behaviour

while enhancing its own performance is known as artificial intelligence (AI). In contrast to robotics, AI refers to an autonomous machine's intelligent behaviour, which characterises the machine's mind rather than its body, It has the ability to play video games, operate a car, and carry out many complex tasks. In addition to Machine Learning [5], Deep Learning [6], Natural Language Processing [3], Context Awareness [7], and Data Security and Privacy [8], AI is a field that lies at the intersections of many other fields. The intersections and connections between the AI field and related fields are shown in Figure 1.

Machine learning (ML) refers to an algorithm's capacity to gain knowledge from the past in order to develop intelligent behaviour and reach the right conclusions in a variety of situations that it

has never encountered before. The process of exposing an algorithm to a sizable dataset (such as the demographics of citizens) in order to predict future behaviours (such as employment rates) is known as training a computational model. Supervised learning is the process of learning from historical datasets.

Deep Learning, a branch of machine learning, has arisen to address the shortcomings of earlier ML algorithms, in contrast to regular ML methods. Deep learning can be defined as a mapping function that converts unprocessed input data (such as a medical image) into the intended output (such as a diagnosis) by minimising a loss function with an optimization method like stochastic gradient descent (SGD) [9]. In order to map the raw input data (inserted at the input layer) to the desired output (produced at the output layer) through a large number of layers (known as hidden layers), deep learning algorithms—inspired by the neural networks in the human brain—are built with a large number of hierarchical artificial neural networks. The actual mapping process, which consists of a succession of straightforward but nonlinear mathematical operations (i.e., a dot product followed by a nonlinear process), is carried out by the hidden layers. Deep learning's key benefit is that it eliminates the need for feature engineering.

Although deep learning has improved state-of-the-art outcomes in a number of fields, it is nevertheless obvious that e-government applications encounter a number of difficulties when implementing deep learning [10]. First off, it is getting harder to find deep learning experts that can create efficient and dependable AI applications, especially in developing nations, given the recent and quick advancements in this field. Second, a whole set of development obstacles have been added by the lifecycle of AI projects, particularly deep learning. Traditional software development, in particular, concentrates on fulfilling a number of necessary functional and non-functional requirements, In practise, deep learning development focuses on the unsystematic search-based optimization of a certain metric based on a huge number of parameters. Third, robust policies and controls on data security and privacy are necessary for integrating AI and deep learning technologies in e-government services. The development of specific guidelines for data security and privacy is still hampered by issues with citizen-government trust, transparency, and other technological difficulties associated with creating and operating secure systems.

2 Existing System

Many nations have recently adopted e-government services across multiple ministries and apps. Although though many studies have been done to improve e-government services, very few of them speak to using new developments in AI and deep learning in the automation of e-government services. Thus, there is still a pressing need to handle e-government needs and issues using cutting-edge AI approaches and algorithms. Nonetheless, there are still a number of difficulties in deploying e-government applications, including the following: Online service quality, public confidence in the government, and individual beliefs are all important aspects that influence people's willingness to trust them. Absence of expertise: Putting high-quality online services into place necessitates the formation of the ideal team of professionals that spans all relevant practise areas, from web development to security and privacy. Accessibility: Some developing nations still have serious problems in gaining access to the internet and its services. Modern security measures

are necessary to protect both the privacy of citizens using e-Government services.

3 Proposed System

In this study, the author presents a notion for using Artificial Intelligence (AI) tools, such as the Deep Learning Convolution Neural Networks algorithm, to automate government functions (CNN). People can read news and notices about new government initiatives on the internet, and they can subsequently express their opinions about these initiatives in writing, which can assist the government in making better judgements. We need software that functions like human brains that can readily understand if people's opinions are positive or negative in order to automatically discover public opinion about plans. Developing a CNN model that can function like a human brain in order to develop such automatic opinion detection. In order to achieve such automatic opinion identification, the author advises using a CNN model that can operate similarly to the human brain. Any service can produce this CNN model, and we can programme it to function like automated decision-making without involving any human beings. 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. We included yet another model in our extension model that can recognise emotion from a person's face. Persons' facial expressions can convey feelings more effectively than words or sentences. Hence, our extension work may infer emotions from photos of a person's face.

4 Implementation

Recognize handwritten digits in a database. Deep Learning Model: With this model, we are developing a CNN-based handwritten model that predicts the name of a digit from its image. In order to create a CNN model, two different sorts of images must be used: train images, which contain every possible combination of digit shapes a person could possibly write, and test images, which are used to determine whether the CNN model is improving prediction accuracy. CNN will create the training model using all of the train photos. We will first extract features from train photos before developing a model. Also, as part of the testing process, we will take the test image's attributes and apply a train model to it in order to categorise it.

Create Text- and Image-Based Sentiment Analysis Deep Learning Model: With this module, we will create a sentiment detection model based on text and images. To create a text-based sentiment model, every positive and negative term will be used. The creation of an image-based sentiment model will make use of a wide variety of facial expression photographs. Every time we input text or an image, the train model is used to forecast the sentiments of that input. With this module, we will submit a test image and apply a trained model to recognise digits.

Write Your Opinion Regarding Government Policies: We will accept user opinions using this module and then save them inside the programme so that we can identify the sentiment behind them.

See People's Sentiments From Opinions: With the help of this module, users can view all user opinions as well as feelings that the CNN model has identified.

Submit a picture of your face showing how you feel about government policies. With this module, the user will upload a picture of their face showing how they feel about the plan.

Detect Sentiments From Facial Expression Photos: By using this module, users can view facial expression photos and the determined sentiment that previous users have uploaded.

5 Conclusion

Many government organisations are beginning to adopt AI and deep learning technology to enhance their systems and services as a result of recent advancements in these fields. The deployment of such technologies is, however, hampered by a wide range of issues, such as a lack of specialists, computational resources, trust, and AI interpretability.

Using the Gulf Countries as a case study, we suggested our suggestions to improve the existing status of egovernment after defining artificial intelligence and e-government, discussing the global e-government indexes, and introducing the concepts. We put out a methodology for managing government information resources that aids in managing the entire lifespan of e-goveThen, we suggested a collection of deep learning methods that may assist with and automate a number of e-government functions.

After that, we suggested a clever platform for the creation and application of AI in e-government.

In order to increase the overall trust, transparency, and efficiency of e-government, this paper's main objective is to propose new frameworks and platforms for integrating current breakthroughs in AI approaches into e-government systems and services.

6 References

[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.

[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.

[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

[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.

[5] C. Bishop, Pattern Recognition and Machine Learning. New York, NY, USA: Springer, 2006.

[6] Y. LeCun, Y. Bengio, and G. Hinton, “Deep learning," Nature, vol. 521, no. 7553, pp. 436_444, 2015.

[7] G. D. Abowd, A. K. Dey, P. J. Brown, N. Davies, M. Smith, and P. Steggles, “Towards a better understanding of context and contextawareness," in Proc. Int. Symp. Handheld Ubiquitous Comput. Berlin, Germany: Springer, 1999, pp. 304_307.

[8] C. Dwork, ``Differential privacy," in Encyclopedia of Cryptography and Security, H. C. A. van Tilborg and S. Jajodia, Eds. Boston, MA, USA: Springer, 2011.

[9] L. Bottou, ``Large-scale machine learning with stochastic gradient descent," in Proc. COMPSTAT, 2010, pp. 177_186.

[10] A. Kankanhalli, Y. Charalabidis, and S. Mellouli, ``IoT and AI for smart government: A research agenda," Government Inf. Quart., vol. 36, no. 2,pp. 304_309, 2019.

[11] J. B. Lee and G. A. Porumbescu, "Engendering inclusive e-government use through citizen IT training programs," Government Inf. Quart., vol. 36, no. 1, pp. 69_76, 2019.

[12] R. Santa, J. B. MacDonald, and M. Ferrer, ``The role of trust in e-Government effectiveness, operational effectiveness and user satisfaction: Lessons from Saudi Arabia in eG2B," Government Inf. Quart., vol. 36, no. 1, pp. 39_50, 2019.

[13] J. D. Twizeyimana and A. Andersson, "The public value of E-Government_A literature review," Government Inf. Quart., vol. 36, no. 2, pp. 167_178, 2019.

[14] M. Güler, E. Mukul, and G. Büyüközkan, "Analysis of e-government strategies with hesitant fuzzy linguistic multi-criteria decision making techniques," in Proc. Int. Conf. Intell. Fuzzy Syst. Cham, Switzerland: Springer, 2019, pp. 1068_1075.

[15] P. G. Nixon, V. N. Koutrakou, and R. Rawal, eds. Understanding E- Government in Europe: Issues and Challenges. Evanston, IL, USA: Routledge, 2010.

[16] D. A. D. Putra, K. A. Jasmi, B. Basiron, M. Huda, A. Maseleno, K. Shankar, and N. Aminudin, ``Tactical steps for e-government development," Int. J. Pure Appl. Math., vol. 119, no. 15, pp. 2251_2258, 2018.

[17] A. T.-K. Ho, ``Reinventing local governments and the e-government initiative," Public Admin. Rev., vol. 62, no. 4, pp. 434_444, 2002.

[18] M. Yildiz, ``E-government research: Reviewing the literature, limitations, and ways forward," Government Inf. Quart., vol. 24, no. 3, pp. 646_665, 2007.

[19] H. J. Scholl, E-Government: Information, Technology, and Transformation. Evanston, IL, USA: Routledge, 2015.

[20] United Nation E-Government Survey. Accessed: Jul. 2019. [Online]. Available: https://publicadministration.un.org/egovkb/enus/Reports/UNEGovernment-Survey-2018