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AUTOMATING E- GOVERNMENT SERVICES WITH ARTIFICIAL INTELLIGENCE

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Abstract : The use of artificial intelligence (AI) have lately improved state-of-the-art results in a wide range of sectors. To improve both the systems and citizen-government interactions, it still faces a number of challenges that hinder its adoption in e-government applications. We address the issues with e-government systems in this article and propose an approach for automating and streamlining e-government services. .. Introduce an arrangement for the management on information assets for e-government first to be more exact. A series of deep learning models are created in the second step with the intention of automation various e-government services. Third, we propose a platform architecture for intelligent e-government that supports the development and operation of AI electronic government applications. Our overarching objective is to use trustworthy AI methods to improve the current state of e-government offerings and reduce time to processing, costs, and public satisfaction.

Keywords **- E-Government, Artificial intelligence, Machine learning, Deep learning model**

1.INTRODUCTION

The concept of AI has been around for a while in a variety of theoretical forms and complex systems, but it has only recently been made possible by breakthroughs in computing power and massive data to achieve spectacular outcomes in an expanding range of disciplines. For instance, AI has made significant progress in computer vision. [1], applications in medicine [2], NLP [3], learning through reinforcement [4], and various more fields. The capacity of a computer to mimic the intelligence of people while enhancing its own performance is known as artificial intelligence (AI). AI, which is not just robotics but rather the intelligent actions of an autonomous device that characterizes the machine's mind rather than its body, is capable of playing video games, driving cars, and doing a variety of complex tasks. In addition to the areas of Machine Learning [5], supervised learning [6], the processing of natural languages [3], Contextual Understanding [7], and Data Privacy and Security

AI is a field that lies at the crossroads of many other fields. The intersections and connections between the AI field and related fields are shown in Figure 1. Machine learning (ML) is the ability of an algorithm to learn from its past experiences in order to create intelligent behavior and draw appropriate inferences in a variety of situations that it has never seen before. Training a mathematical framework is the process of subjecting an algorithm to a significant database (such as the demographic information of residents) in order to predict future actions (such as employment rates). A technique to acquire knowledge from historical data sets is supervised learning

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 function of mapping that converts unprocessed inputs (such as medical images) into desired outputs (such as diagnoses) by minimising a loss function using an optimization technique like stochastic gradient descend (SGD) [9]. Numerous hierarchical artificial neural networks are used to construct deep learning algorithms, which are modeled after neural networks found in the human brain. that 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), and thus the name deep learning. The hidden layers are responsible for the actual mapping process, which is a series of simple but nonlinear mathematical operations (i.e., a dot product followed by a nonlinear process). The main advantage of deep learning is that it does not require 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 trustworthy applications for artificial intelligence, especially in developing nations, given recent and quick advancements in this field. Second, a whole set of development obstacles have been added by the entire lifespan of AI projects, particularly deep learning

Traditional software development, in particular, concentrates on fulfilling a number of necessary functional and non-functional needs; in practice, machine learning innovation focuses on unsystematic search-based optimization of a certain measure based on a huge number of parameters. Third, robust policies and controls on privacy and security of data are necessary for embedding AI and deep learning technologies in e-government services. The development of specific guidelines for privacy and security of data is still hampered by issues with citizen and government confidence, openness, and other technological difficulties associated with creating and operating secure systems.

2. PROBLEM STATEMENT

By utilizing artificial intelligence (AI) technology, this initiative attempts to overcome the inefficiencies and absence of automation in e-government services. The issue is caused by lengthy processing times, intricate processes, and a lack of human resources, which leads to delays, mistakes, and citizen unhappiness. The project intends to streamline and maximize e-government services by applying AI-powered solutions, cutting processing times, streamlining processes, improving decision-making abilities, and offering a seamless user experience. Navigating bureaucratic intricacies, consolidating and harmonizing data, comprehending natural language, guaranteeing security and confidentiality, and providing citizen-centric services are among the difficulties. The objective is to turn e-government services into effective, automated, and citizen-centric platforms that raise the level of happiness and accessibility for citizens

3.EXISTING SYSTEM

Multiple nations have recently adopted e-government services across multiple ministries and apps. While many studies have been done to improve e-government services, very few of them speak to the use of contemporary developments in AI as well as deep intelligence in the automated provision of services provided by e-government. thus is still a pressing need to handle e-government needs and issues using cutting-edge AI approaches and algorithms. Implementing e-government applications, however, still faces a number of difficulties, such as the following. Trust: The degree to which users place their confidence in online services depends significantly on a number of variables, such as the degree to which users place their faith in the government as a whole, the caliber of the websites, and the users' own personal beliefs (for example, many users still prefer to submit paper applications over using web services). Lack of expertise: Putting high-quality online services into place necessitates the formation of the ideal team of professionals that spans all relevant practice areas, from developing websites to privacy and security. Accessibility: Several developing nations still have serious problems in gaining access to the World Wide Web and its services. Modern security measures are necessary to protect both the privacy of citizens using e-government applications.

3.1 DEMERITS OF THE EXISTING SYSTEM

The current e-government service delivery system has a number of drawbacks, such as lengthy processing times, intricate processes, a lack of human resources, inconsistent service delivery, restricted availability, data redundancy and dispersion, a lack of individualization, and inadequate user support. Delays, muddle, mistakes, unequal access, and a poor user experience for people are the results of these problems. These drawbacks may be resolved by automating processes and utilizing AI technologies, which will result in more efficient data management, quicker processing, streamlined procedures, increased consistency, improved accessibility, and complete user assistance. E-government services would become more effective, user-friendly platforms that better meet the requirements and expectations of citizens with such enhancements.

4. METHODOLOGY

4.1 PROPOSED SYSTEM

In this paper author describing concept toautomate government services with Artificial Intelligence technology such as Deep Learning algorithm called Convolution Neural Networks (CNN). Government can introduce new schemeson 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 softwarelike 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 suggestingto build CNN model which can work like humanbrains. 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 authoralready 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 weadded anothermodel which can detect sentiment from person face image. Person face expressions can describe sentiments better than words or sentences. So our extension work can predictsentiments from person face images.

4.2 MERITS OF THE PROPOSED SYSTEM

The proposed system of automating e-government services with artificial intelligence (AI) offers numerous merits, including reduced processing times, simplified procedures, optimized resource utilization, consistent service delivery, improved accessibility, and enhanced data management. By leveraging AI technologies, government services can be processed faster, procedures can be simplified for easier citizen navigation, and limited human resources can be better utilized. The system ensures consistent and fair service delivery, enhances accessibility for all citizens, and improves data integration and analysis. Overall, the proposed system transforms e-government services into efficient, user-friendly platforms that promote trust, satisfaction, and effective governance.

5. PROPOSED METHODOLOGY

5.1 SYSTEM ARCHITECTURE

Even while there are a ton of a digital government data and resources that might be used in a huge variety of applications, they aren't being used in a way that makes it easier and more advanced for present-day e-government services to use data-driven techniques. The existing level of digital government systems and services can be considerably improved to become more effective and economical by utilizing cutting-edge deep learning algorithms. Various deep neural network models that aim to automate various e-government services are introduced in this section. We developed the models to produce highly accurate results in Arabic to enable e-government platforms in Arabic-speaking nations. We specifically created neural network models for the classification of face sentiment, handwritten digit recognition, and handwritten letter recognition. Each of our developed models can be used for automating the current systems in a variety of services. But first, we provide the reader a brief introduction to deep learning and its principles before presenting the models..

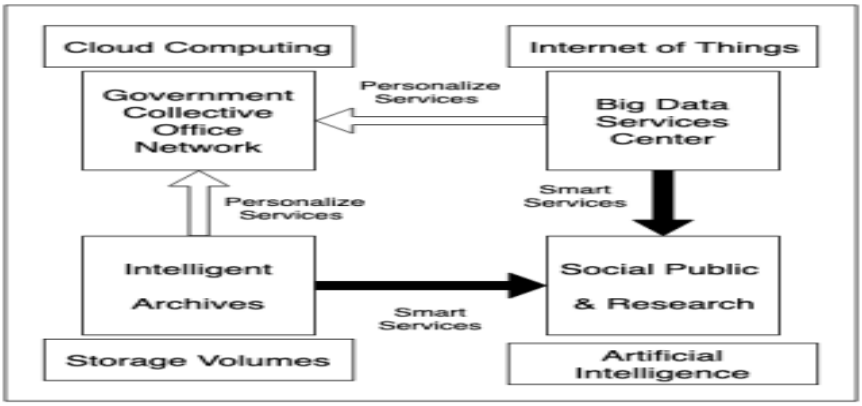

Fig1: An architecture overview for a centralized e-government information management framework.

5.2 CONVOLUTIONAL NEURAL NETWORK

Following pre-processing, CNN is utilized for training, and we then have a trained model. Tensor flow was used to assist write the CNN method. We categorize the image that the system receives following pre-processing of the test image using this model. Then, a specific disease name—or a healthy leaf name, when there is no illness on that leaf—is sent to an Android application. With the assistance of that disease name, the application then provides a specific pesticide name, enabling the farmer to take the necessary action to reduce the percentage of disease.

CNN image classifications takes an input image, process it and classify it under certain categories (Eg., Dog, Cat, Tiger, Lion). Computers sees an input image as array of pixels and it depends on the image resolution. Based on the image resolution, it will see h x w x d(h = Height, w = Width, d = Dimension). Eg., An image of 6 x 6 x 3 array of matrix of RGB (3 refers to RGB values) and an image of 4 x 4 x 1 array of matrix of grayscale image.

Technically, deep learning CNN models to train and test, each input image will pass it through a series of convolution layers with filters (Kernals), Pooling, fully connected layers (FC) and apply Softmax function to classify an object with probabilistic values between 0 and 1. The below figure is a complete flow of CNN to process an input image and classifies the objects based on values.

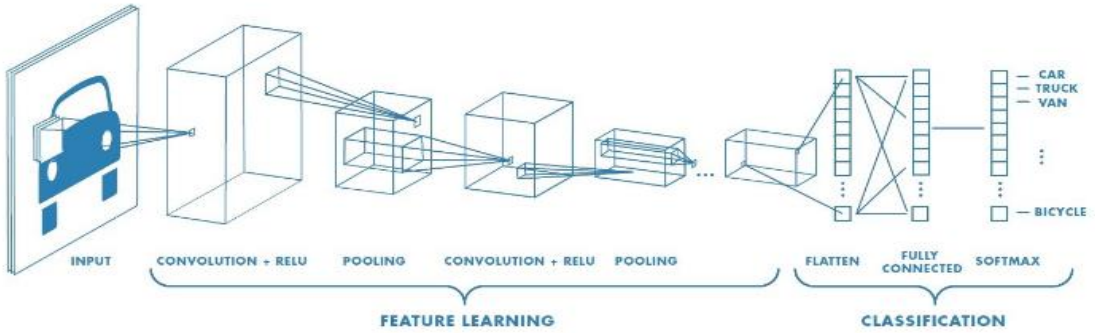

Figure 2 : Neural network with many convolutional layers

6. IMPLEMENTATIONUSER:

Generate Hand Written Digits Recognition DeepLearning Model: using this model we arebuilding 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 testedwhether 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 builda model. While testing also we will extract features from test image and then apply train model on that test image to classify it.

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 generateimage based sentiment model. Whenever we input text or image then train model will be applied on that input to predict its sentiments.

Upload Test Image & Recognize Digit: By usingthis module we will upload text image and applytrain model to recognize digit.

Write Your Opinion About Government Policies: using this module we will accept user'sopinion and then save that opinion insideapplication to detect sentiment from opinion.

View Peoples Sentiments From Opinions: using this module user can see all users opinion and their sentiments detected through CNN model.

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 thefacial expression image and detected sentiment which is uploaded by past users

7. RESULTS

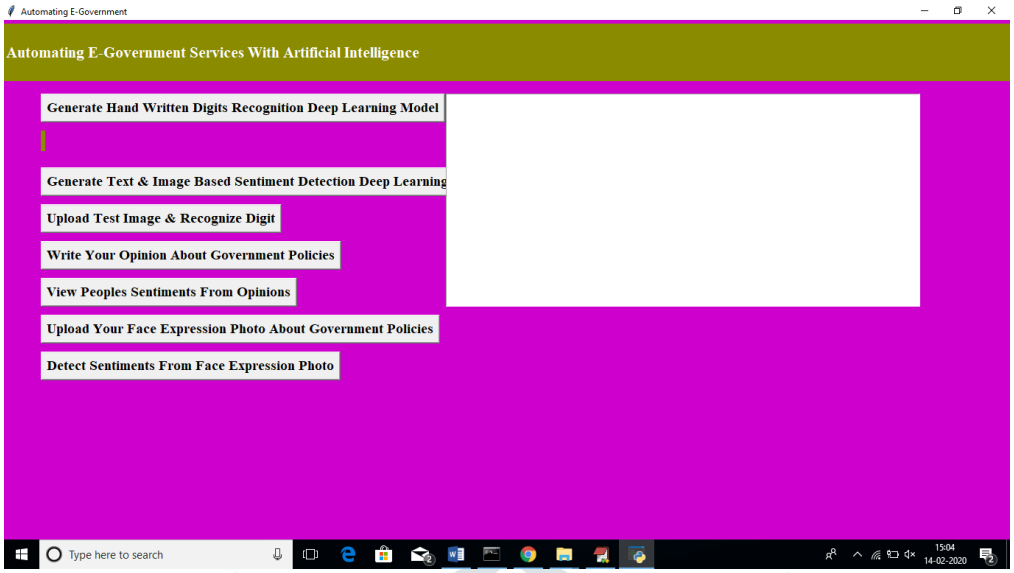

FIGURE 3: HOME PAGE

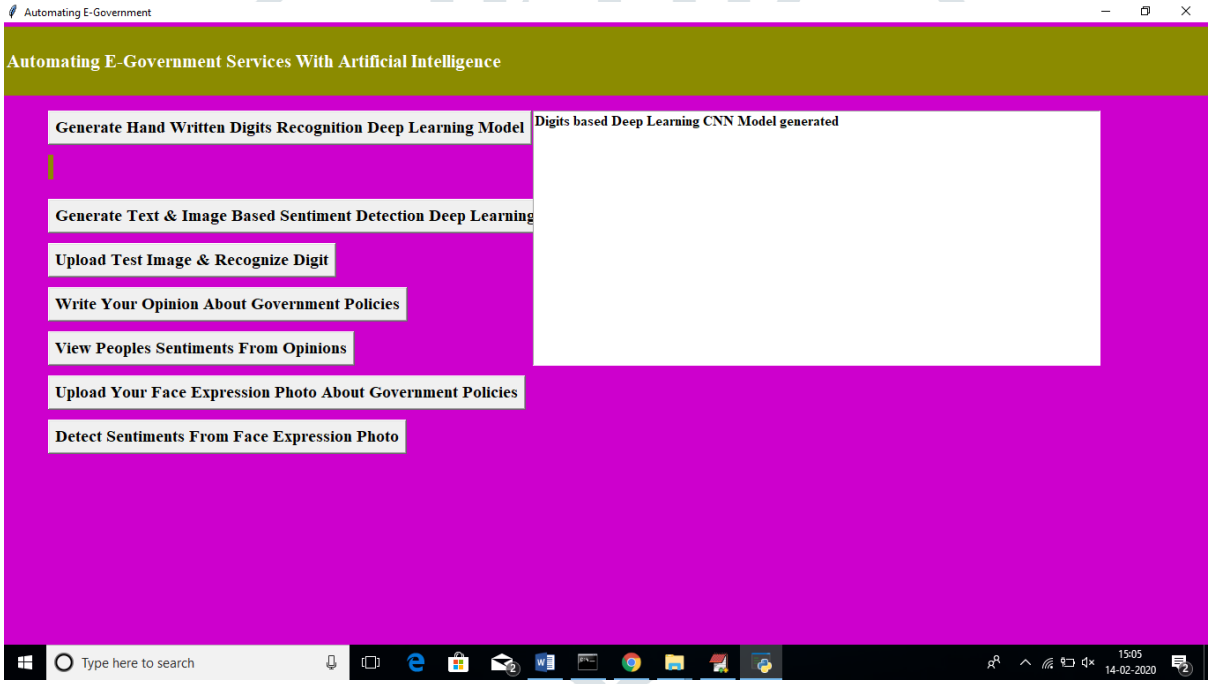

FIGURE 4: DIGITS MODEL GENERATED AND CNN LAYER

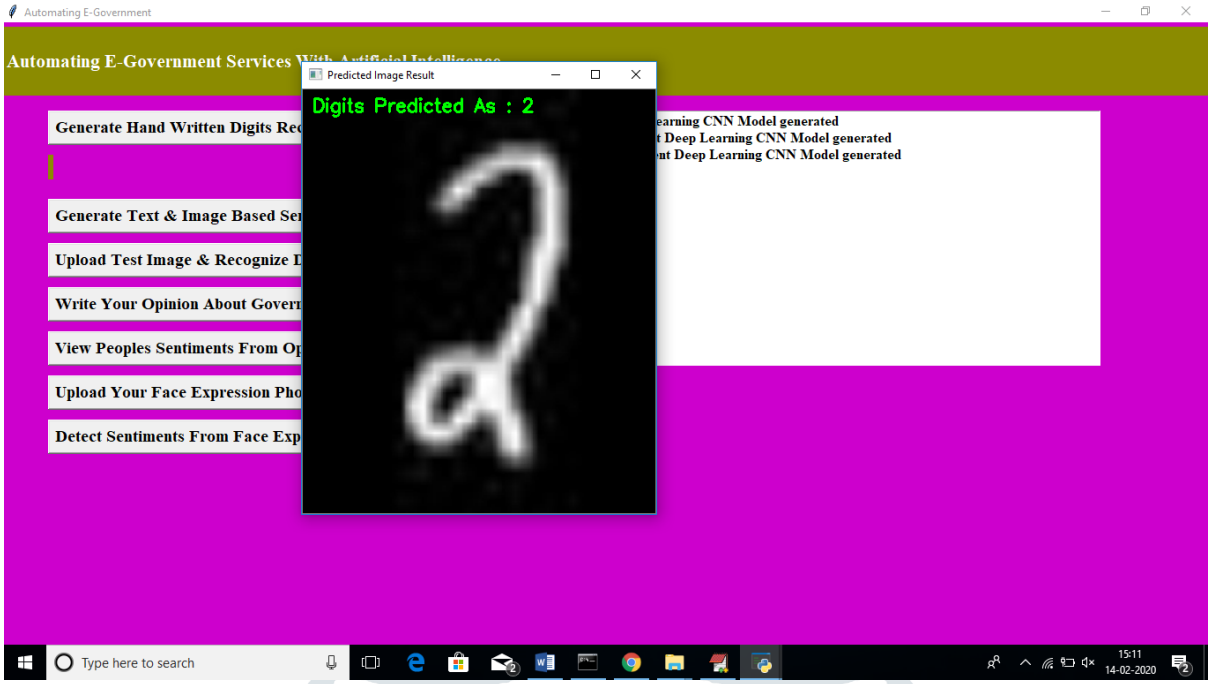

FIGURE 5: DIGITS 2 IS PREDICTED

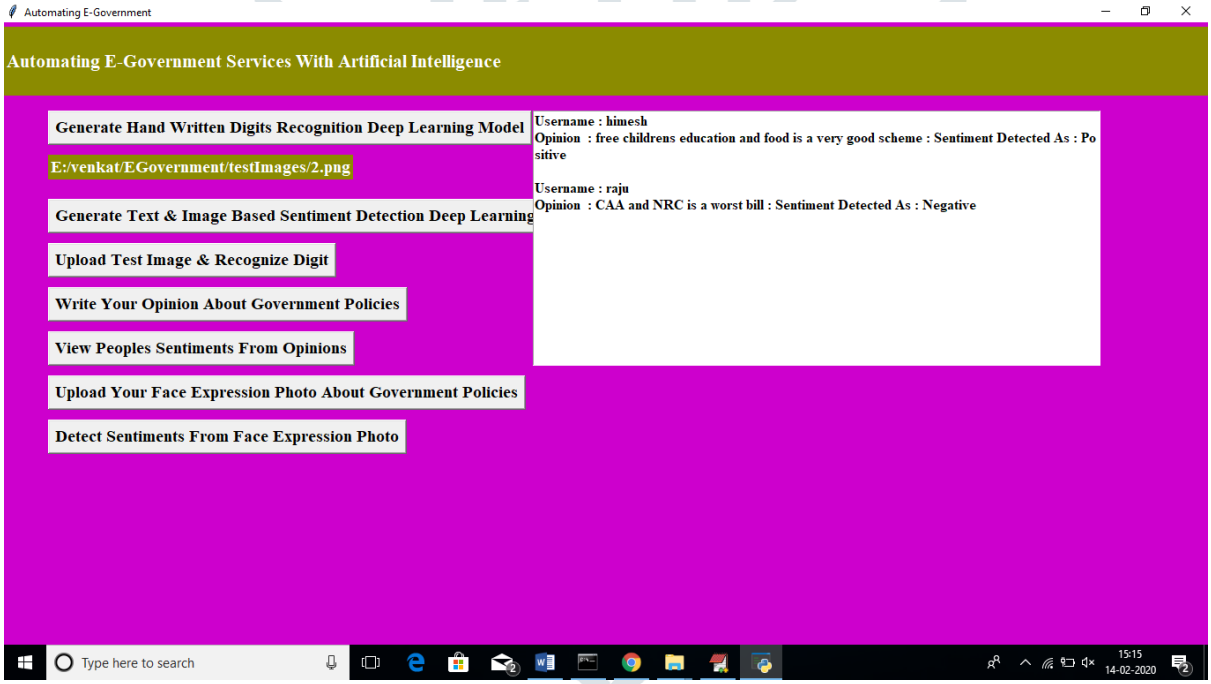

FIGURE 6: REVIEWS IS DISPALYED WITH USERNAME

In above screen text area we can see opinions from all users and in first opinion we got sentiment detected as positive which means user is satisfy with that scheme and for second opinion we got sentiment as negative which means user not happy. Similarly user can upload their image with facial expression which describe whether user is happy or angry

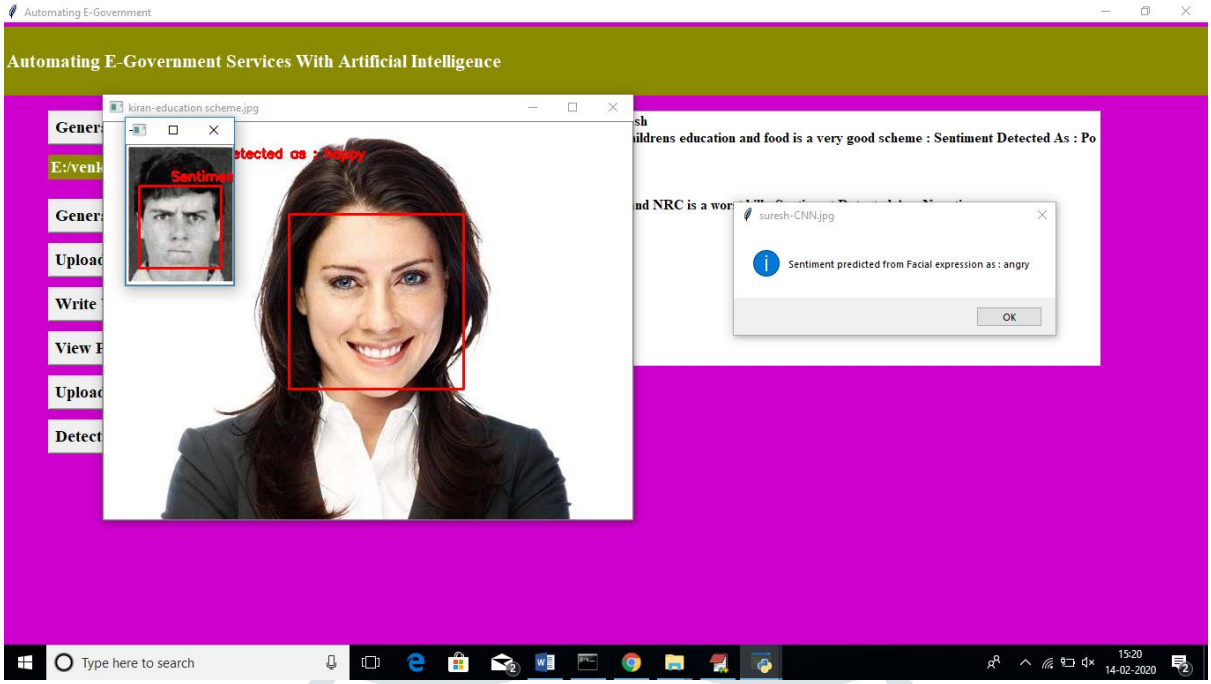

Figure 7: Facial Expression Are Identified With Their Sentiments

In above screen we can see all images with facial expression are identified with their sentiments. In dialog box also we can see sentiment result. Similarly you can enter any number of comments or facial images to detect their sentiments

8. CONCLUSION

More government organizations are beginning to adopt AI as well as deep learning technology to enhance their services and systems as a result of recent advancements in these fields. The deployment of these technologies is, however, hampered by a wide range of issues, such as a lack of specialists, computational capacity, trust, and AI comprehension. Using the Gulf States as a case study, we suggested our suggestions to improve the existing status of e-government after defining AI and e-government, discussing the global e-government indexes, and introducing the concepts. We put out a paradigm for managing government information assets that aids in managing the entire lifespan of e-government. Then, 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 confidence, openness, and efficiency of e-government, this paper's main objective is to propose new frameworks and platforms to integrate current breakthroughs in AI approaches into the systems and services

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 neuralnetwork 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, ``Deeplearning," 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 context- awareness," 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 learningwith 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 e-G2B," 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 inEurope: 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 localgovernments 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 Transforma-tion. Evanston, IL, USA: Routledge, 2015.

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