ARTIFICIAL INTELLIGENCE-BASED E-GOVERNMENT SERVICE AUTOMATING

[1] K. LAKSHMI, [2] Dr. N. PENCHALIAH,
[3]K. SARATH BABU, [4] G. CHANDRA SEKHAR
[1234], Department of Computer Science Engineering, AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY, NH-16, By-Pass Road, Gudur, Tirupati Dist, Andhra Pradesh, -524101, India.

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 project, we address the challenges of e- government systems and propose a framework that utilizes AI technologies to automate and facilitate e-government services. Specifically, we first 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.

Index terms— Artificial Intelligence, Machine Learning, E-government.

I. INTRODUCTION

Artificial 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 field 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].

II. LITERATURE SURVEY

Deep residual learning for image recognition

Deeper neural networks are more difficult to train. We present a residual learning framework to ease the training of networks that are substantially deeper than those used previously. We explicitly reformulate the layers as learning residual functions with reference to the layer inputs, instead of learning unreferenced functions. We provide comprehensive empirical evidence showing that these residual networks are easier to optimize, and can gain accuracy from considerably increased depth. On the Image Net dataset, we evaluate residual nets with a depth of up to 152 layers - 8× deeper than VGG nets [40] but still having lower complexity. An ensemble of these residual nets achieves 3.57% error on the Image Net test set. This result

won the 1st place on the ILSVRC 2015 classification task. We also present analysis on CIFAR-10 with 100 and 1000 layers. The depth of representations is of central importance for many visual recognition tasks. Solely due to our extremely deep representations, we obtain a 28% relative improvement on the COCO object detection dataset. Deep residual nets are foundations of our submissions to ILSVRC & COCO 2015 competitions1, where we also won the 1st places on the tasks of Image Net detection, Image Net localization, COCO detection, and COCO segmentation.

Analysis of e-government strategies with hesitant fuzzy linguistic multi-criteria decision-making techniques

In recent years, e-Government policies have undergone significant changes throughout the global digital transformation. e-Government can be defined as the online delivery of government information and services through the Internet or other digital means. Diversely, e-Government is more than a new channel of delivering services for governments since it provides transparency and efficiency of administration. In 2011, two significant e-government strategy documents were prepared in Turkey. The aim of this study is twofold. First, we aim to provide an analytical tool prioritizing e-Government success factors. Second, we aim to rank e-Government strategies proposed by Turkey's ministries. For addressing these problems, Hesitant Fuzzy Linguistic (HFL) Multi-Criteria Decision Making (MCDM) technique is used. MCDM technique is applied to consider multiple success factors. Hesitant Fuzzy Linguistic Term Sets (HFLTS) technique is implemented to represent decision makers' (DMs') preferences in complex circumstances such as uncertainty in DMs' evaluations and the difficulty about expressing thoughts by numerical values. An application about eGovernment adoption in Turkey is provided to illustrate the potential of the proposed technique.

III. PROPOSED SYSTEM

The overview of our proposed system is shown in the below figure.

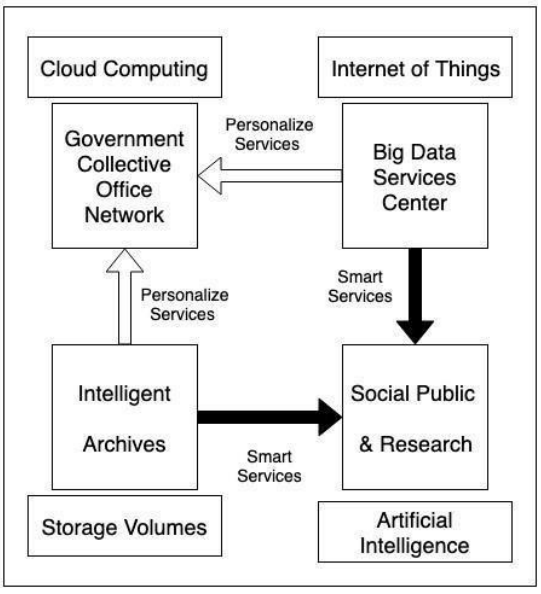

Fig-1: System Overview

Implementation Modules

- 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.
- 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
- Upload Test Image & Recognize Digit: By using this module we will upload text image and apply train model to recognize digit.
- 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.
- 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

Implementation Algorithms

- CNN
- In deep learning, a convolutional neural network (CNN, or ConvNet) is a class of artificial neural network (ANN), most commonly applied to analyze visual imagery. CNNs are also known as Shift Invariant, based on the shared-weight architecture of the convolution kernels or filters that slide along input features and provide translation-equivariant responses known as feature maps.

IV. RESULTS

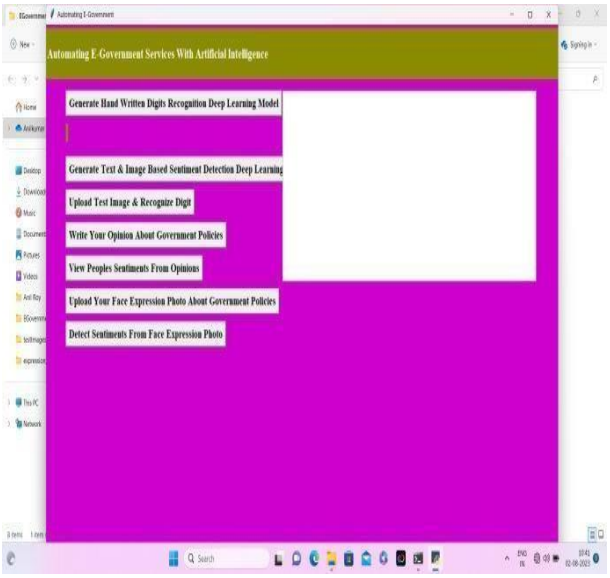

Fig-2: Home Page

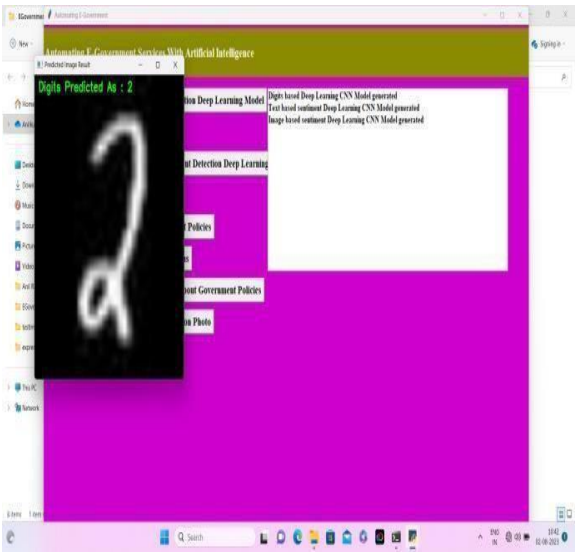

Fig-3: Test Image recognition

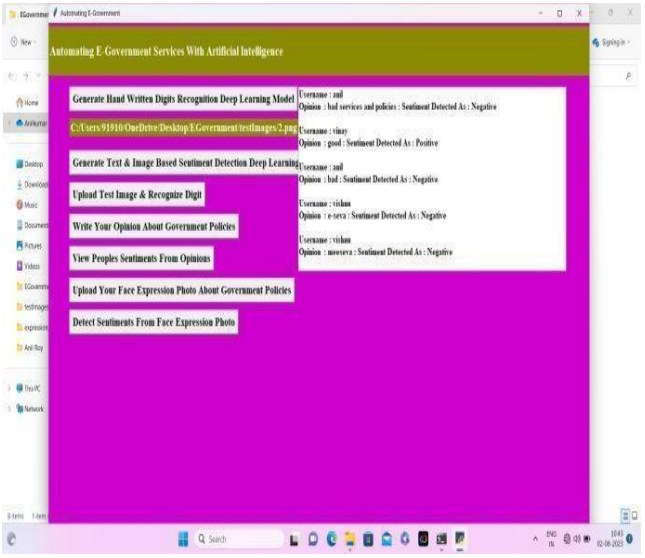

Fig-4: Results

V. 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, briefly 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 efficiency of e-government.

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