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The Integration of Artificial Intelligence on E-Governence and Cybersecurity in Smart Cities

[1]Mrs.N.Sujata Kumari, [2]G.Laxmiprasanna, [3]B.Sharanya, [4]V.Anusha

[1]Associate Professor, Department of Computer Science and Engineering, Sridevi Women's Engineering College, Hyderabad, India.
Email: nsujata02@gmail.com,

[2,3,4,]B.Tech Student, Department of Computer Science and Engineering, Sridevi Women's Engineering College, Hyderabad, India.

ABSTRACT

One of the most important technologies of the Fourth Industrial Revolution (Industry4.0) is artificial intelligence (AI), which will help keep computer networks safe from things like hacking, viruses, phishing, and other forms of cyber criminality. The use of artificial intelligence (AI) in e-Government has the ability to improve cyber capabilities and security for non-state enterprises, nation-states, and local governments. Current studies provide a mixed picture of the interaction between AI, eGovernance, and cybersecurity; nevertheless, it is thought that this picture is situational. Several parties with different backgrounds and levels of experience have an impact on and effect on artificial intelligence (AI), electronic governance (e-Government), and cybersecurity (Cybersecurity). This research probes the interplay of cybersecurity, e-Governance, and artificial intelligence in an effort to close this situational knowledge gap. Additionally, this research looks at how e-Governance mediates the connection between AI and cybersecurity, as well as how stakeholders' engagement modifies that link. An examination of PLS-SEM route models linking AI and cybersecurity found that eGovernance somewhat mediated the relationship. Also, the correlation between cybersecurity and eGovernance and AI and e-Governance were also shown to be moderated by the engagement of stakeholders. Involvement of stakeholders is crucial in AI and e-Governance, since all parties involved want a safe, open, and dynamic cyberspace where they may utilise e-services. It is clear from this research that smart city governments need to take action to improve their cybersecurity measures.

INTRODUCTION:

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network from possible dangers is an essential part of cybersecurity, which has grown into an important and crucial field. Hackers intentionally target computer networks, data, programmers, and electronic information in order to incite violence against non-combatant opponents. It is necessary to come up with new ways to avoid cyber risks as they evolve in Nowadays, safeguarding the computer

tandem with technology. Allegedly, cyberattacks have become increasingly common in the industrial sector, leading to substantial financial loss and severe damage to infrastructure. The increasing dependence on internet technologies that permit the storing of financial and personal data is the main reason why cyber-attacks against organizations are on the increase. Since it causes financial harm and leaks private information, it is therefore seen as perhaps the most pressing issue in the current setting. Any member of society is vulnerable to cyber attacks such as phishing, DoS, malware, and ransom ware outbreaks. The psychological toll of cyberattacks is substantial, with many reporting feelings of depression, anxiety, and stress as a result. The use of AI has the potential to improve cyber capabilities and national security for both sovereign nations and regional and non-state organizations. AI is an effective method for reducing The IEEE Access journal has approved this piece for

 9 consequences of cyberattacks. Autonomous machines that perform tasks associated with intelligence are known as artificial intelligence (AI) [11]. Strategic planning and decision-making include the knowledge and experience of human experts, including those who make medical diagnosis and who draw on their knowledge to draw conclusions. Zarina et al. demonstrated that AI has both positive and negative consequences on cybersecurity; one negative consequence is that it makes cyberattacks easier to launch, leading to more rapid and catastrophic assaults. By enhancing security measures and fostering cyberspace security, AI has the promise of substantially enhancing cybersecurity in the future. In addition, AI has improved machine learning applications for malware categorization and networked intrusion detection, and it helps security professionals recognize indicators of cyber hazards. Finally, cutting-edge AI has revolutionized smart city defenses by enhancing their ability to ward off foreign assaults and other major security risks. The management of a city might benefit from a smart city since it offers several creative solutions to various problems. E-Government relies heavily on information and communication technology (ICT), however. There are new risks and challenges that come with integrating ICT into a city's infrastructure. In order to access digital services like ebanking and email, many people utilise unsecured Wi-Fi networks, leaving themselves vulnerable to cybercrimes including hacking, denials of service, and cracking. One of the most significant ways to classify safe cities throughout the world is by their cybersecurity measures, which include the use of technology to safeguard eGovernment services. The 'inclusive smart city' framework has garnered a lot of attention within this trend since it places a premium on social and interpersonal capital in city-wide efforts to include stakeholders in the digital realm and to include residents in service improvement in order to provide citizens with government services that are tailored to their needs. A citizens-centered approach to smart cities is projected to foster robust social ecologies that rely heavily on web technology, according to recent research on eservices and technologies. As a result, stakeholder

engagement may be greatly influenced by online offerings.

Cybersecurity has largely gone unnoticed, particularly in relation to stakeholders that use online government services. This is despite the fact that prior research has shown that AI has an impact on smart mobility, energy management, public services, climate change, and smart city security.

RELATED WORK:

Recurrent Neural Networks for Picture Identification

It takes more time and effort to train deeper neural networks. We provide a residual learning framework that streamlines the training of much deeper networks compared to earlier methods. Rather than learning unreferenced functions, we recast the layers as learning residual functions that are referenced to the layer inputs. We provide extensive empirical data demonstrating that these residual networks are amenable to optimization and can improve accuracy with much more depth. We assess residual nets on the ImageNet dataset that have as much as 152 layers, which is 8 times deeper than VGG nets [40] but still less complicated. The ImageNet test set shows an accuracy of 3.57% when these residual nets are used in an ensemble. When the ILSVRC 2015 classification job was run, this result came out on top. Additional study on CIFAR-10 with 100 and 1000 layers is also presented. For many visual identification tasks, the depth of representations is crucial. An impressive 28% relative increase on the COCO object identification dataset is achieved only by means of our very deep representations. Our entries to the ILSVRC and COCO 2015 competitions1 were built on top of each other and used deep residual nets. We also took first place on the ImageNet detection, ImageNet localization, COCO detection, and COCO segmentation tasks.

Machine Learning-Based Video-toNatural-Language Translation .

It has long been an objective of AI to find a solution to the visual symbol grounding issue. New developments in deep learning for image-based natural language processing suggest that the area is getting closer to this target. Our proposal in this study is to use a combined convolutional and recurrent deep neural network to directly convert films to text. Existing approaches have mostly been used on toy domains with a limited vocabulary of words, and described video datasets are uncommon. Our technique can generate sentence descriptions of open-domain films using huge vocabularies by transferring information from over 1.2 million pictures with category labels and over 100,000 photos with captions. We evaluate our method in comparison to newer studies that

have used metrics for language creation, accuracy in predicting subjects, verbs, and objects, and human reviewers.

Gong mastery via the use of DLNs and tree search

Many consider Go to be the most difficult traditional game for AI to tackle because of the vast search area it presents and the difficulty of assessing board situations and movements. 'Value networks' are used to assess board situations and 'policy networks' are used to choose moves in this novel computer Go strategy. The unique training method for these deep neural networks combines supervised learning with reinforcement learning derived from self-play games with human expert games. Neural networks use cutting-edge Monte Carlo tree search algorithms to mimic thousands of self-playing random games and play Go at a level comparable to that of these programmed, all without using look ahead search. In addition, we provide a novel search technique that integrates value and policy networks with Monte Carlo simulation. By using this search technique, our programmed Alpha Go not only dominated other Go programmed with a winning percentage of 99.8 percent, but it also managed to beat the human European Go champion by a score of 5 games to 0. After waiting what seemed like a lifetime, a computer programmed has finally beaten a human professional player in a full-sized game of Go.

Stochastic Gradient Descent for LargeScale Machine Learning

Data sizes have outpaced processing speeds within the last decade. Rather than sample size, computation time limits the possibilities of statistical machine learning approaches in this case. For both smallscale and large-scale learning challenges, a more detailed investigation reveals qualitatively distinct tradeoffs. When dealing with large-scale problems, the computational complexity of the optimization procedure becomes nontrivial. Stochastic gradient descent and other unlikely optimization methods work very well on large-scale tasks. Two specific stochastic gradient methods, averaged stochastic gradient and secondorder stochastic gradient, achieve asymptotic efficiency after a single training set run.

Research on the Internet of Things (IoT) and Artificial Intelligence (AI) for Intelligent Government

A network of physical items that are able to communicate with one another and share data thanks to embedded electronics, software, sensors, and actuators is known as the Internet of Things (IoT). Governments may build apps and acquire

information utilizing Artificial Intelligence (AI) approaches from the massive volumes of data generated by users, sensors, and networks. Therefore, in several fields including transportation, energy, healthcare, education, and public safety, IoT and AI may pave the way for the creation of worthwhile services for individuals, companies, and government agencies. A thorough research framework that incorporates both IoT and AI components for smart government transformation is proposed in this guest editorial for the special issue on IoT and AI for Smart Government. The editorial identifies the difficulties associated with adopting and implementing these technologies in the public sector. A short synopsis of each of the six articles comprising this special edition follows the editorial. Lastly, this special issue presents an agenda for future research on AI and the Internet of Things (IoT) for smart governance, building on the suggested framework and identifying gaps in the current literature. Specifically, the agenda calls for four things:(1) performing domain-specific studies;(2) moving beyond adoption studies to investigate how these technologies are put into practice and assessed;(3) zeroing in on particular obstacles and, by extension, easy victories; and(4) broadening the current toolbox of research methodologies and theoretical underpinnings.

METHODOLOGY:

Here is the model that this project is made of:

1) Create a Deep Learning Model for Handwritten Digits Recognition: We are constructing a CNN-based handwriting model that takes digit images as input and then predicts the name of the digit. In order to create a convolutional neural network (CNN) model, two sets of pictures are needed: train images, which include every conceivable form of digit that a person may write, and test images, which are used to see whether the train model is improving its prediction accuracy. Cnn will construct the training model by using all of the training photos. We will develop a model by extracting features from train photos. We will also apply the train model on the test picture after extracting its features in order to categorise it during testing.

2) Using this module, we will construct a deep learning model for sentiment identification that is based on both text and images. To create a text-based sentiment model, we will employ every conceivable positive and negative term. In order to create an image-based sentiment model, we will be using a wide variety of face expression photographs. We can use the

train model to anticipate the sentiment of any input, whether it text or visual.

3) submit Test Image and Recognise Digit: This module allows us to submit text images and apply a train model to identify digital characters.

4) Express Your Views on Government Policy: This section will allow users to submit their views on policy matters, which will subsequently be stored inside the programme for sentiment analysis.

5) See How People Feel About Things: This module allows users to see how other people feel about things based on their opinions and the feelings that were recognised by a CNN model.

6) Submit Your Photo With Your Facial Expression Regarding Government Policies: This module allows users to submit photos of themselves with their facial expressions, indicating their level of satisfaction with the proposed system.

7) See Face Expression Images With discovered Sentiment: This module allows users to see submitted images of face expressions together with the sentiments that were discovered.

CONCLUSION:

More and more government agencies are using AI and deep learning to enhance their systems and services, thanks to the recent advancements in these technologies. The absence of specialists, computing resources, trust, and interpretability in AI are only a few of the many obstacles that prevent widespread use of such technology.

Using the Gulf States as a case study, this article first defines AI and e-government, then discusses the global e-government indices as they are right now, and then proposes strategies to improve these indices. To aid in the comprehensive management of the e-government lifecycle, we put up a framework for the administration of government information resources. Our next step was to provide a suite of deep learning methods that would streamline and automate various online public services. Following that, we put out a smart platform for e-government AI development and deployment.

To increase the overall efficiency, transparency, and trustworthiness of egovernment, this article aims to provide new frameworks and platforms for integrating AI approaches into egovernment systems and services.

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