A STUDY ON ARTIFICIAL INTELLIGENCE OPERATING SYSTEM

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Abstract- Developing an artificial intelligence based operating system has been a real challenge, however it has become a reality now. This paper reviews about how fields of Artificial Intelligence such as Intelligent Systems, Fuzzy Logic Systems, Natural Language Processing, Expert Systems and Artificial Neural Networks helps in obtaining an Artificially Intelligent Operating System which makes easier approach to the new techniques and which is very handy for human beings in day-to-day life. This also includes OS based on AI which already exists. Advantages and Issues have been discussed as well. The paper concludes by analyzing the need of AIOS and also issues related to it.
Keywords: Artificial intelligence operating system, Intelligent Systems, Fuzzy Logic Systems, Natural Language Processing, Expert Systems, Artificial Neural Networks.

1. INTRODUCTION

Artificial intelligence operating system is a system that manages computer software and hardware and provides common service for the computer using its intelligence by a computer or a machine in order to solve complex problems with ease. Operating system has evolved from command line to windows and then emerged to app rich Operating System. And soon artificial intelligence will have to play a role in Operating systems. According to the philosophy, Artificial Intelligence can be divided into Strong AI and weak AI. Strong AI could be made to think or in other words could represent human minds in future where as in the other hand Weak AI can be made to act as if they are intelligent. Therefore, Strong AI is highly recommended for Artificial Intelligence Operating systems. Other fields of AI such as Intelligent Systems and Expert Systems, Fuzzy logic systems and Artificial Neural Networks and Natural Language Processing could be used in order to have artificially intelligent based operating system.

Intelligent Systems and Expert Systems:
Intelligent systems are used to support decision-making and problem-solving applications. Their benefits include:

- Enhanced problem-solving.
- Improved decision quality.
- Ability to solve complex problems.
- Consistent decisions.

In Operating System, Intelligent System helps in choosing the best application to open a file, documents, Audio, Image and Video. Intelligent System will reduce the time and will choose the best possible outputs to be displayed in an OS as per users need.

An expert system is a system program that attempts to mimic human experts by the system's capability to render advice, to teach and execute intelligent tasks.

The expert systems are capable of -

- Advising
- Instructing and assisting human in decision making
- Demonstrating
- Deriving a solution
- Diagnosing
- Explaining
- Interpreting input
- Predicting results
- Justifying the conclusion
- Suggesting alternative options to a problem.

In OS expert systems will help in assisting the user in many ways such as advising and providing instructions to the problems such as memory management, crashes in OS etc. Expert systems can be used build a better User Interface as well.

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1.1 Fuzzy logic systems and Artificial Neural Networks:
Fuzzy logic systems receive incomplete, ambiguous, distorted, or inaccurate (fuzzy) input but in turn it provides acceptable definite output. The approach of FL imitates the way of decision making in humans. Elements of an operating system such as process management, file management, storage management, distributed system management, etc., can be used to tackle the problems by fuzzy information after it is fuzzified. A fuzzy logic system allows operation of computer systems for the users in convenient and natural manner in both certain and uncertain environments. Fuzzy logic systems make the computer systems work efficiently and economically under fuzzy and precise conditions.

The natural neural network of human nervous system has inspired artificial neural networks. ANN helps in speech recognition, speech classification, text to speech conversion, Pattern Recognition in facial recognition, optical character recognition, etc. In AIOS speech recognition can be used to perform certain task like opening an application in an OS. The feature of ANN such as Pattern Recognition in facial recognition can be used for security of the OS.

1.2 Natural Language Processing:
Natural Language Processing is AI method of communicating with intelligent systems using a natural language such as English. The field of NLP involves making systems to perform useful tasks with the natural languages humans use. Input and output of NLP Systems can be -
- Speech
- Written text.

NLPincludes two components i.e. natural language understanding and natural language generation. This component will help in understanding the vague input and delivering desired output for the AIOS. If certain inputs are not clear then NLP will help in analyzing them and providing the acceptable output. NLP works on the basis of Speech and text, this will help the user to command the OS even though the command is not certain. NLP also helps in checking for the syntactical, grammatical errors of the natural language considering the natural language to be English, Spanish or French. Hence, NLP has great role in AIOS.

2. CURRENT PROGRESS
AIOS based Operating system namely Cognition has been developed which helps as an intelligent assistant, electronic advisor, Offer engines and Chatbots. Artificial neural network based OS named NeurOS is developed. Its functions including perception, pattern learning and recognition, working memory, imagination, prediction, context priming, attention, abstraction, classification, associational thinking and behavior.NeurOS applications are inherently portable, scalable, networkable, extensible and embeddable. There are many projects under process for building a AIOS such as Jarvis. AI is also used Amazon's Alexa, Apple's Siri, Google's Now, and Microsoft's Cortana applications which act as an assistant. In addition, Windows metro delivered the capabilities of AIOS. But the User Interface represented just the folders and that was not able to deliver the next-generation experience of AIOS.

3. ADVANTAGES
OS based on AI is the future of Operating Systems, hence it could help human beings in many fields such as academic, defense, medical, research, scientific as well as for personal use. Many users would benefit as the AI learning process is continuous and the user will be updated by the OS in a short time. If OS based on AI is developed then it could help the users in performing expert tasks, mundane tasks and formal tasks with lot of ease. AS Program modification in AI is easy and quick it could also be possible to modify the OS based on AI as well. Modifying the AI does not affect the structure of an AI, hence AIOS would reduce the crashes that often occur in Operating Systems. At last, the AIOS would be a great merger from traditional Operating Systems to the OS which could reduce time of operation, parallelprocess management, improvised memory management, provide better security and understand the user to some context.

4. ISSUES
AI understands natural language and recognizes speech hence it's possible that it could understand sensitive information and e-mails in an OS which is a threat to the user.AI systems have replaced many professions and it could possibly try to replace a human beings or at least it will think on its own and make decisions of its own due to the intelligent capabilities of AI. If it is in implemented in AIOS there are possibilities that it could disappoint the user.   As AI requires lot of calculations, predictions, speech recognition and decision making its possible that it could slow down the OS and also it would require more external storages. Lack of common sense while reasoning will also disappoint the user of AIOS. If AIOS falls into wrong hands then it's obvious that it's a threat to human beings.

5. CONCLUSION
AI has a lot evolve, so is OS. AI based OS are being developed day by day. The Operating Systems that doesn't have AI lack the intelligence that intelligent systems have. In other words it lacks a brain which is artificially intelligent. We as humans would want a system which could act as our personal assistant that keeps track of the tasks such as appointments, upcoming events, news, take notes, set alarms etc. The goal of artificial intelligence is to create systems whose intelligence equals or

surpasses humans. If this goal is achieved then we will have an AI based OS as well. As a conclusion there is prominent need for AI Operating system.

6. REFERENCES

[1]   Nils J. Nilsson, "Artificial Intelligence, A New Synthesis", Morgan Kaufmann Publishers, Inc.

[2]   JatinBorana, "Applications of Artificial Intelligence & Associated Technologies", Proceeding of International Conference on Emerging Technologies in Engineering, Biomedical, Management and Science [ETEBMS-2016], 5-6 March 2016.

[3]   Stéphane Bura, "AI and the future of operating systems", Information Services & Use 36 (2016) 127–131 DOI 10.3233/ISU-160794, IOS Press.

[4]   Nadeesha O. Ranasinghe, "Artificial Intelligence in Distributed Operating Systems".

[5]   Sergey Korneev, "Artificial Intelligence Operating System".

[6]   L. Xie, X. Du, J. Chen, Y. Zheng and Z. Sun, "An introduction to intelligent operating system KZ2", ACM SIGOPS Operating Systems Review, ACM New York, USA, vol. 29, January 1995, 29-46.

[7]   S. Rusell and P. Norvig, "Artificial Intelligence: A Modern Approach",Prentice Hall Series in Artificial Intelligence, 2nd edition, December 2002.