

Importance of Ambient Intelligence (AmI) with Special Reference to Artificial Intelligence: An Analytical Study

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ABSTRACT

Human life is now going in such an environment where technologies become closer friends and family members. We prefer our cell phones to utilize our times rather than spending it with family members. Even we do more interaction with machines with compare to humans. Ambient Intelligence (AmI) is a modern technology in Computer Science and Information Technology (IT) that has potential for great impact in the future. The concept of AmI is that the people will be surrounded by intelligent objects that can sense the context and Situation and that can respond according to the desire of the people. AmI is a multidisciplinary area that combines the features of many areas in Computer Science. In last five years, we have seen significant advancement in various technologies that is mainly in three key area, that are Virtual Environments, Mobile Communication and Sensors. By combining these three areas we get the new technique named as Ambient Intelligence (AmI).

Keywords : Ambient Intelligence, (AmI), Artificial Intelligence (AI), Ubiquitous Computing, Ubiquitous Communication, User Interface, Emotional Intelligence

I. INTRODUCTION

Ambient Intelligence is a technique or a system can be built to take decisions to benefit the users of that environment based on real-time information gathered and historical data accumulated. An important aspect of AmI has to do with interaction. AmI has reduced the human-computer interaction as the system uses its intelligence to infer situations and user needs from the recorded activities, human assistant observes activities which is unfold with the expectation of the user to help them as required. Various users may need direct interaction with the system to indicate their preferences and needs. The environment around us, homes and offices, cars and cities, will develop a pervasive network of intelligent

devices that will cooperatively gather process and transport information.

II. IMPORTANCE OF ARTIFICIAL INTELLIGENCE

Artificial Intelligence is composed of two words **Artificial** and **Intelligence**, where Artificial defines "*man-made*," and Intelligence defines "*thinking ability*". So AI means "*a man-made thinking ability*." Artificial Intelligence exists when a machine has human's skills such as learning, reasoning, and solving problems.

In today's world, technology is growing very fast, and we are getting in touch with different new technologies day by day. One of the booming technologies of computer science is Artificial

Intelligence which is ready to create a new revolution in the world by making Intelligent machines. The Artificial Intelligence is now all around us. It is currently working with a variety of subfields, from general to specific, such as self-driving cars, playing chess, proving theorems, playing music, Painting, etc. AI is one of the fascinating and universal fields of Computer science which has a great scope in future. AI holds a tendency to cause a machine to work as a human.

Artificial Intelligence (AI) has become very important part of our daily lives, business operations and society. Intelligence machines are influencing every facet of our lives to improve efficiencies and human capabilities. So, it can be said that AI is intertwined in all that we do in routine life and it's hard to imagine living our life without the concept of AI.

Everyday Influences of Artificial Intelligence

The concept of Artificial Intelligence is changing the way our daily lives look. If someone see the lifestyle and technology from the year 1950s to 2019 or 2020, they would marvel at the way of using smartphones to navigate around town, virtual digital assistants such as Alexa and Cortana respond to our queries and our addiction to social media channels such as Facebook, Instagram and Twitter. There's no doubt that Artificial Intelligence is an integral part of our daily lives.

Artificial Intelligence techniques are increasing in our financial institutions, legal institutions, media companies and insurance companies. From fraud detection to writing news stories with natural language processing and reviewing law briefs, The concept of AI has reach is extensively everywhere.

Artificial Intelligence Influences Business

Artificial Intelligence is useful in business leaders to reach at competitive advantage as well as cost and time saving tool, the AI technology is changing the industries from finance to manufacturing with new products, processes and capabilities.

Companies such as 150-year-old Heineken are also widely using AI for the data they have collected and the Internet of Things to drive marketing decisions and initiatives, improve operations and customer services. From managing global supply chains to optimizing delivery routes, Artificial Intelligence is helping companies of all sizes and in all industries improve productivity and the bottom line at every stage of the business lifecycle from sourcing material to sales and accounting to customer service. It's allowing companies to design, produce and deliver products and service better than ever before.

Life-Saving AI

AI is an integral part of our safety and security systems. Artificial intelligence is improving lives as well as it is a great tool to save lives. There are many companies, including tech companies, that are investing so that Artificial Intelligence can help improve our healthcare system. Robots can be now used to assist in surgeries and it is better than to figure out personalized drug protocols as a diagnostic tool. Healthcare system of many organizations are changing because of implementation of the concept of AI. With this AI is also successfully changing the environmental concerns because of global warming. AI is very helpful in human efforts to solve the critical issue of global challenges. As AI is supporting smart infrastructure which helps more efficiently with our natural resources and smart agriculture to feed a fast-growing population.

AI as Entertainment

AI and its various features of entertainment is enhancing our lives and we are doing many successful experiments with AI to compose original compositions from books to music, develop recipes based on what's currently in the cupboard and even to create works of art are extending the influence of AI on our lives. The AI-powered recommendation engines of Netflix and Spotify help streamline our decision-making process when we are looking for the next show to watch or song to listen to.

It can be easily said that AI become an important part of our life and we can't keep AI away from our life now, without AI our life and world would look vastly different in every aspect. As the current time the best investments and research result in expanded and perfected uses of AI, we can expect the AI technology to become more entangled into our society, daily existence and workplaces. Five reasons for importance of AI:

1. *Artificial Intelligence will create new jobs in healthcare system.*
2. AI is revolutionizing how the health sector works by reducing spending and improve patient outcomes.
3. Artificial Intelligence will bring new concept of revolutionize agriculture.
4. Artificial Intelligence will eliminate the need for you to perform tough task.
5. AI will increase auto safety and it decrease traffic complications.

Artificial Intelligence is being widely used in many industries. The advancements in AI technology is really very beneficial if properly understood, utilized and trusted. An important example of Artificial Intelligence is drones, robots, and autonomous vehicles.

III. IMPORTANCE OF AMBIENT INTELLIGENCE (AMI)

In last few years mobile computing revolution has been observed in field of Computer Science. According to research firm IHS Markit Smartphone installation is expected to reach 6 billion by the end of 2020, over half of the world's population are carrying and using personal devices that have powerful processors, sensors, cameras, high speed communications and intelligent applications. In the coming ten years that is 2020 to 2030, an Ambient Intelligence (AmI) revolution will be coming where all the above-mentioned technologies will be embedded in our homes, grocery stores, offices, hospitals and transportation services. AmI will be one of the key elements of the Fourth Industrial Revolution.

In the vision of Ubiquitous Computing IoT and Intelligent IoT and Fog Computing are in Trends, they are technology trends in computer vision and AmI. It is also important to know about Ambient Intelligence how Internet of Things (IoT) is explored and its solutions should incorporate AmI properties to address the users, business and society.

Ambient intelligence (AmI) deals with ubiquitous computing devices, where physical environments interact with people intelligently and unobtrusively. AmI environments should be well aware of people's needs, customizing their requirements and forecasting behaviours. AmI environments can be diverse, such as homes, offices, meeting rooms, schools, hospitals, control centres, vehicles, tourist attractions, stores, sports facilities, and music devices. Artificial intelligence research aims to include more intelligence in AmI environments, allowing better support for humans and access to the essential knowledge for making better decisions when interacting with these environments.

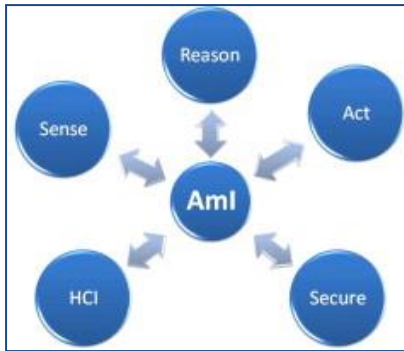


Figure 1. AmI Characteristics

Ambient intelligence (AmI) is multidisciplinary technology of invisible Computer. and Ubiquitous Computing. AmI fosters novel anthropomorphic human-machine interaction. In AmI such technology is developed where human user moves into the foreground and technologies make computers disappear in the background within the complete control of the augmented environment. AmI is a user-centric concept, it supports a variety of Artificial Intelligence methods and works pervasively, nonintrusive, and transparently to aid the user. AmI supports and promotes interdisciplinary research encompassing the technological, scientific and artistic fields creating a virtual support for embedded and distributed intelligence.

IV. IMPORTANCE OF AMBIENT INTELLIGENCE WITH REFERENCE TO ARTIFICIAL INTELLIGENCE

Ambient Intelligence is when you go out of the house and your thermostat automatically adjusts the heating to preserve electricity, in other hand Artificial Intelligence is when it asks you why you would not be living the house today. Ambient intelligence may involve Artificial Intelligence, but pre-programmed systems that are sensitive to humans also qualify.

Ambient Intelligence (AmI) deals with computing devices that are spread everywhere (ubiquity) and

they allow the human being to interact in physical world environments in an intelligent and unobtrusive way. **Ambient Intelligence involves various disciplines**, like automation (sensors, control, and actuators), human-machine interaction and computer graphics, communication, ubiquitous computing, embedded systems.

Artificial Intelligence, research include more intelligence in the AmI environments, it allows a better support to the human being and the access to the essential knowledge to make better decisions when interacting with these environments.

Ambient Intelligence is not possible without Artificial Intelligence, they are similar in many techniques. AI researchers must be aware of the need to integrate their techniques with other scientific communities' techniques (e.g. Automation, Computer Graphics, Communications). Ambient Intelligence is a tremendous challenge, needing the better effort of different scientific communities.

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