

SOFT SKILLS
ASSIGNMENT NO. 8: REPORT WRITING
ON
Artificial Intelligence



REPORT SUBMITTED
TO
VISHWAKARMA INSTITUTE OF INFORMATION TECHNOLOGY,
PUNE

DEPARTMENT OF ARTTICIAL
INTELLIGENCE AND DATA SCIENCE

AY 2022-23

Semester IV

BY

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Class: SY B

Batch: B2

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Introduction

While a number of definitions of artificial intelligence (AI) have surfaced over the last few decades, John McCarthy offers the following definition in this 2004 [paper](#) (PDF, 106 KB) (link resides outside IBM), " It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable."

However, decades before this definition, the birth of the artificial intelligence conversation was denoted by Alan Turing's seminal work, "Computing Machinery and Intelligence" (PDF, 89.8 KB) (link resides outside of IBM), which was published in 1950. In this paper, Turing, often referred to as the "father of computer science", asks the following question, "Can machines think?" From there, he offers a test, now famously known as the "Turing Test", where a human interrogator would try to distinguish between a computer and human text response. While this test has undergone much scrutiny since its publish, it remains an important part of the history of AI as well as an ongoing concept within philosophy as it utilizes ideas around linguistics.

At its simplest form, artificial intelligence is a field, which combines computer science and robust datasets, to enable problem-solving. It also encompasses sub-fields of machine learning and deep learning, which are frequently mentioned in conjunction with artificial intelligence. These disciplines are comprised of AI algorithms which seek to create expert systems which make predictions or classifications based on input data.

Today, a lot of hype still surrounds AI development, which is expected of any new emerging technology in the market. As noted in Gartner's hype cycle (link resides outside IBM), product innovations like, self-driving cars and personal assistants, follow "a typical progression of innovation, from overenthusiasm through a period of disillusionment to an eventual understanding of the innovation's relevance and role in a market or domain." As Lex Fridman notes [here](#) (01:08:05) (link resides outside IBM) in his MIT lecture in 2019, we are at the peak of inflated expectations, approaching the trough of disillusionment.

How Artificial Intelligence is transforming the world?

In some way, it should be obvious how technology can fundamentally transform the world. We just have to look at how much the world has already changed. If you could invite a family of hunter-gatherers from 20,000 years ago on your next flight, they would be pretty surprised. Technology has changed our world already, so we should expect that it can happen again.

But while we have seen the world transform before, we have seen these transformations play out over the course of generations. What is different now is how very rapid these technological changes have become. In the past, the technologies that our ancestors used in their childhood were still central to their lives in their old age. This has not been the case anymore for recent generations. Instead, it has become common that technologies unimaginable in one's youth become ordinary in later life.

This is the first reason we might not take the prospect seriously: it is easy to underestimate the speed at which technology can change the world.

The second reason why it is difficult to take the possibility of transformative AI – potentially even AI as intelligent as humans – seriously is that it is an idea that we first heard in the cinema. It is not surprising that for many of us, the first reaction to a scenario in which machines have human-like capabilities is the same as if you had asked us to take seriously a future in which vampires, werewolves, or zombies roam the planet.¹

But it is plausible that it is both the stuff of sci-fi fantasy *and* the central invention that could arrive in our, or our children's, lifetimes.

The third reason why it is difficult to take this prospect seriously is by failing to see that powerful AI could lead to very large changes. This is also understandable. It is difficult to form an idea of a future that is very different from our own time. There are two concepts that I find helpful in imagining a very different future with artificial intelligence. Let's look at both of them.

Benefits of Artificial intelligence

Smart Decision-Making

Companies are using AI technology to streamline their daily processes, analyse upcoming trends, forecast growth, and predict outcomes. For instance, anytime a customer places an item into their shopping cart on the websites of some major retailers, they are immediately given an additional suggested item to purchase based on an advanced algorithm. This algorithm has been programmed to compare thousands of other customers who have purchased similar items and make an informed suggestion. Additionally, social media platforms use a form of applied AI, known as machine learning, to display specific content to their users, and the more an individual uses the platform, the more the AI learns about them. By utilizing extensive neural networking, machine learning becomes superior in smart decision making.

Automation

Automation is a major benefit of artificial intelligence in the business world. Businesses use automation to stay connected with new and returning customers through auto-reply emails, appointment reminders, and feedback surveys. If you've ever purchased a coffee and received an instantaneous text receipt, that's just one example of how AI is improving business practices. Furthermore, many online retailers rely on automation through drop shipment suppliers to streamline their processes, reduce the need for large storage facilities, and increase their efficacy. Through limiting human input by way of automation, businesses can make better use of their employees' skills and time.

Medical Progression

Modern medicine has also embraced AI in helping doctors and nurses diagnose and treat patients without requiring an expensive or time-consuming hospital visit. For example, doctors can track a diabetic patient's glucose levels with the assistance of a glucose monitoring app, and that same patient can get real-time data about their health from the comfort of their home. Patient records and medical history can be shared within seconds from hospital to hospital through online portals, and crucial information can be gathered for community health outcomes, as seen with recent at-home tracing during the COVID-19 pandemic. Essentially, medical professionals can focus more on the needs of the patient and community while AI does the busy work.

Improved Customer Experience

The days of calling for customer service and waiting on hold to speak with someone are quickly becoming a thing of the past. Many companies now use online chatbots to make responding to and problem-solving for customer concerns a simpler process. Through programmed natural language processing (NLP), chatbots can learn and mimic natural human language. Chatbots

also use prediction software to learn and adapt to each customer's inquiry, providing fast and customer-cantered solutions.

Research and Data Analysis

With the assistance of AI, research and data scientists are able to better analyse patterns, predict outcomes, and make adjustments in half the time. Information that would have taken months to collect now can be done in minutes, if not seconds. For example, a language learning app, like Duolingo or Babel, might discover that half of their users plateau in fluency after three months of learning and incorporate more supportive lessons to fill that gap. Or a meal delivery service might use an algorithm to learn that stay-at-home moms more regularly check their emails and meal plan in the mornings and pivot their email marketing to gain the best results. The wealth of knowledge that's gained from artificial intelligence research and data analysis is indispensable.

Perform Repetitive Tasks

More and more, businesses are looking for ways to increase productivity, and AI helps eliminate monotonous, repetitive tasks that often take time away from an efficient workday. It's estimated that workers spend two and a half hours every day reading and responding to emails, making "inbox zero" (the email management strategy that aims to keep one's inbox empty) truly a myth. Browser extensions, such as Grammarly or Hemingway, use an AI program to automatically correct spelling and writing errors, reducing the time needed for proofreading, and email plug-ins, like Boomerang, perform repetitive tasks by automatically scheduling email responses.

Additionally, companies are now using robotic process automation (RPA) that can be programmed to interact with a system in the same way human intelligence would. RPA takes on repetitive tasks, like cross-checking invoices with purchase orders or ordering products when stock levels hit a limit, enabling workers to focus on value-added work versus repetition.

Risks and dangers of Artificial Intelligence

JOB LOSSES DUE TO AI AUTOMATION

AI-powered job automation is a pressing concern as the technology is adopted in industries like marketing, manufacturing and healthcare. Eighty-five million jobs are expected to be lost to automation between 2020 and 2025, with Black and Latino employees left especially vulnerable.

“The reason we have a low unemployment rate, which doesn’t actually capture people that aren’t looking for work, is largely that lower-wage service sector jobs have been pretty robustly created by this economy,” futurist Martin Ford told Built In. “I don’t think that’s going to continue.”

As AI robots become smarter and more dexterous, the same tasks will require fewer humans. And while it’s true that AI will create 97 million new jobs by 2025, many employees won’t have the skills needed for these technical roles and could get left behind if companies don’t upskill their workforces.

Working of Artificial Intelligence

Artificial intelligence (AI) is a complex and interdisciplinary field that involves a wide range of techniques and approaches. At a high level, AI involves the development of algorithms and computer systems that can learn and make decisions based on data.

The general process of building an AI system involves several key steps, including:

1. **Data collection:** The first step in building an AI system is to gather and preprocess relevant data. This can involve collecting data from a variety of sources, such as sensors, social media, or databases.
2. **Data labeling and annotation:** Once the data is collected, it must be labeled and annotated so that the AI system can learn from it. This can involve identifying patterns, relationships, and other important features in the data.
3. **Model training:** After the data is labeled and annotated, it is used to train an AI model. This involves using algorithms to identify patterns and relationships in the data and adjusting the model parameters to optimize performance.
4. **Model evaluation:** Once the model is trained, it is evaluated on a separate set of data to determine how well it performs. This can involve testing the model on a variety of tasks, such as image recognition, speech recognition, or natural language processing.
5. **Deployment:** Finally, the AI system is deployed to perform its intended function. This can involve integrating the model into a larger system, such as a self-driving car, a chatbot, or a recommendation engine.

Overall, the goal of AI is to create computer systems that can learn from data and make decisions autonomously, without human intervention. This involves a wide range of techniques, including machine **learning**, **deep learning**, **natural language processing**, and **computer vision**.

Artificial Intelligence Latest Trends

The augmented workforce

There have always been fears that machines or robots will replace human workers and maybe even make some roles redundant. However, as companies navigate the process of creating data and AI-literate cultures within their teams, we will increasingly find ourselves working with or alongside machines that use smart and cognitive functionality to boost our own abilities and skills. In some functions, such as marketing, we're already used to using tools that help us determine which leads are worth pursuing and what value we can expect from potential customers. In engineering roles, AI tools help us by providing predictive maintenance – letting us know ahead of time when machines will need servicing or repairing. In knowledge industries, such as law, we will increasingly use tools that help us sort through the ever-growing amount of data that's available to find the nuggets of information that we need for a particular task. In just about every occupation, smart tools and services are emerging that can help us do our jobs more efficiently, and in 2022 more of us will find that they are a part of our everyday working lives.

Bigger and better language modelling

Language modelling is a process that allows machines to understand and communicate with us in language we understand – or even take natural human languages and turn them into computer code that can run programs and applications. We have recently seen the release of GPT-3 by OpenAI, the most advanced (and largest) language model ever created, consisting of around 175 billion “parameters”- variables and datapoints that machines can use to process language. OpenAI is known to be working on a successor, GPT-4, that will be even more powerful. Although details haven't been confirmed, some estimate that it may contain up to 100 trillion parameters, making it 500 times larger than GPT-3, and in theory taking a big step closer to being able to create language and hold conversations that are indistinguishable from those of a human. It will also become much better at creating computer code.

AI in cybersecurity

This year the World Economic Forum identified cybercrime as potentially posing a more significant risk to society than terrorism. As machines take over more of our lives, hacking and cybercrime inevitably become more of a problem, as every connected device you add to a network is inevitably a potential point-of-failure that an attacker could use against you. As networks of connected devices become more complex, identifying those points of failure becomes more complex. This is where AI can play a role, though. By analysing network traffic and learning to recognize patterns that suggest nefarious intentions, smart algorithms

are increasingly playing a role in keeping us safe from 21st-century crime. Some of the most significant applications of AI that we will see develop in 2022 are likely to be in this area.

Conclusion

The future of AI is both exciting and uncertain. On the one hand, AI has the potential to revolutionize many areas of human life, from healthcare and transportation to finance and education. AI systems can process vast amounts of data and make decisions quickly and accurately, which could lead to significant improvements in efficiency and productivity.

On the other hand, there are concerns about the potential impact of AI on society. As AI becomes more advanced, there is a risk that it could replace human workers in many industries, leading to widespread job displacement. There are also concerns about the potential misuse of AI, such as the use of facial recognition technology for surveillance or the use of AI algorithms to make decisions that could have discriminatory effects.

Despite these challenges, many experts believe that the future of AI is bright. Advances in AI technology are likely to continue at a rapid pace, and there is a growing focus on developing AI systems that are transparent, accountable, and aligned with human values. Ultimately, the success of AI will depend on how well we can balance the potential benefits with the potential risks and ensure that AI is developed in a way that benefits everyone.

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