



---

**KENNESAW STATE**  
UNIVERSITY

# Data Collection Analysis of Emerging AI & ML

# Introduction

- Data collection is the process of gathering and measuring information on variables of interest
- Collecting data and storing the information is important in order to analyze and learn from these statistics
- Data collection is a vital component of AI and Machine Learning

- There are many new emerging technologies in the field of artificial intelligence
- Whether people are aware of it or not, they are typically benefitting from these technologies every time they use their phone or use an app that has machine learning programmed into it

# Quality Assurance



- Quality assurance and quality control are two ways to guarantee accurate data. Quality assurance is a preprocessing technique used by companies to ensure their information is correct.
- The information gathered from data collection can be used with Artificial intelligence and machine learning to improve algorithms and create accurate results

# Machine Learning

- Machine learning is a branch of artificial intelligence that allows machines to learn from their experiences and use this information to improve their functions
- There are many different approaches to machine learning that we will be discussing in this report, as well as a wide array of different uses in technology

# Supervised Learning

- In this approach, machines are given labelled sets of data which is used to produce a specific output
- The machine learns through training sessions with this data
- For example, a team of doctors could provide a system with labelled medical data and train the system to be able to diagnose patients with similar given data
- This is considered the least complex approach to machine learning

# Unsupervised Learning

- This approach forces the machine to analyze and identify patterns in its given data
- The machine uses these identified patterns for tasks such as categorization or counting
- None or very little human intervention needed
- Implementation requires more complex algorithms than supervised learning
- Useful for categorizing data such as images

# Reinforcement Learning

- Uses trial and error approach to machine learning
- Rewards and penalties are given to the machine based off its output
- The systems goal is to gain as many rewards as possible while avoiding penalties
- This is very useful for training systems such as self-driving cars to avoid accidents

# Deep Learning

- Deep learning is a type of unsupervised learning where neural pathways are created in a system that attempt to recreate the pathways found in the human brain
- This allows the system to analyze input independently and is completely autonomous
- Creating deep learning systems is more complex than other ML methods and requires large amounts of data to utilize

# Application of AI

The World of Bioengineering

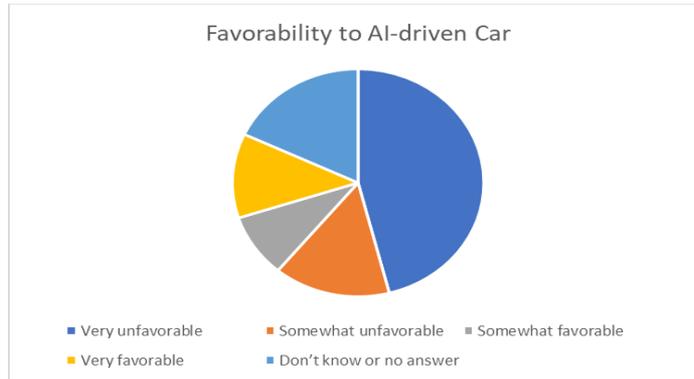


- In contemporary times, people need a faster way of accessing data. Along with accessing data, people need a way of taking that data and manipulating it for a new result and writing that data to an interface that could then be used by another application or a human being.
- Society's opinion for AI has been consistent throughout most surveys. In two surveys about AI, the breakdown for interest in two things were apparent.

# Data

	Percentage (%)
Very Unfavorable	46%
Somewhat Unfavorable	15%
Somewhat Favorable	9%
Very Favorable	12%
No Answer	18%

	Percentage (%)
Very Unfavorable	48%
Somewhat Unfavorable	14%
Somewhat Favorable	8%
Very Favorable	11%
No Answer	21%



# What A.I. Means to Business



- In business, some aspects are redundant and could be automated to speed up workflow
- Along with business processes, GPS navigation has been a major player in recent technologies
- This form of transportation needs navigation through the twisting turns and endless cornerstones of the American grid infrastructure

- The field of navigation has benefited greatly from the addition of AI and has cut the number of man-hours spent on creating hundreds of thousands of localized maps for the individual to use for their day-to-day travel
- Artificial Intelligence is being used every day in our lives. IBM Watson is used to predict weather patterns. This can affect what we plan to do on a given day to what we wear. Not only is Watson used for business but now has been incorporated into sports

# AI Implementation

# Intentionality

- Intentionality refers to the AI's ability to make decisions based on real-time data.
- These machine AI can output predetermined responses based on the sensors of the AI. They aren't limited to just sensory data, but remote inputs, or a combination of different data sources. This allows the analysis and decision-making of an AI to be able to be more sophisticated.

# Intelligence

- Intelligence can be an important aspect of designing AI and implementing it in the business world as well
- Machine learning takes such data and finds trends and patterns within it. These trends and patterns are utilized by software engineers to break down specific issues. This data can come in the form of satellite images, binary information, visual, text, or some form of data lake.
- The intelligence of A.I. increases as the system is used more. As more patterns are found, A.I. begins to “learn” more, therefore gaining knowledge that it previously did not have.

# Adaptability

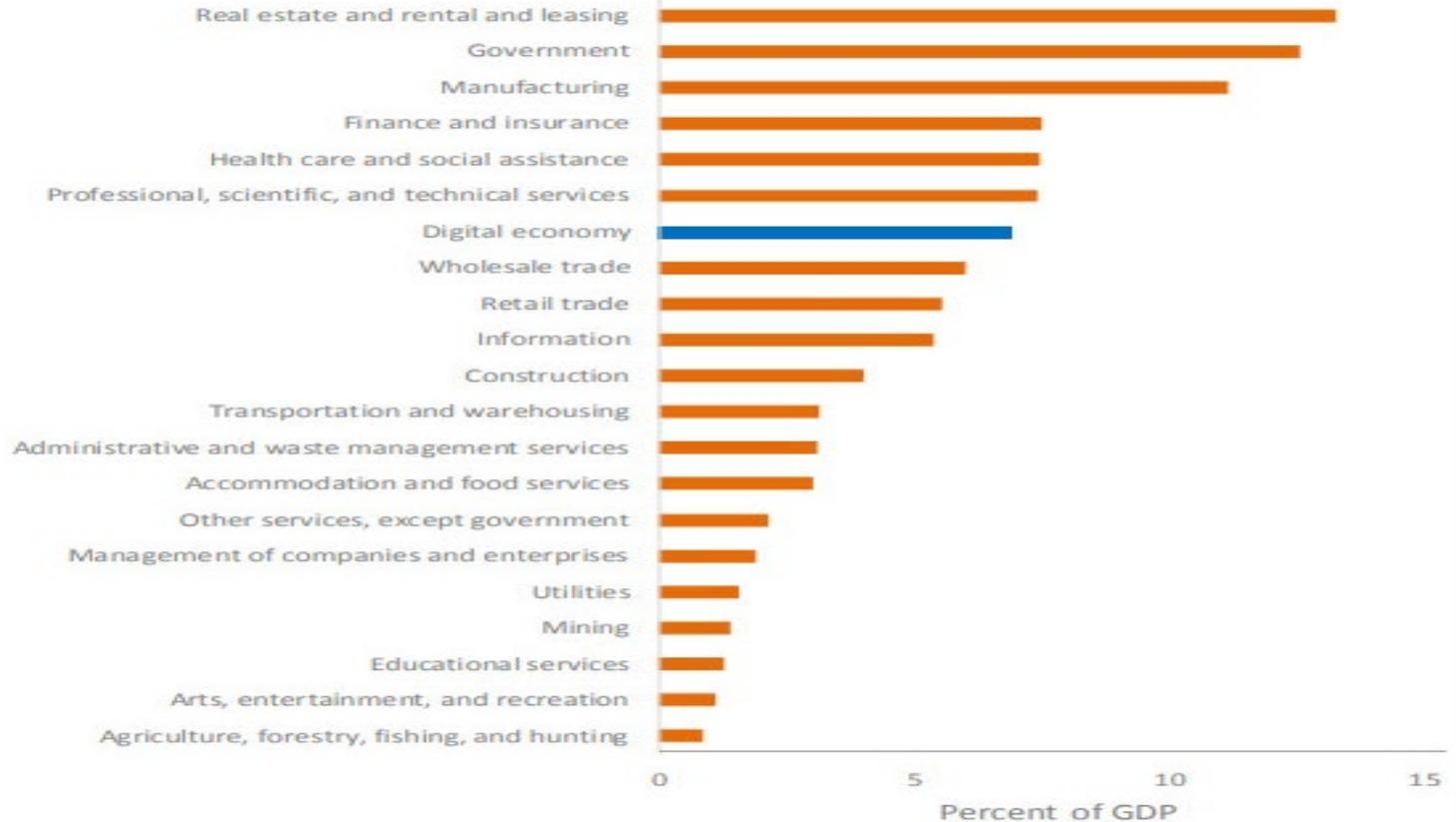
- Adaptability allows AI systems to have the ability to acquire new tools and new ways of seeking out information
- One such example of the flexibility and adaptability of this new technology is the ability to see through the lens of other vehicles on the road and the ability to acquire new information from other vehicles

# Economic Contribution Of AI

- As a business application, many senior business leaders are not aware of the applications of Artificial Intelligence in a business environment.
- Opening new avenues of using department resources and reinvigorating administrative industries of the American economy
- Along with this significant margin, other sectors of the American economy grew as well with the help of new infrastructure in place through new network equipment, new software, new smart phones, and so on.

# Data

## Digital Economy and Industry Share of Total Gross Domestic Product, 2017



U.S. Bureau of Economic Analysis

# Conclusions

- With the emergence of Artificial Intelligence, there is a large breadth of fields the burgeoning industry can be applied to. This does come with its pitfalls; it is already showing an economic and social impact to society
- Machine learning itself can already be seen in many day-to-day applications such as facial identification and machine maintenance.
- Deep learning is likely to be the future of machine learning, although now it is more of a subset of machine learning.

# Future Research

- In the literature and surveys reviewed by this paper, it stands to show that the AI that currently exists in the world today has practical effects and popular interest
- Development and prototyping currently exists as well as for Augmented Reality, which would be a great addition to data visualization. This could be an enhancement for emerging artificial intelligence as well as machine learning and other areas for this field.
- As machines come closer to replicating the neural networks of the human brain, machines will become much more autonomous. In addition to the advancement of the technology, it will also become cheaper and easier to produce technologies that utilize AI and machine learning.

# References

- [1] West, D. (2019, October 25). Brookings survey finds only 21 percent willing to ride in a self-driving car. From <https://www.brookings.edu/blog/techtank/2018/07/23/brookings-survey-finds-only-21-percent-willing-to-ride-in-a-self-driving-car/>
- [2] West, D. (2019, October 25). Brookings survey finds 52 percent believe robots will perform most human activities in 30 years. Retrieved September 14, 2020, from <https://www.brookings.edu/blog/techtank/2018/06/21/brookings-survey-finds-52-percent-believe-robots-will-perform-most-human-activities-in-30-years/>
- [3] Artificial Intelligence. (n.d) from [https://www.merriam-webster.com/dictionary/artificial intelligence](https://www.merriam-webster.com/dictionary/artificial%20intelligence)
- [4] Mannix, Brian, “ Benefit-Cost Analysis and Emerging Technologies,” Governance of Emerging Technologies: Aligning Policy Analysis with the Public's Values, special report, Hastings Center Report 48, no. 1 (2018): S12-
- [5] Sahota, N (2020, July 1) How Artificial Intelligence Will Change Our Lives (it Already Has) Online. (n.d.). from <https://www.scribd.com/article/467789628/How-Artificial-Intelligence-Will-Change-Our-Lives-It-Already-Has>
- [6] Rajkomar, A., Dean, J., & Kohane, I. (2019). Machine learning in medicine. New England Journal of Medicine, 380(14), 1347-1358.
- [7] (n.d.). Retrieved September 14, 2020, from [https://ori.hhs.gov/education/products/n\\_illinois\\_u/datamanagement/dctopic.html](https://ori.hhs.gov/education/products/n_illinois_u/datamanagement/dctopic.html)

[8] Alloghani, Mohamed & Al-Jumeily, Dhiya & Mustafina, Jamila & Hussain, Abir & Aljaaf, Ahmed. (2020). A Systematic Review on Supervised and Unsupervised Machine Learning Algorithms for Data Science. 10.1007/978-3-030-22475-2\_1

[9] Sutton, R. S., & Barto, A. G. (2018). *Reinforcement learning: An introduction*. MIT press.

[10] Brownlee, J. (2020, June 29). What Is Data Preparation in a Machine Learning Project. Retrieved October 08, 2020, from <https://machinelearningmastery.com/what-is-data-preparation-in-machine-learning/>

[11] Murnane, K. (2016, April 05). What Is Deep Learning And How Is It Useful? Retrieved October 09, 2020, from <https://www.forbes.com/sites/kevinmurnane/2016/04/01/what-is-deep-learning-and-how-is-it-useful/>

[12] Frost, A (2020, January 29). Researchers using AI and satellite images to improve GPS navigation. (2020, January 28). Retrieved October 07, 2020, from <https://www.traffictechtoday.com/news/incident-detection/researchers-using-ai-and-satellite-images-to-improve-gps-navigation.html>

[13] West, D., & Allen, J. (2020, April 28). How artificial intelligence is transforming the world. Retrieved October 09, 2020, from <https://www.brookings.edu/research/how-artificial-intelligence-is-transforming-the-world/>

[14] David Rudini Chief Analytics Officer | Deloitte Analytics drudini@deloitte.com 1 212 618 4686. (2020, August 04). Cognitive technology survey: Early adoption insight: Deloitte US. Retrieved October 10, 2020, from <https://www2.deloitte.com/us/en/pages/deloitte-analytics/articles/cognitive-technology-adoption-survey.html>

[15] Digital Economy Accounted for 6.9 Percent of GDP in 2017. (n.d.). Retrieved October 10, 2020, from <https://www.ntia.doc.gov/blog/2019/digital-economy-accounted-69-percent-gdp-2017>

[16] Bresnick, Jennifer. "Top 12 Ways Artificial Intelligence Will Impact Healthcare." *HealthITAnalytics*, HealthITAnalytics, 25 Aug. 2020, [healthitanalytics.com/news/top-12-ways-artificial-intelligence-will-impact-healthcare](http://healthitanalytics.com/news/top-12-ways-artificial-intelligence-will-impact-healthcare).

[17] Iriondo, Roberto. "Machine Learning vs. AI, Important Differences Between Them." *Medium*, Towards AI-Multidisciplinary Science Journal, 28 Aug. 2020, [medium.com/towards-artificial-intelligence/differences-between-ai-and-machine-learning-and-why-it-matters-1255b182fc6](https://medium.com/towards-artificial-intelligence/differences-between-ai-and-machine-learning-and-why-it-matters-1255b182fc6).

