

Google Assistant

Self-Driving Cars

Apple Maps

Amazon Alexa

Cobots

Self-Serve Kiosks

Roomba

ChatGPT



**WHAT JUST HAPPENED**



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# The Robotics Revolution



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NAVIGATING AI, AUTOMATION AND THE WORKFORCE OF  
TOMORROW

BY: JODY LEE ALBERD, MSET

# Concerns and Doubts

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## CONCERNS

- “Will a robot take my job?”
- “How will the economy be affected?”
- “Will my data and privacy be compromised?”
- “Will we lose free will?”
- “Is it safe?”

## DOUBTS

- “I don’t understand how it works.”
- “I don’t think it will last.”
- “I don’t think it is useful.”
- “I don’t think it’s reliable.”
- “I don’t think it’s safe.”



# The Luddites

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- A 19<sup>th</sup>-century movement of English workers opposed to the mechanization of the textile industry.
- Engaged in sabotage of industrial equipment.
- Led to the Frame-Breaking Act of 1812 making the destruction of mechanized looms a capital felony.
- 60-70 Luddites were hanged in a 2 year period.
- Used to describe someone who is opposed or resistant to new technologies.





# Neo-Luddism and the Luddite Fallacy

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- A leaderless modern movement opposing many forms of modern technology.
- The Luddite Fallacy describes that:

*“There is a finite amount of work available and if machines do it, there can be none left for humans.”*



# Are they right?

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- Machines can do most of the “easy” work that requires less skill, talent, knowledge or insight.
- The definition of what is “easy” expands as information technology progresses.
- The work that lies beyond “easy” may require greater brainpower than most people have.

“The means of production will be controlled by the “machine owner” class...technology will create more economic inequality.”

-Stephen Hawking, Astrophysicist



# Will a robot take my job?

Yes...but...

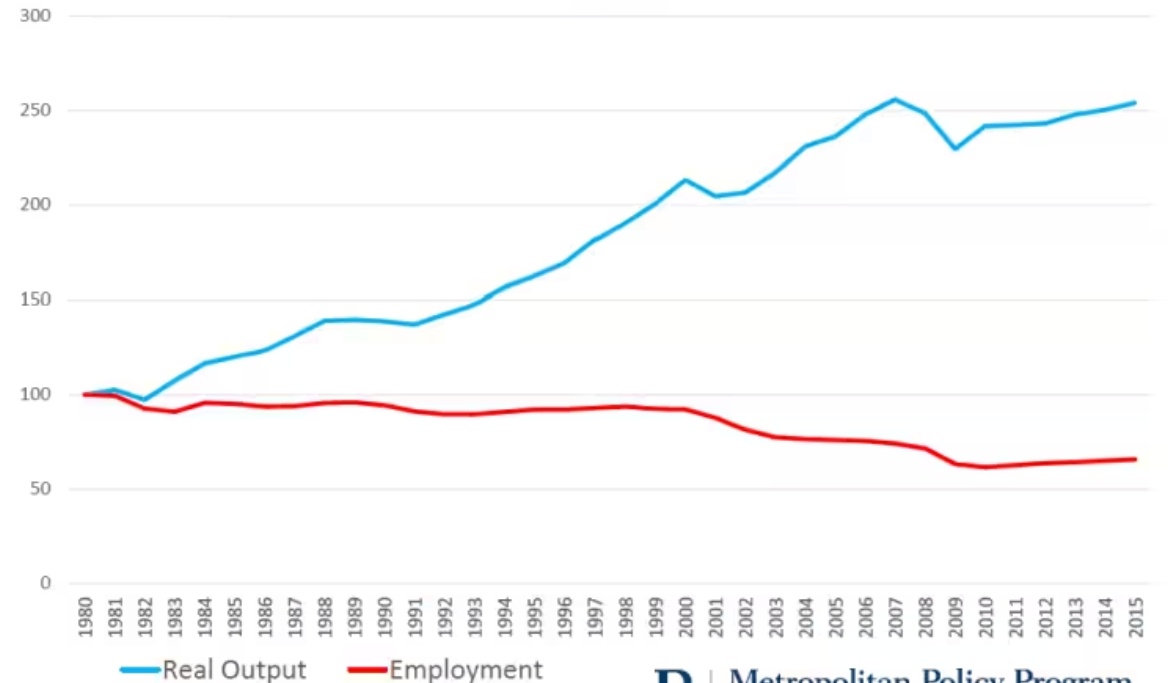
A 2013 Oxford University study suggested that 47% of jobs are at a high risk of being automated over the next 20 years.

While this is alarming, subsequent studies have shown that this is largely dependent upon the task being automated.

Recent studies have concluded that **automation doesn't replace jobs, automation replaces tasks** thereby freeing workers to perform other tasks.

## More Output, Less Employment

The manufacturing sector has gotten more productive, while giving fewer people jobs (normalized as a percent of levels in 1980).



Source: Brookings' analysis of Moody's Analytics estimates



# Automation in Agriculture

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In the early 1900's, 41% of the nation's workforce was employed on small farms.

A century later, this rate was 1.9% and continues to drop due to highly productive and mechanized farms using millions of tractors.

Robots will assume tasks such as planting, weeding and sorting using AI-enabled cameras.



# Automation in Agriculture

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***Why haven't we suffered 39% unemployment over the past century because of automation in the agriculture industry?***

# The Role of Robotics in Manufacturing

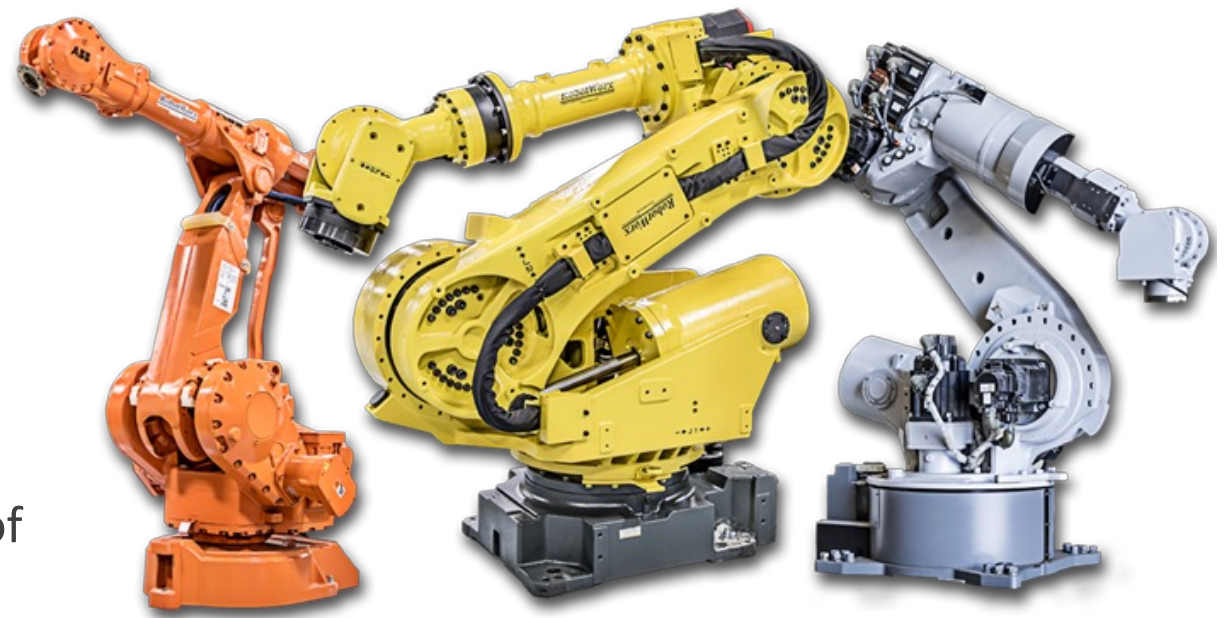
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The use of robotics in manufacturing started with the high-volume automotive industry.

General Motors introduced the use of robots for spot welding in 1961.

In 1969, the Stanford Arm was developed with six-degrees of freedom leading to an automation boom in the 1970's.

Today, robots are essential in making automotive plants competitive with over half of industrial robot purchases in North America being made by automakers.





# The Role of Robotics in Manufacturing

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The use of robots has evolved from a high-volume, automotive-only technology to today's landscape of "where can we put one to work?"

- "Collaborating with Robots", Smart Manufacturing, [sme.org](http://sme.org)

Currently, the manufacturing industry employs about 11 percent of the US workforce. This represents a decline of 1.4% between 2018 – 2023.



# Forklifts and Material Handling

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Forklift accidents result in 34,900 serious injuries and 61,800 non-serious injuries annually.

OSHA estimates 70% were preventable and based on human error.

Automated Guided Vehicles are a \$1.31 billion market that is expected to double in the next 5 years.

Amazon is the largest implementer with 520,000 AGV's, more than all other industries combined.



# Forklifts and Material Handling

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AGV's, while about 50% slower in performance, have proven to be safer and more consistent.

AGV's are less versatile and do not adjust to changes in environment as quickly.

While there continues to be a role for human operated forklifts based on the limitations of AGV's those limitations continue to be reduced resulting in a shrinking role for forklifts.





# The Role of Robotics in Manufacturing

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***Has increased automation driven a decline in labor in this industry or has the decline in labor driven an increase in automation?***

# Automating the Workplace

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## THE 4 “D’S”

- Dirty
  - Dull
  - Difficult
  - Dangerous
- Spoken of in terms of robotics but also applies to any implementation of automation.



# Will a robot take my job?

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## Job Displacement

In some industries and sectors, robots and automation technologies are used to replace certain tasks that are dull, dirty, dangerous and difficult.





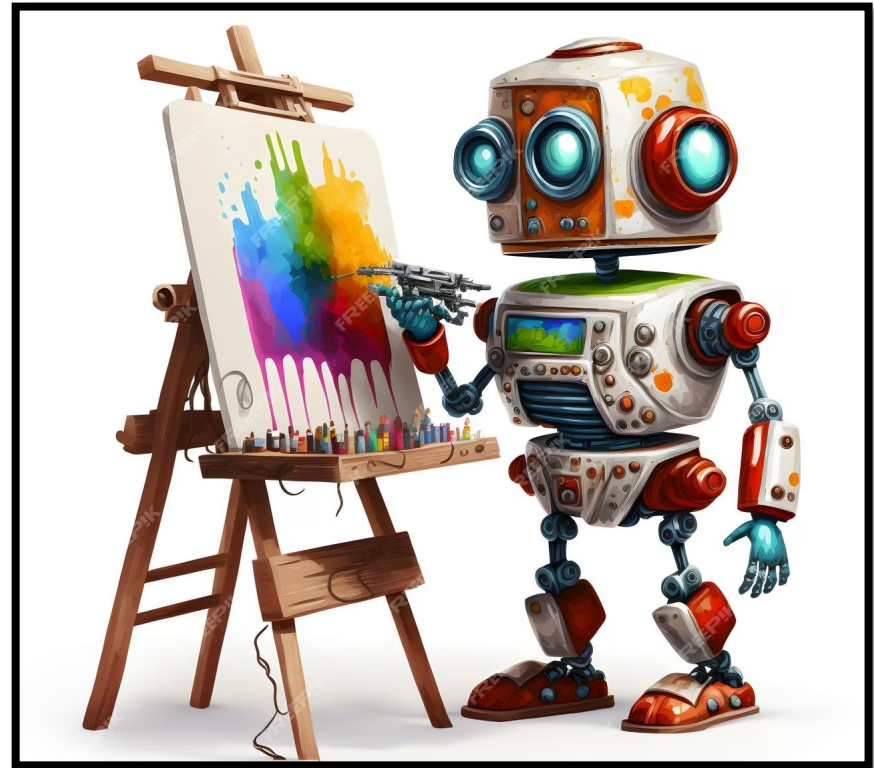
# Will a robot take my job?

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## Job Creation

On the other hand, the deployment of automation is historically a net job creator.

- Maintenance and Operations
- Development and Innovation
- New Industries

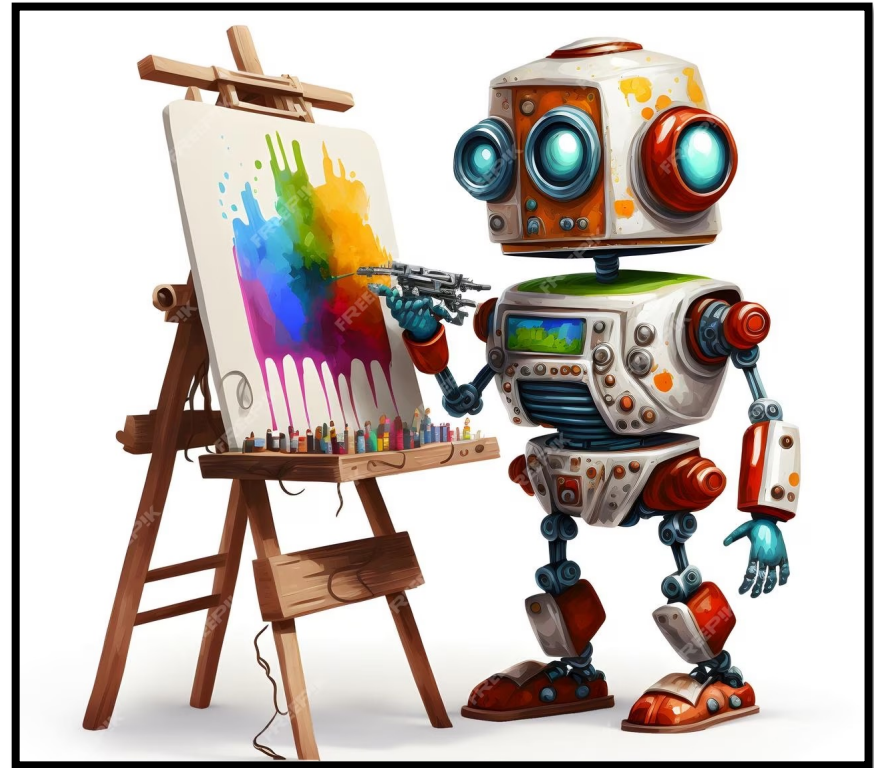


# Will a robot take my job?

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## Job Transformation

In many cases, automation transforms jobs rather than eliminates them. Workers may shift from performing routine, manual tasks to more more complex and value-added activities that require problem-solving, creativity and human judgement.

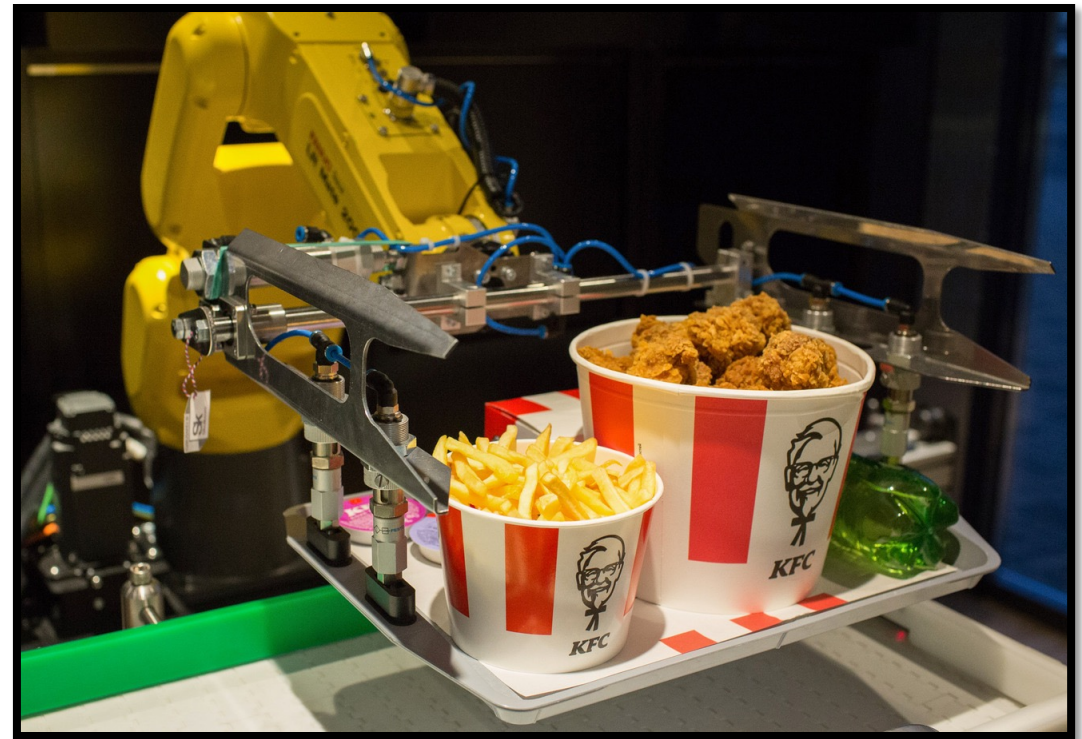


# Will a robot take my job?

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## Industry-Specific Impact

The impact of automation varies across industries and tasks. Tasks that involve routine, repetitive tasks are more susceptible to automation. Tasks that require creativity, emotional intelligence and complex decision-making are less likely to be fully automated.



# Will a robot take my job?

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## Complementary Roles

In many cases, automation technologies are designed to complement human work rather than replace it entirely. They can handle routine tasks, allowing humans to focus on more complex and strategic aspects of their jobs.



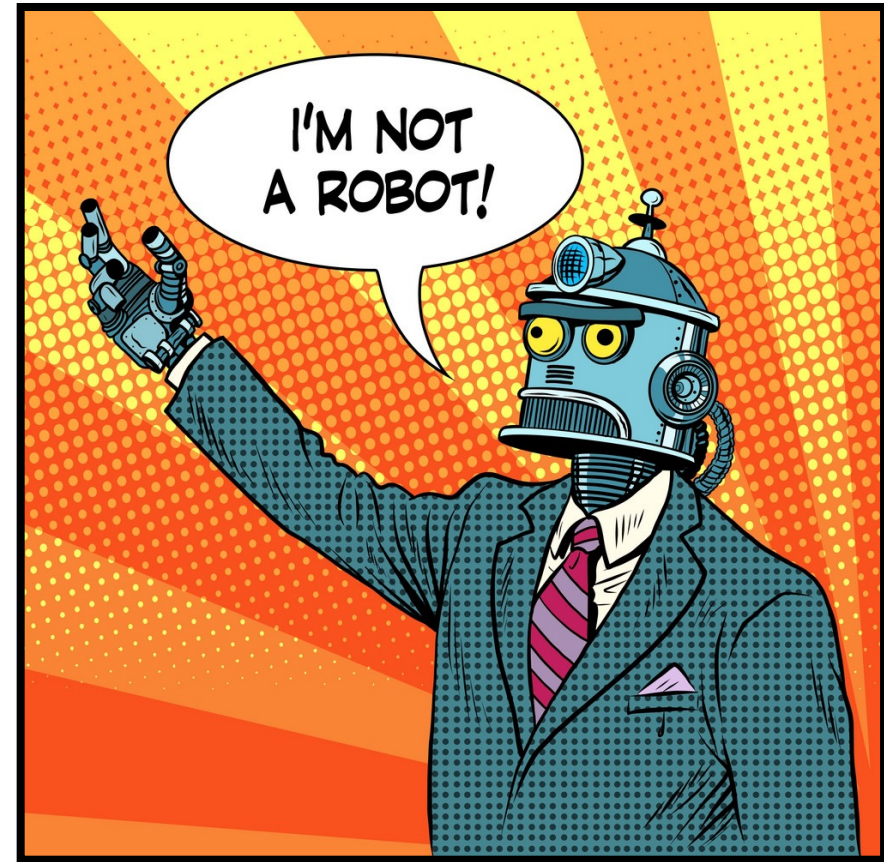


# Will a robot take my job?

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## Economic and Social Factors

The broader economic and social context also plays a role. Government policies, labor market dynamics and societal attitudes toward automation can influence how it affects employment.



# Will a robot take my job?

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## Reskilling and Education

To mitigate the negative effects of job displacement due to automation, there is an increasing emphasis on reskilling and upskilling workers to prepare them for new roles that align with the changing job landscape.



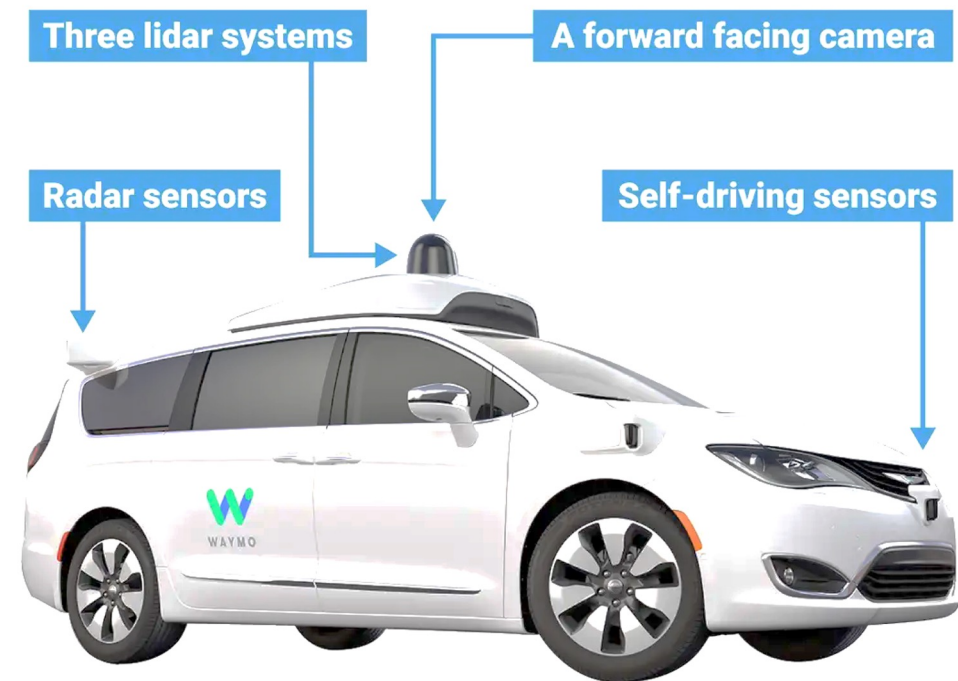
# Is it safe?

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According to Allstate, the typical driver is involved in an accident once every 165,000 miles in the US.

In Jan 2023, Waymo reported 1M rider-only miles.

- Only 2 collisions that met criteria for inclusion in NHTSA's CISS.
- 55% involved human drivers hitting stationary Waymo vehicles.
- Human drivers violated road rules and/or behaved dangerously in every vehicle-to-vehicle event.
- No reported injuries.



# Is it safe?

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4600 fatal accidents per year involving semi-trucks. With 112,000 injury crashes and 414,000 property damage-only crashes per year.

Trucks account for 4% of vehicles on the road but are involved in 9% of fatal crashes.

While cars are responsible for 80-90% of truck accidents, fatigue, distracted driving and speed are all significant contributors.





# Is it safe?

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***Would self-driving vehicles improve that safety record?***

***Do we think automation in the trucking industry is inevitable?***

***Is this impending automation driving a labor shortage in the trucking industry?***

# ChatGPT and “Artificial Intelligence”

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ChatGPT is a language model developed by OpenAI, based on the GPT (Generative Pre-trained Transformer) architecture. It is designed to generate human-like text responses in a conversational style. ChatGPT is trained on a large dataset of text from the internet and is capable of understanding and generating text in natural language, making it suitable for a wide range of natural language processing tasks, including chatbots, virtual assistants, and more.

(generated by ChatGPT)



# ChatGPT and “Artificial Intelligence”

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Currently WGA and SAG-AFTRA strikes are protesting the use of AI, among other things, on the basis that it supplants creative artists and writers.

The intro credits to Marvel Secret Invasion were notably AI generated by Method Studios for Marvel.

Jeff Simpson, Senior Concept Artist for Marvel Studios commented on this...



# ChatGPT and “Artificial Intelligence”

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**Jeff Simpson**

@jeffsimpsonkh



Secret Invasion intro is AI generated. I'm devastated, I believe AI to be unethical, dangerous and designed solely to eliminate artists careers.



# ChatGPT and “Artificial Intelligence”

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***Are AI models inherently unethical by using source material without attribution?***

***Does AI integration replace creativity or can it be used to support more complex creativity?***

# ChatGPT and “Artificial Intelligence”

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Ultimately, AI integration, much like CGI before it, has a far greater value as “tools” to augment current workers than to supplant them. Additionally, it has the ability to create opportunities for increased productivity without excessive pressure on the workers.

Streamlining data processing in areas such as:

- Customer service
- Software coding
- Marketing design



# ChatGPT and “Artificial Intelligence”

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***What can we do in education to encourage AI integration while maintaining creativity?***





# What happens if a robot takes my job?

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Historically, technological innovation has resulted in being a net job creator.

There is a likelihood of a lateral conversion to a new and better task.

Implementation of new technology takes time and allows for workers to acclimate and prepare for new roles.



# What happens if a robot takes my job?

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Many times jobs require retraining, upskilling and/or education.

- Tennessee Promise / Tennessee Reconnect
- Tuition Assistance
- In-house training programs
- Tennessee Worker Training Grants



# In Conclusion

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The net impact of automation in the workplace depends on how businesses, governments and society...

...adapt to these changes,

...invest in education and workforce development,

...and foster innovation in emerging industries.



# In Conclusion

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The future WILL involve continued advances in technology, but it is the uniquely human capacity to utilize these advances to their greatest potential for the betterment of humanity that will dictate what the future will look like.