# Algorithms

# In This Module

- What are algorithms and how do they work?
- How do algorithms shape our online experiences?
- What effects and issues do algorithms pose?
- What are some ways to mitigate the influences of algorithms?

# Algorithms

*An algorithm is a set of instructions that solve a problem or perform a task on a computer. Algorithms are a core aspect of coding and software development and can be found nearly everywhere online*

# Discussion

What comes to mind for you when you hear the term algorithm?

# How Do Algorithms Work?

We don’t exactly know how algorithms work on social media sites or major sites like Google. This is because their algorithms are proprietary to each business.

This poses challenges for researchers, regulators, and general users since we aren’t quite sure how the algorithms are working and why we are seeing what we see.

# How Do Algorithms Work?

Here's what we do know:

- Algorithms are code that provide a set of instruction for solving a problem or performing a task
- Algorithms are at the cornerstone of how the internet functions
- Algorithms can determine search results and which social media posts are trending

# How Do Algorithms Work?

Here's what we do know:

- Algorithms can make recommendations and decisions about everything from who will see what ad to who will be hired
- Algorithms help to personalize the online content that you see

# How Do Algorithms Work?

Here's what we do know:

- Algorithms are developed by humans. This means they can reflect human biases
- Algorithms work behind the scenes and can influence what we see without us fully realizing it
- Increasingly, algorithms are being used in AI and machine learning

# Where Can We See Algorithms at Work?

When it comes to **search engines:**

- Algorithms help determine which search results appear
- Algorithms determine the order in which search results appear
- Algorithms can also customize your search results for you

# Where Can We See Algorithms at Work?

When it comes to **recommendation engines:**

- Retailers use algorithms to suggest products to you based on your tracking data

And when it comes to **ads:**

- Advertisers use algorithms to target ads to you

# Where Can We See Algorithms at Work?

When it comes to **social media feeds:**

- Algorithms govern our social media feeds and determine what is popular or trending and what you see in your feeds

When it comes to **media sites:**

- Netflix, YouTube, and other places use algorithms to recommend videos to you and to show you “trending” content

# Where Can We See Algorithms at Work?

Voice recognition tools use algorithm to respond to you. Examples include:

- Alexa
- Siri

# Where Can We See Algorithms at Work?

Map applications use algorithms to show you live traffic data. Examples include:

- Google Maps
- Apple Maps
- GPS Maps

# Where Can We See Algorithms at Work?

Employment application systems governed by algorithms are increasingly used by employers  to screen applications.

Facial recognition software uses algorithms to function. They continue to be a space particularly prone to bias and discriminiation.

*What else comes to mind for you?*

# Benefits of Algorithms

- Algorithms can make decisions or perform tasks much quicker than the average human, such as complex calculations
- Algorithms are increasingly used in safety features, such as in cars
- Algorithms can often show us relevant and helpful information quickly

# Issues Posed by Algorithms

Algorithms can reflect human biases and there are increasing numbers of examples that show how algorithms can go awry.

Qualified candidates can be rejected from a job pool by an algorithm, or sentencing decisions in criminal decisions can be much harsher for certain groups thanks to an algorithm.

# Issues Posed by Algorithms

Algorithms encourage endless scrolling on social media platform by constantly churning out new content and recommendations.

Search engines and social media sites often try to show us popular content or relevant content. But this can backfire when we end up getting stuck in a filter bubble, where we only see certain kinds of content.

# Discussion

How do you feel about algorithms? What concerns do you have? Are there aspects of algorithms that you find exciting or positive?

# Interactions With Algorithms

Algorithms can be difficult to avoid. But being aware of and mindful of the impacts algorithms can have is a key aspect of digital security best practices.

# Interactions With Algorithms

Break out of echo chambers by:

- Seeking out different kinds of information
- Being thoughtful about what you see online
- Avoiding only relying on recommendations for news and information
- Taking advantages of resources at your local library

# Reducing the Impact of Algorithms

Adjust your relationship to algorithmic activity by adjusting how you see results on social media sites:

- Check your sites for options on how to display your feed
- Where possible, turn off “trending” content in favor of displaying recent posts

# Reducing the Impact of Algorithms

Turn off recommendations and alerts and limit screen time. Remember that social use algorithms to keep you on the platform.

Limit your time and these platforms and limit how and when you gets alerts.

# Reducing the Impact of Algorithms

Algorithms rely on your data to work and deliver you personalized content.

Manage your privacy settings and practice data minimization to avoid giving more data to algorithms that, for instance, help run targeted ads.

# Activity

Use the handout provided to test how algorithms work

# Takeaways

- Algorithms are increasingly everywhere and have major impacts on our online experiences and what we see and hear online
- Algorithms can be at work without us fully realizing it. They can reflect human biases and can cause real and serious issues for society at large
- There are strategies you can deploy to manage the influence algorithms have on you

# Resources

*Algorithms of Oppression* by Safiya Noble (link)

*Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* by Cathy O'Neil (link)

"Code-Dependent: Pros and Cons of the Algorithm Age" from Pew Research Center (link)

"Algorithms and Society" from PBS Learning Media (link)

# Questions?

# NYC Digital Safety

## Privacy & Security