

# Sensory Modalities and Deepfakes:

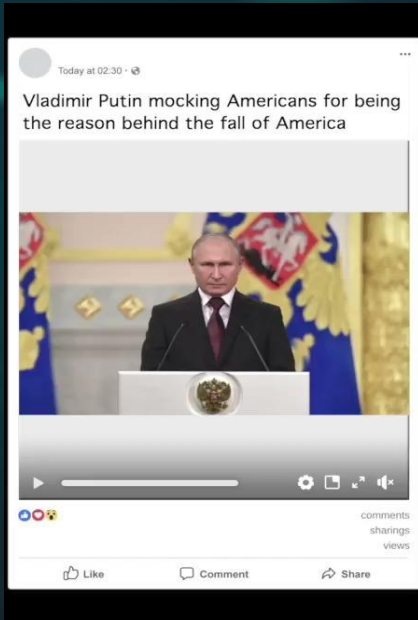
Examining Users' Credibility Evaluations and Sharing  
Intention of Different Forms of Political Deepfakes

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# Introduction

**Deepfakes:** an audio-visual (AV) manipulation in audio & videos through AI to mimic human bodies and faces (Paris & Donovan, 2019) with highly convincing 'realism heuristics' (Ahmed, 2021a; Vaccari & Chadwick, 2020).



From RepresentUS

**Cheapfakes:** manipulation of AV in videos via cheap software, resulting in dissonant AV elements (Paris & Donovan, 2019).



**Audio Deepfakes:** Deepfakes without the video component; purely audio clips only



# Why is this a concern?



Individual

People only perform **slightly above chance in the evaluation** of a deceptive message as true or not (Bond & DePaulo, 2006) - even **high cognitive individuals fall for and share deepfakes**, especially in the absence of informational cues (Ahmed, 2021).

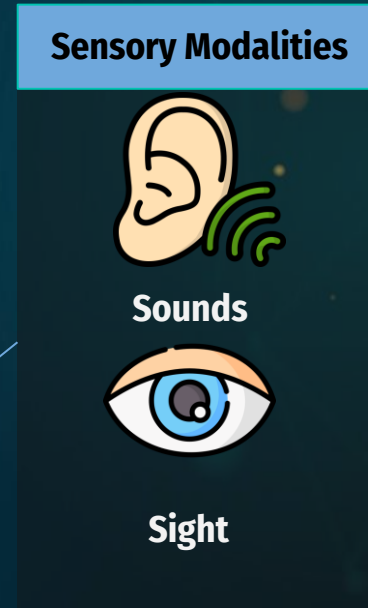


Society & Democracy

The pernicious impacts from the spread of misinformation influence us directly by **increasing polarization** (Ribeiro et al., 2017) and indirectly where one's presumed influence of political misinformation on others **reduces self-satisfaction with democracy** (Nisbet et al., 2021).

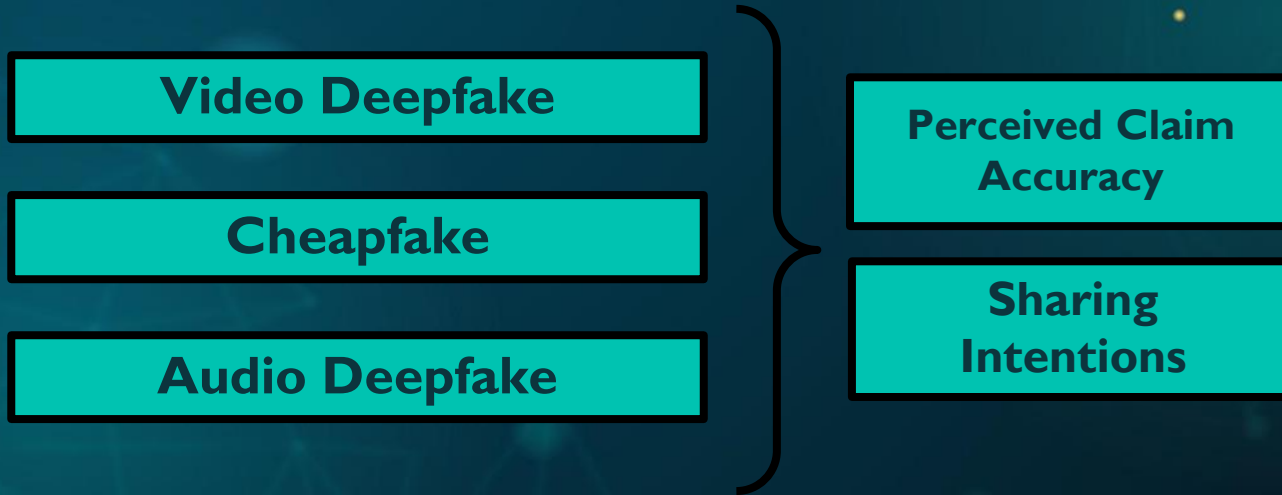
**Sows uncertainty** in online users and reduces their trust in news on social media, leading to **generalized indeterminacy and cynicism** (Vaccari & Chadwick, 2020).

# What role does sensory modality play?



- Users **encode modality-specific content** when processing information and multiple modalities can **interact to influence** users' perceived claim accuracy (Unnava et al., 1994).
- **Dissonant audio-visual elements** induce a higher user cognitive load, resulting in **lower believability** (Grimes, 1991).

# Research Framework



# Research Hypotheses & Question(s):

H1:



People are **more likely to perceive the claims** in video deepfakes to be true as compared to cheap fakes and audio deepfakes.

RQ:



Are individuals **more likely to share** video deepfakes as compared to cheapfakes and audio deepfakes?

H2:



High cognitive individuals are **less likely to believe and share video deepfakes**, cheapfakes, and audio deepfakes.

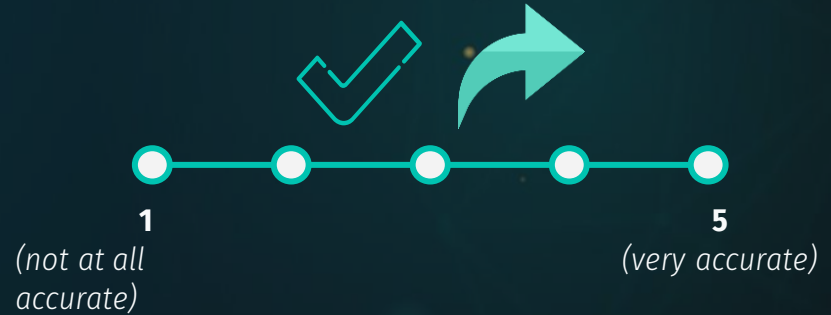
# Measures

## Perceived Claim Accuracy

*"Did Vladimir Putin mock Americans for being the reason behind the fall of America?"*

## Sharing Intentions

*"How likely are you to share this on your social media?"*



## Cognitive Ability

### *Word Sum Test*

Participants need to match the source word to the closely associated word from a target list of five words.



## Demographics & Political Interest

*Age, Education, Income, Education, Political Motivations, Partisanship*

These are used as controls.





# Methodology

A total of **306 participants** were recruited through a survey (Qualtrics) via a quota sampling strategy. The **sample frame** was matched to population parameters of age and gender for greater representativeness of findings.



**US Citizens**



**Majority had a Bachelor's Degree**



**53% Male**



**73% White**



**Mean = 46**

**Survey Experiment**

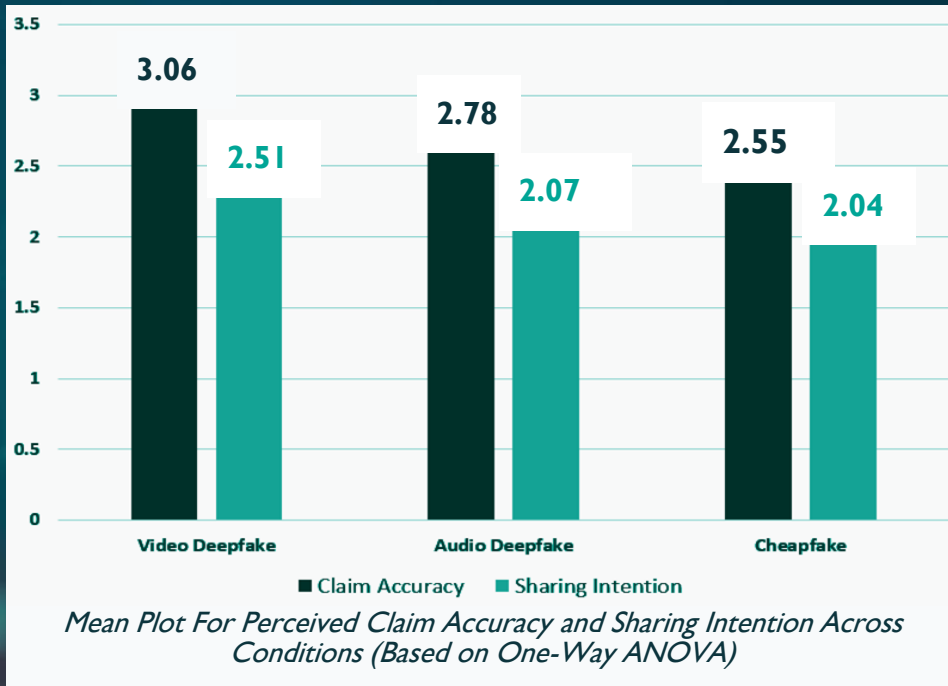


**Between-Group Study Design:** Participants are randomly assigned to one of the three disinformation conditions: a) video deepfake, b) video cheapfake and c) audio deepfake. They then proceed to answer questions regarding their perceived accuracy of the claims and sharing intention of the disinformation. No differences between groups were found.



# Results

To compare the differences between conditions for perceived claim accuracy, we ran a **one-way ANOVA**.



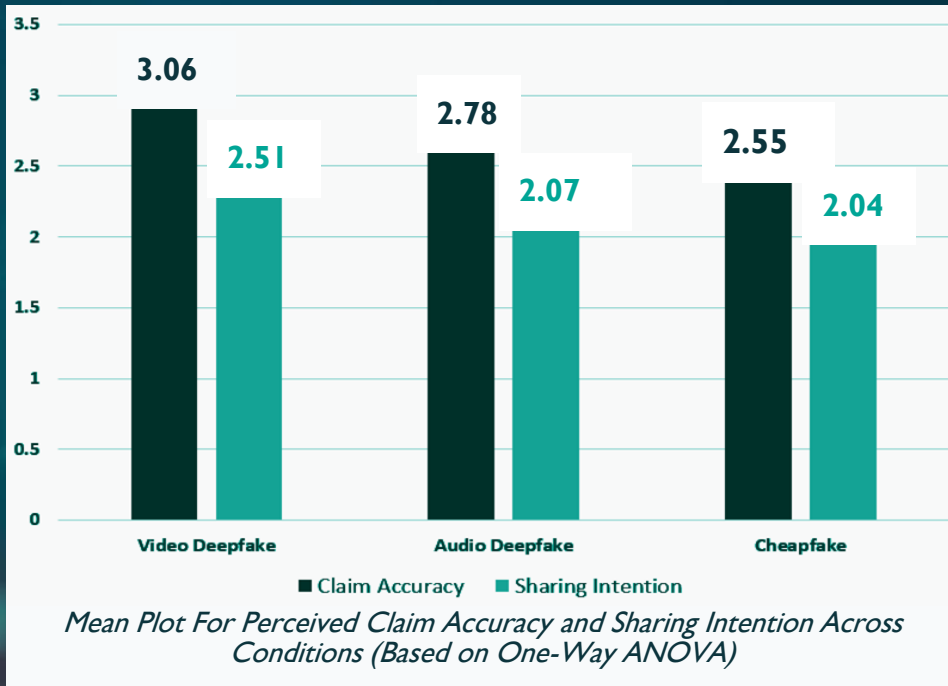
There was a **significant effect** of conditions on perceived claim accuracy [ $F(2, 298) = 3.37, p < .05$ ].

Individuals were **more likely to perceive the deepfake** ( $M = 3.06, SE = .13$ ) **to be more accurate than the cheap fake**, but not the audio-deepfake ( $M = 2.77, SE = .14, p = .14$ ).

**HI is supported.** ✓

# Results

To compare the differences between conditions for sharing intentions, we ran a **one-way ANOVA**.



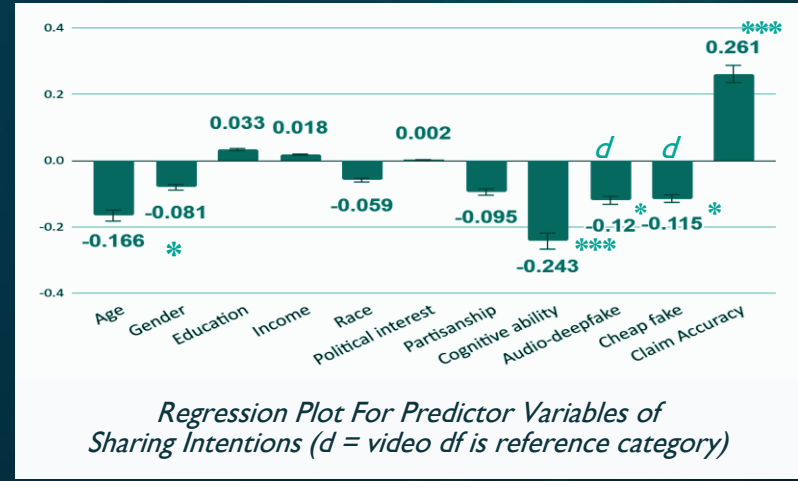
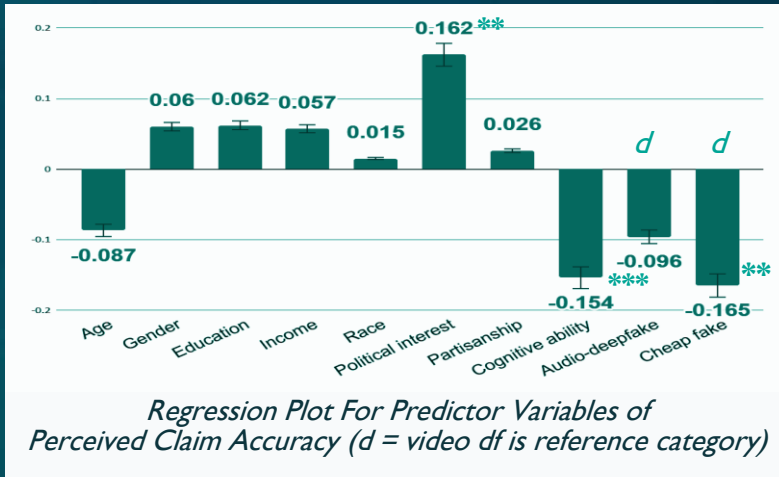
There was a **significant effect** of conditions on sharing intention [ $F(2, 298) = 4.34, p < .05$ ].

Those who watched the **video deepfake** ( $M = 2.51, SE = .13$ ) **were more likely to share it than audio deepfakes** ( $M = 2.07, SE = .13, p < .05$ ) **and cheap fakes** ( $M = 2.04, SE = .12, p < .001$ ).

**H2 is supported.** ✓

# Results

Next, we tested the role of cognitive ability in perceived claim accuracy and sharing intention through **linear regression**. Two models were constructed with perceived claim accuracy and sharing intentions as variables.



We also observed the **main effects of cognitive ability** ( $F = 25.62, p < .001$ ). Individuals with **high cognitive ability** are **less likely** to perceive the claims to be accurate (claim:  $\beta = .154, p < .001$ ) and share them on social media (sharing:  $\beta = -.243, p < .001$ ).

We also found that **perceived claim accuracy is positively associated with sharing intention** ( $\beta = .261, p < .001$ ), thereby suggesting that across audio-visual formats, individuals are more likely to share disinformation if they believe it to be true.

# General Discussion

**1** Individuals are **more likely to perceive video deepfakes as more accurate** than cheapfakes but not audio deepfakes, once again emphasizes and reinforces the deceptive notion of deepfakes.



## Realism Heuristics:

- Familiarity breed 'truthiness effect' (Newman et al., 2015)
- People are more likely to accept information as true if they perceive it as familiar

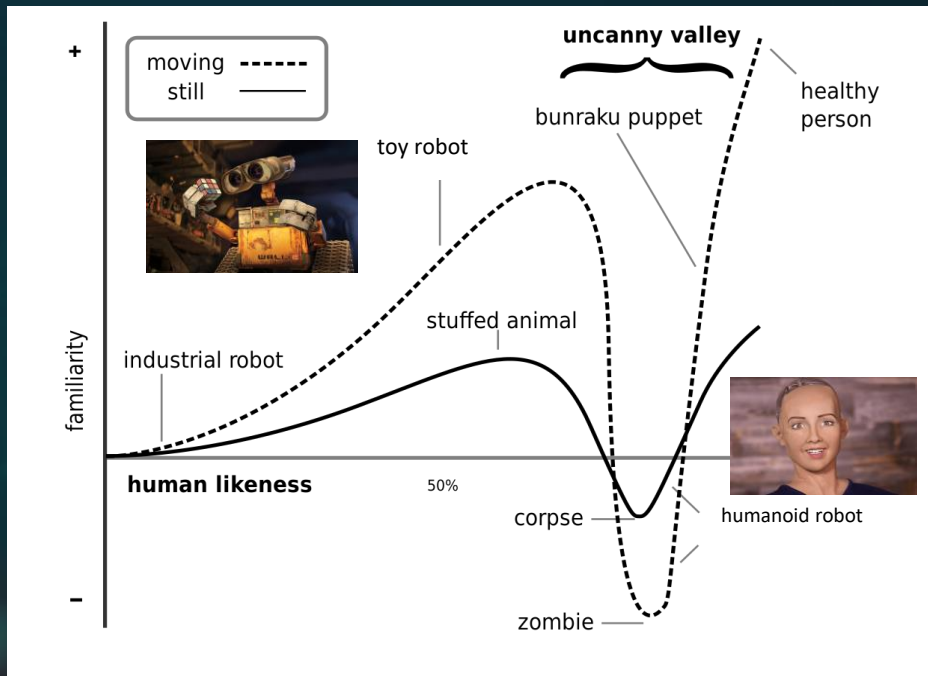
However...

**Why isn't deepfakes and cheapfakes perceived as more accurate than audio deepfakes?**



- Picture superiority effect (Nelson et al., 1976)

# General Discussion



## Uncanny Valley Theory:

a curvilinear depression in the graphic representation of the function that describes people's ratings of affinity for artificial humans (digital or physical) as their likeness approaches high fidelity

More cognitive dissonance experienced watching cheapfakes > deepfakes, hence, higher levels of antipathy watching cheapfakes than deepfakes.

(Ferrey et al., 2015)

# General Discussion

2

Individuals are **more likely to share video deepfakes** as compared to video cheapfakes and audio deepfakes.

**Heuristic Systematic Model (HSM)** of information processing (Eagly & Chaiken, 1993; Todorov et al., 2003).

- Influence one's behavioural intentions, leading to sharing of deepfakes on the net (Powell, 2015).

**Novelty attracts attention** (Itti & Baldi, 2009)

- False news diffuse faster than truth due to novelty (Vosoughi et al., 2018).

**Information theory & Bayesian decision theory**

- Aids productive decision-making (Aral & Alstynne, 2011)
- Social perspective: having 'insider' information (Berger & Milkman, 2012).

However, even though people are equally likely to perceive video deepfake & audio deepfake to be true than cheapfake, this is not replicated in our results for sharing intentions.

- Need to consider other factors; deepfakes is not monolithic.

# General Discussion

3

High cognitive individuals are less likely to believe and share deepfakes.

- **Better decision-making** processes (Lodge & Hamill, 1986)
- **Higher elaborative processing** and better at truth discernment (Pennycook & Rand, 2018).
- Likelier for **heightened suspicion and resistance** to occur → negatively influencing one's attitude & behavioural intent (Nathaniel & Park, 2015).

4

Individuals with high political interest are positively associated with perceived claim accuracy.

- **Motivated reasoning:** (Bolsen et al., 2014)
  - Partisanship plays a critical role in maintaining one's disposition despite evidence pointing otherwise (Bisgaard, 2015).



# Implications



## Theoretical:

- Provide empirical evidence that scholars should not use a single lens when studying deepfakes as citizen engagement can differ across forms of deepfakes.



## Practical:

- Social media companies should enable users to know of the dangers of deepfakes and to not rely upon sensory modalities, but instead take active steps via fact-checking.
- Encourage policy makers to safeguard the more vulnerable section of society (i.e. low cognitive users) against disinformation (i.e. including informational cues).

# Limitations & Future Direction(s):

- Usage of political deepfakes in survey:
  - Types of deepfake used may influenced one's perceived claim accuracy & sharing intentions
  - Findings may not be generalizable to all contexts.
- This study was conducted in the US; may not be generalizable across contexts.

# Acknowledgements

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**Thank You!**

# OUR EVOLUTION

Jupiter is a gas giant and  
the biggest planet

**2005**

**2010**

Saturn is composed of  
hydrogen and helium

Mercury is the closest  
planet to the Sun

**2015**

**2020**

Despite being red, Mars is  
a cold place

# NAME OF YOUR SECTION

# 01

---

You could enter a  
subtitle here if you need  
it

# WHAT DO WE DO?



Mercury is the smallest planet in our Solar System



Venus has a beautiful name, but it's terribly hot



Jupiter is the biggest planet in our Solar System



Saturn is composed of hydrogen and helium



# HOW DO WE DO IT?

## MERCURY

Mercury is the smallest planet in our Solar System



## VENUS

Venus has a beautiful name, but it's terribly hot

## SATURN

Saturn is composed of hydrogen and helium

# WHAT DO WE OFFER?

01	02	03	04
Mercury is the smallest planet in our Solar System	Jupiter is the biggest planet in our Solar System	Venus has a beautiful name, but it's terribly hot	Saturn is composed of hydrogen and helium

# OUR CLIENTS

Mercury is the smallest planet in our Solar System

**MERCURY**



**JUPITER**

Jupiter is the biggest planet in our Solar System



Venus has a beautiful name, but it's terribly hot

**VENUS**



**SATURN**

Saturn is composed of hydrogen and helium



# WHAT DO THEY SAY ABOUT US?

Despite being red, Mars is actually a cold place

**MARS**

Venus has a beautiful name, but it's terribly hot

**VENUS**

Mercury is the closest planet to the Sun

**MERCURY**

Neptune is the farthest planet from the Sun

**NEPTUNE**

Saturn is composed of hydrogen and helium

**SATURN**

Jupiter is the biggest planet in our Solar System

**JUPITER**

# CASE STUDIES

Venus is the second planet from the Sun

## VENUS

Saturn is the ringed planet and a gas giant

## SATURN



## MARS

Despite being red, Mars is actually a cold place



## MERCURY


Mercury is the closest planet to the Sun



## NEPTUNE

Neptune is the farthest planet from the Sun





**AWESOME  
WORDS**





**A PICTURE  
ALWAYS  
REINFORCES  
THE CONCEPT**





**333,000,000+**

connectors has the most complex AI prototype

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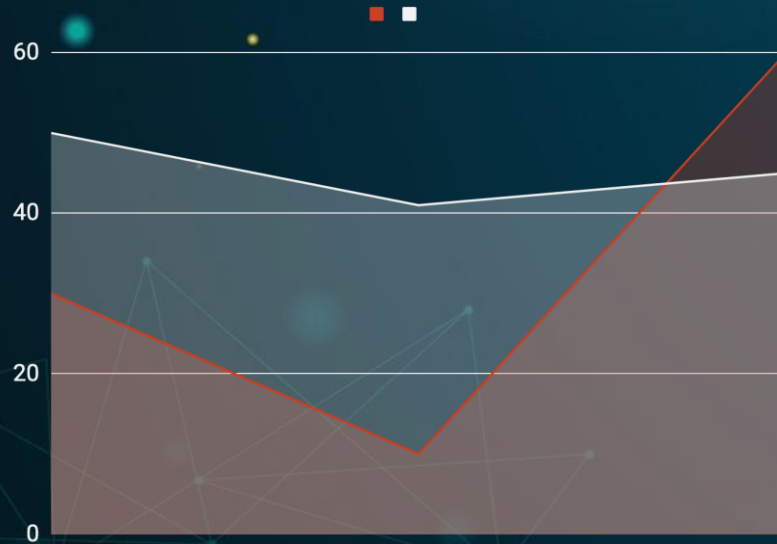
**30%**

Despite being red, Mars is actually cold

**70%**

Mercury is the closest planet to the Sun

# OUR GROWTH



If you want to modify this graph, click on it, follow the link, change the data and replace it here



Jupiter is a gas giant and the biggest planet

Mercury is the closest planet to the Sun

# OUR PROGRESS



## NEPTUNE

Neptune is the farthest planet from the Sun



## VENUS

Venus is the second planet from the Sun



## MERCURY

Mercury is the closest planet to the Sun



## MARS

Despite being red, Mars is actually a cold place

# MEET THE TEAM



**JENNA DOE**

You can replace the image on the screen with your own



**JAMES PATTERSON**

You can replace the image on the screen with your own

# SOFTWARE DESKTOP



Mercury is the closest planet to the Sun and the smallest one in the Solar System—it's only a bit larger than our Moon

# MOBILE APP

Venus has a beautiful name and is the second planet from the Sun. It's terribly hot and its atmosphere is extremely poisonous





# THANKS!

Do you have any questions?

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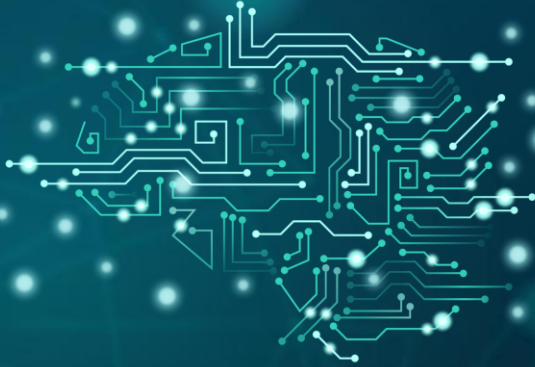
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# RESOURCES

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- Artificial intelligence

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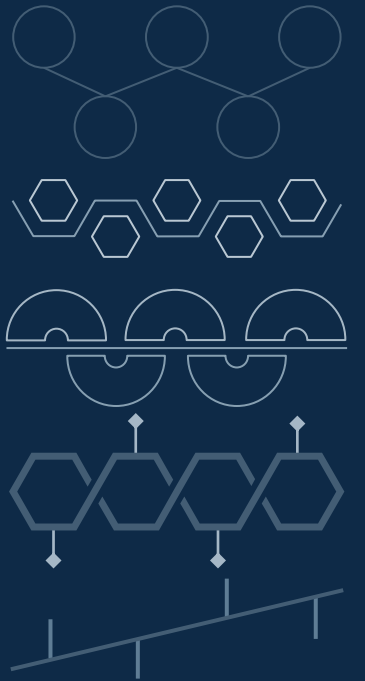
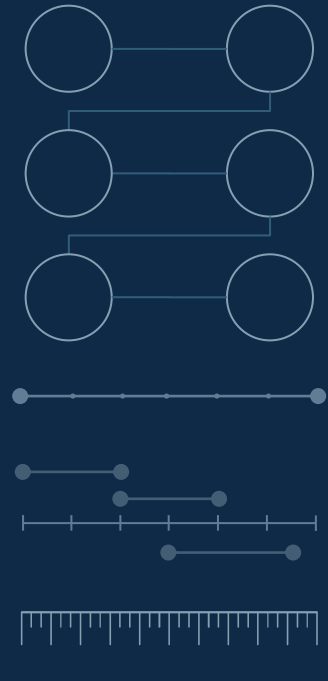
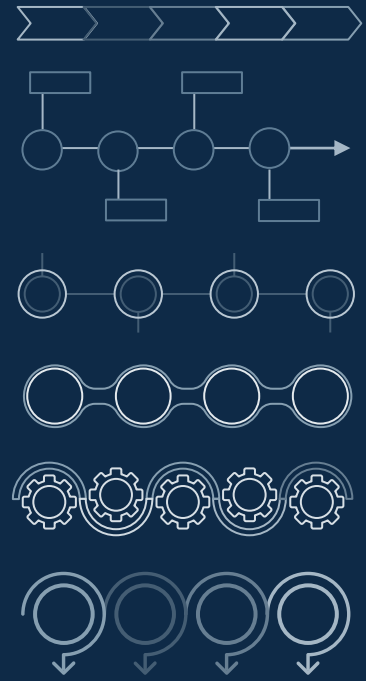
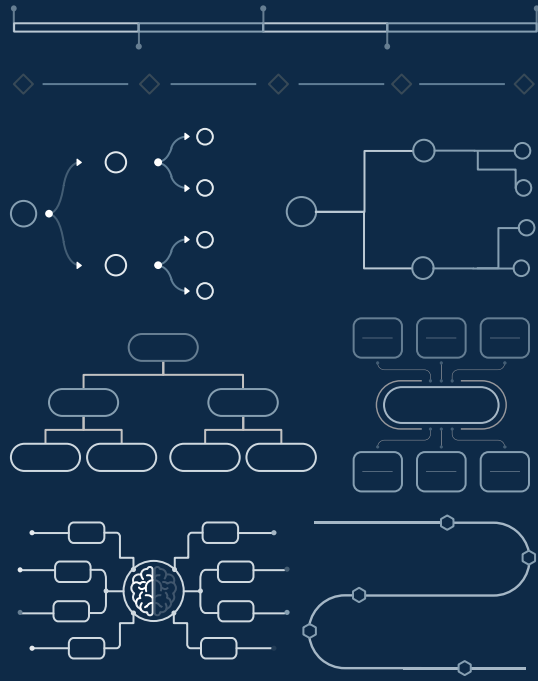
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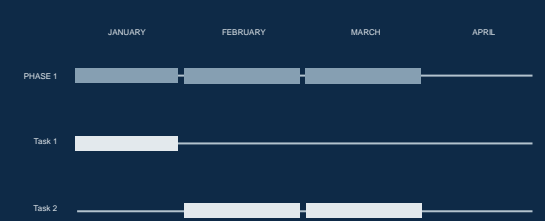
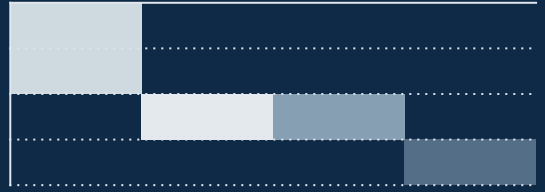
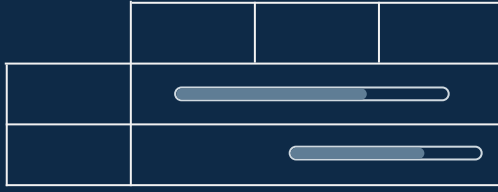
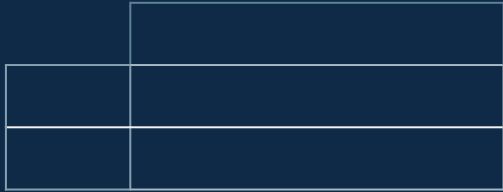
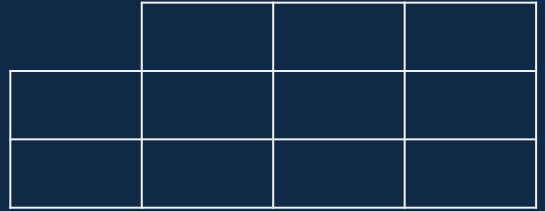
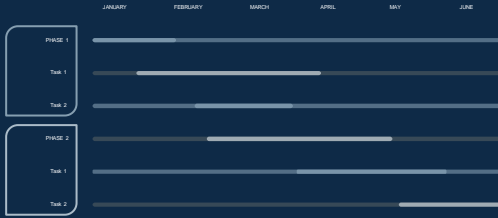
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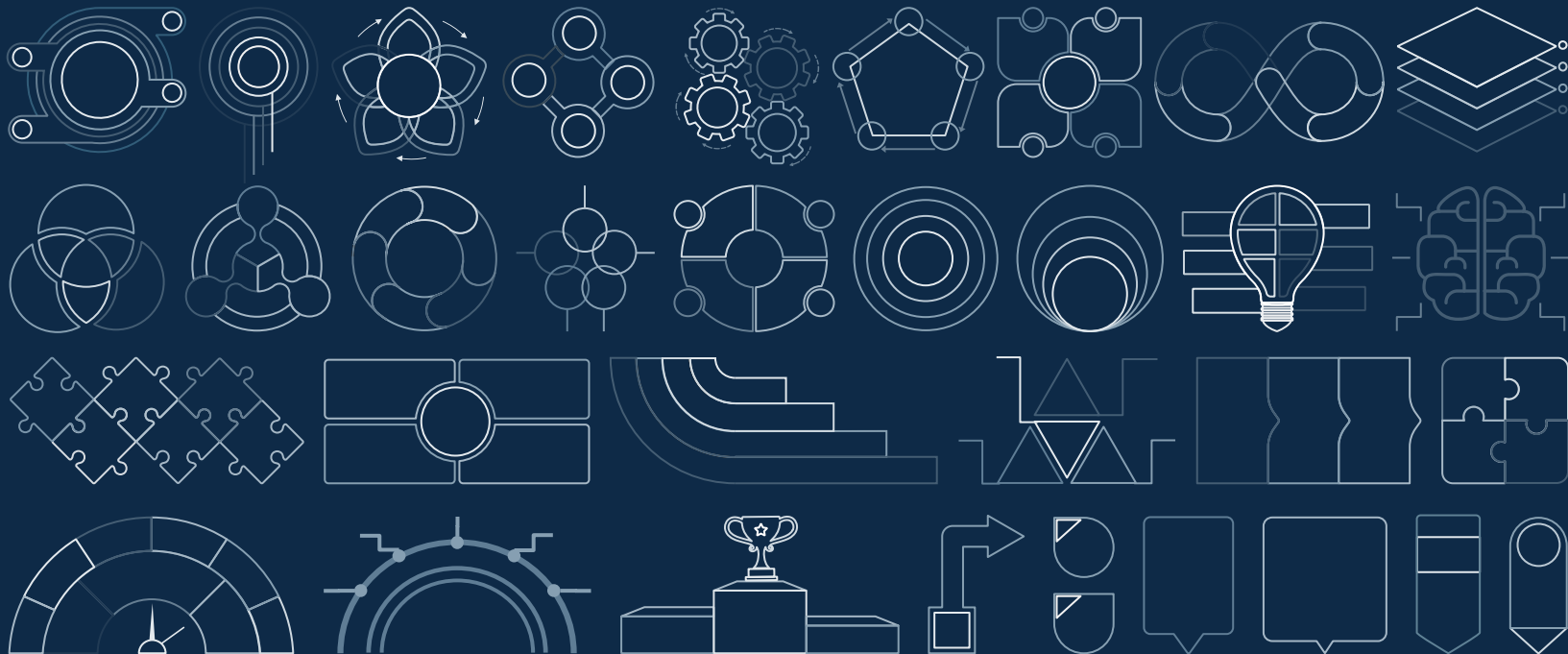


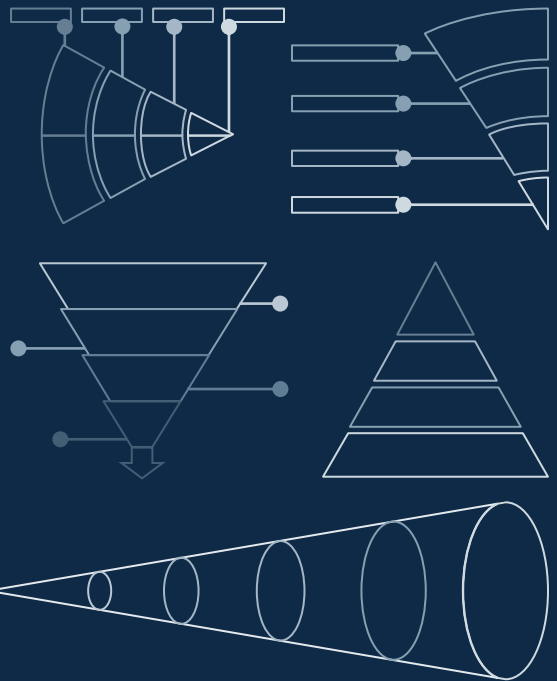
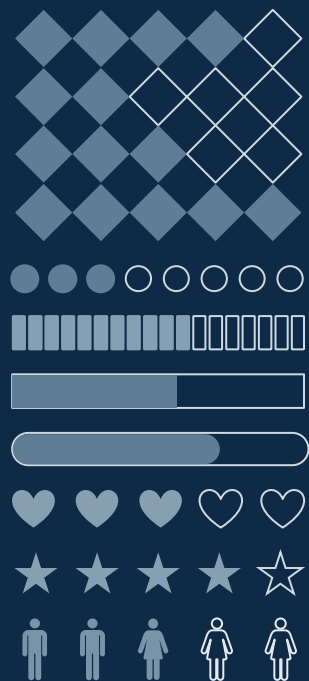
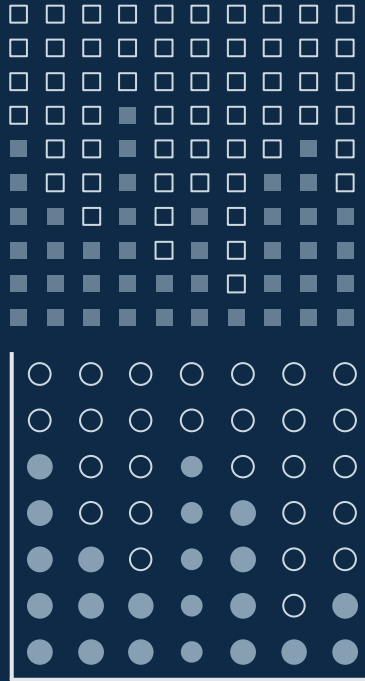












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