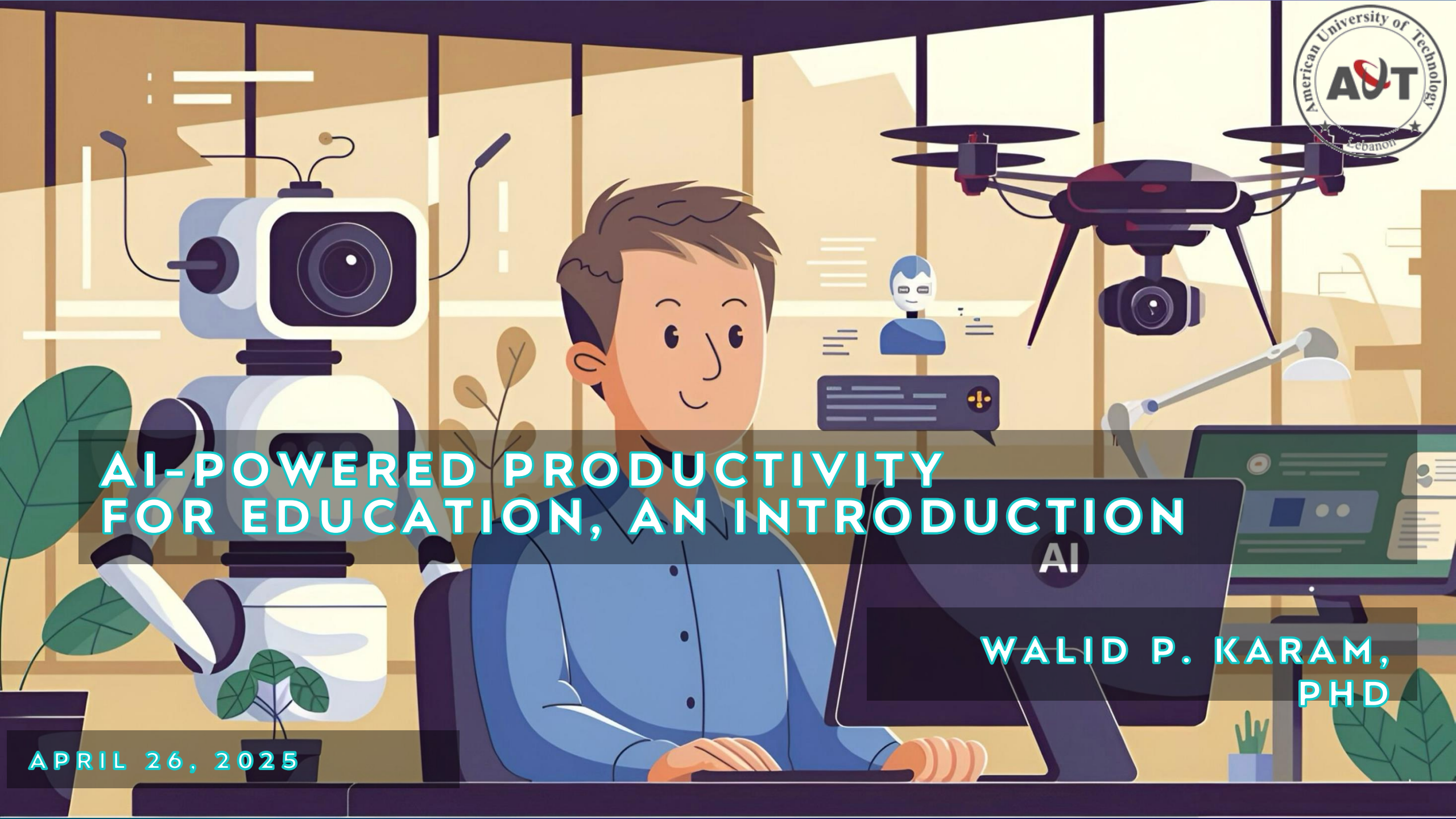
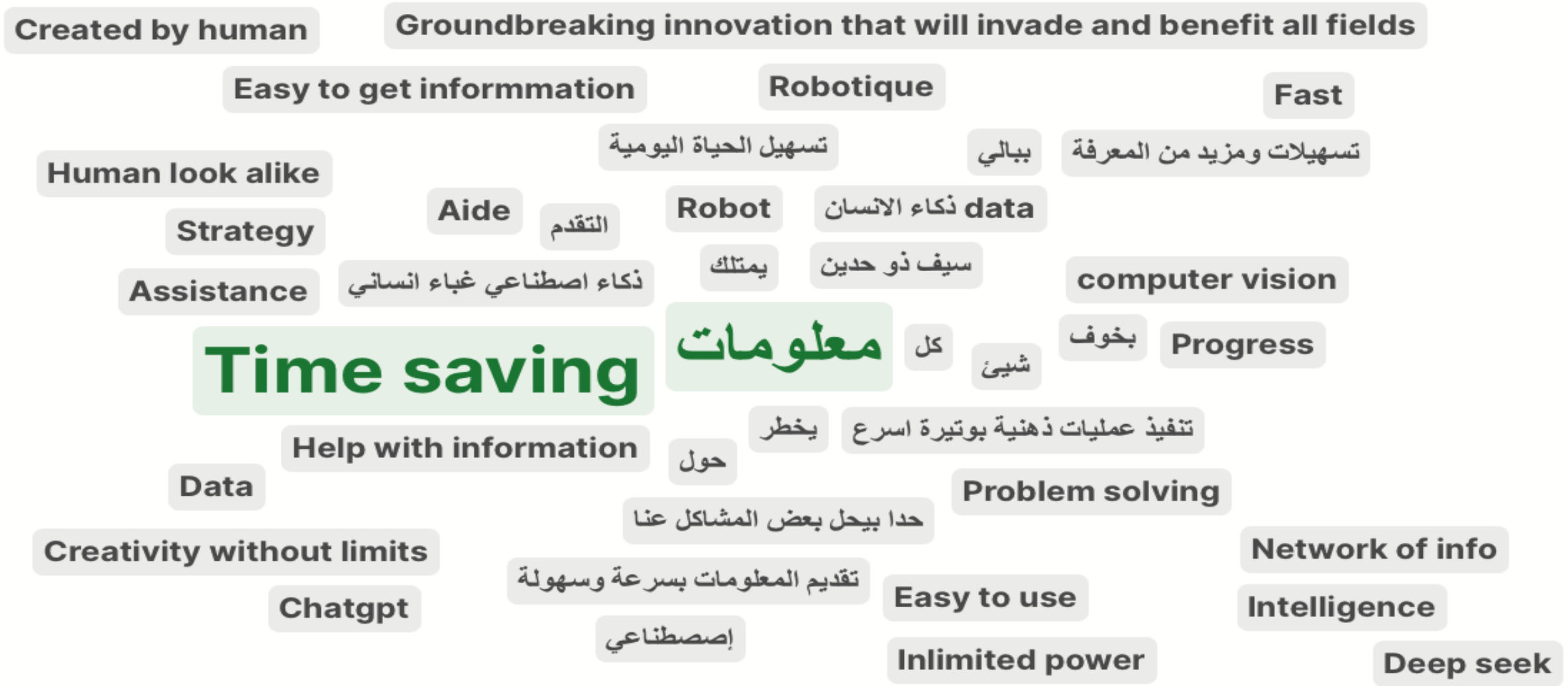


AI-POWERED PRODUCTIVITY FOR EDUCATION, AN INTRODUCTION

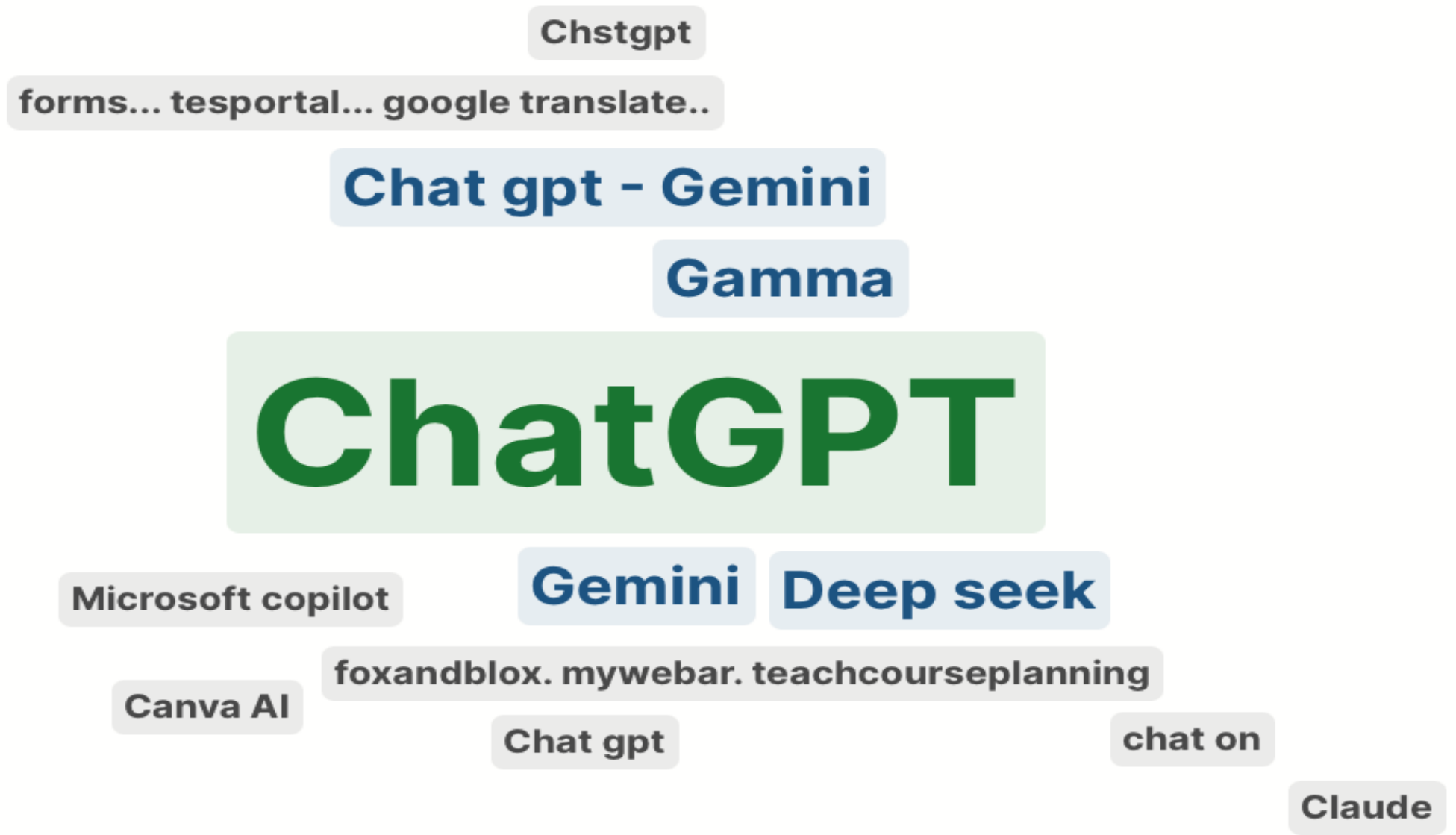
WALID P. KARAM, PHD

APRIL 26, 2025

What is the first thought that comes to your mind when you think of AI?
شو أول فكرة بتجي على بالك لما بتفكر بالذكاء الاصطناعي؟



Which AI tools do you use or are familiar with?
شو أدوات الذكاء الاصطناعي يللي بتستعملها أو معوّد عليها



WHAT IS AI?

Artificial Intelligence, a branch of computer science concerned with creating intelligent machines capable of mimicking human cognitive functions such as learning and problem-solving.

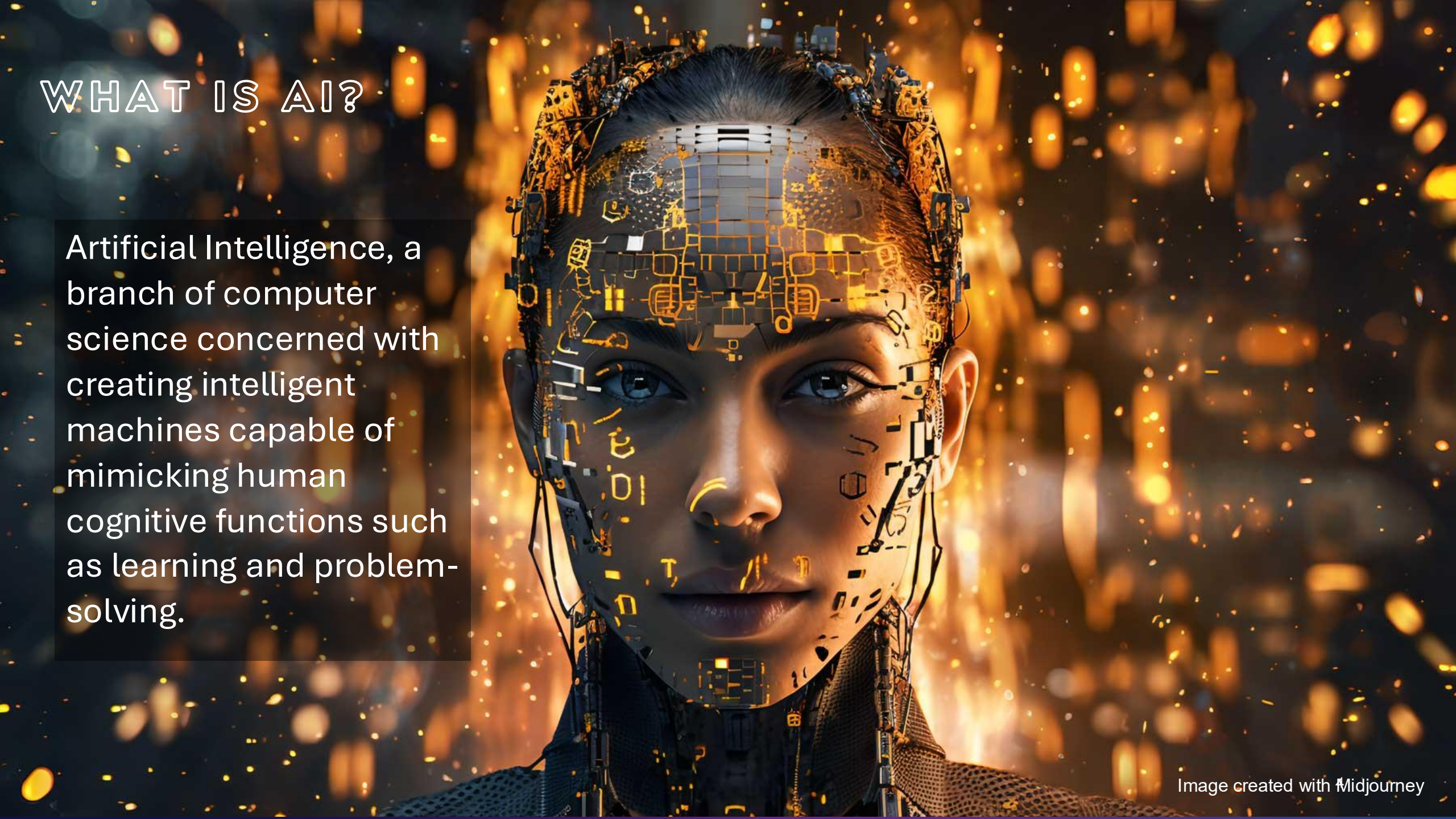


Image created with Midjourney

THREE TYPES OF AI

- narrow or weak AI
- general or strong AI
- super AI

Image created with ideogram

NARROW OR WEAK AI (ANI)

- image recognition
- Speech recognition
- AI Chatbots

- Siri, Alexa
- Autonomous Vehicles
- Playing Games (Chess)

IBM Watson

- Machines can perform a specific limited task
- Fixed domain models provided by programmers
- Learns from thousands of labeled examples
- Reflexive tasks with no understanding
- Knowledge does not transfer to other domains or tasks

Image created with Midjourney

GENERAL OR STRONG AI (AGI)

- Cognitive tasks
- Creativity, emotions
- Common sense

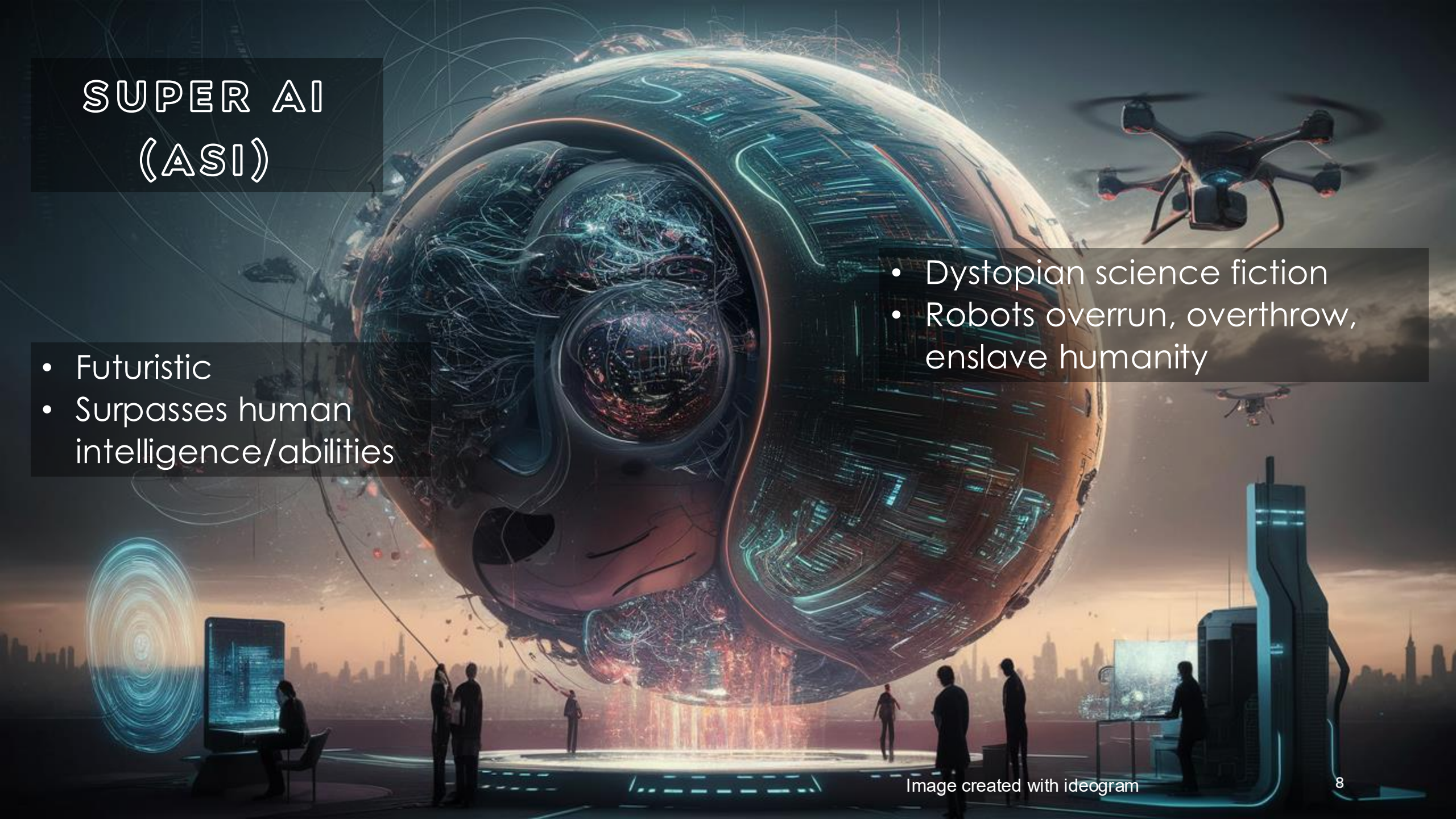
- Ability to learn, generalize, apply knowledge, plan
- Self-aware consciousness

Image created with Midjourney

SUPER AI (ASI)

- Futuristic
- Surpasses human intelligence/abilities

- Dystopian science fiction
- Robots overrun, overthrow, enslave humanity



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3 Types of Artificial Intelligence

Artificial Narrow Intelligence (ANI)

Stage-1

Machine Learning

- Specialises in one area and solves one problem

Siri

Alexa

Cortana

Artificial General Intelligence (AGI)

Stage-2

Machine Intelligence

- Refers to a computer that is as smart as a human across the board

Artificial Super Intelligence (ASI)

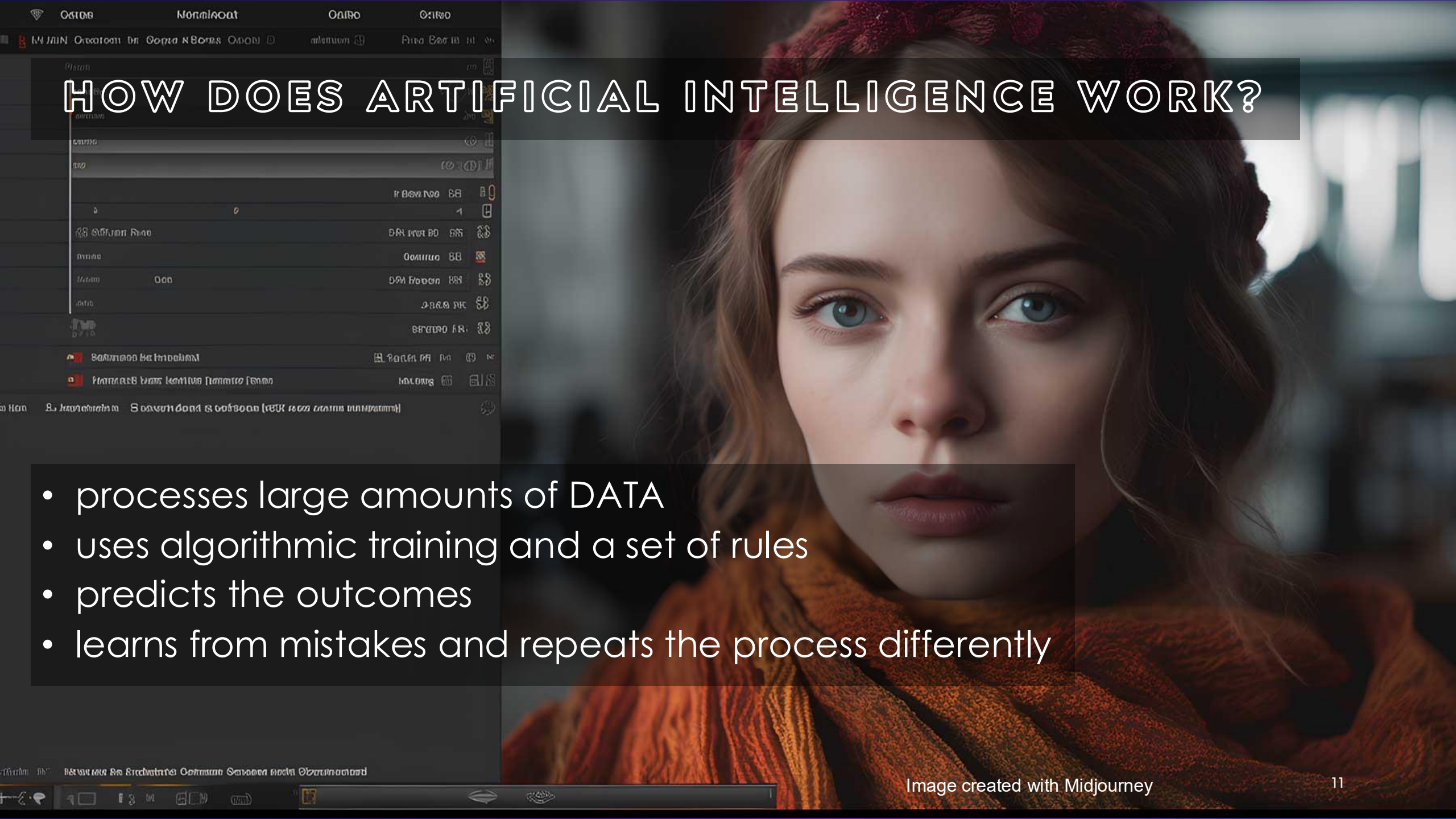
Stage-3

Machine Consciousness

- An intellect that is much smarter than the best human brains in practically every field

ECONOMIC
POLITICAL
SOCIETAL
SCIENCE
ETHICS
TECHNOLOGY
Smart Grid
Connected Car
Smart Homes
Artificial Narrow Intelligence
Smart Cities
Connected Healthcare
Next Generation Education
Sharing (Access) Economy
Automation of Everything
Cyberwar
Autonomous Vehicles
Healthy Life Extension
Sports 2.0
Energy Internet
Maker Economy
Money 2.0
Circular Economy
Artificial General Intelligence
Institution 2.0
Transport 2.0
Logistics Internet
Empowerment Economy
Decentralization of Everything
Food 2.0
Work 2.0
Democracy 2.0
Human-Machine Convergence
Human 2.0
Artificial Super Intelligence
Space Colonization
De-Extinction
Radical Life Extension

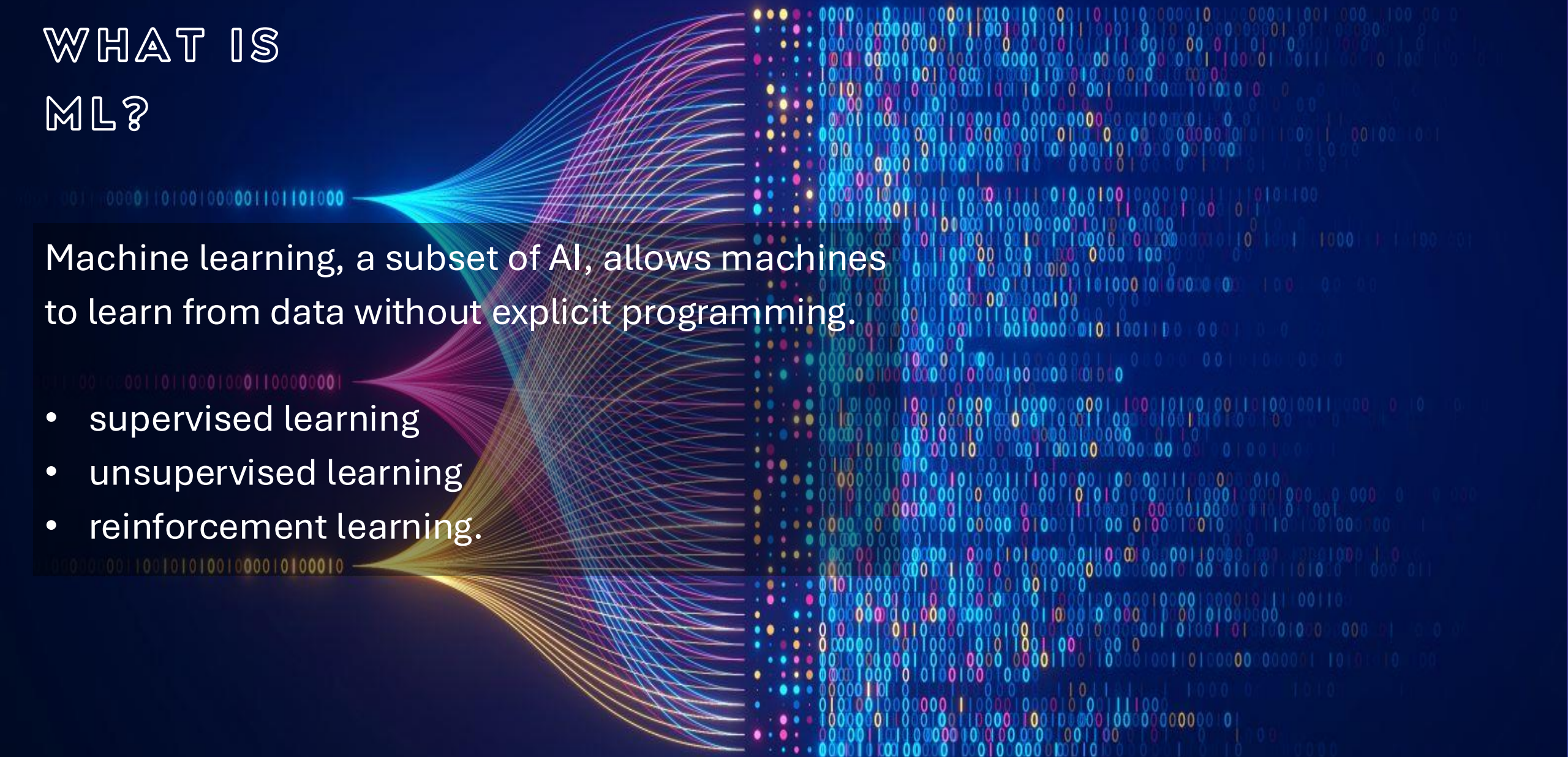
HOW DOES ARTIFICIAL INTELLIGENCE WORK?



- processes large amounts of DATA
- uses algorithmic training and a set of rules
- predicts the outcomes
- learns from mistakes and repeats the process differently

Image created with Midjourney

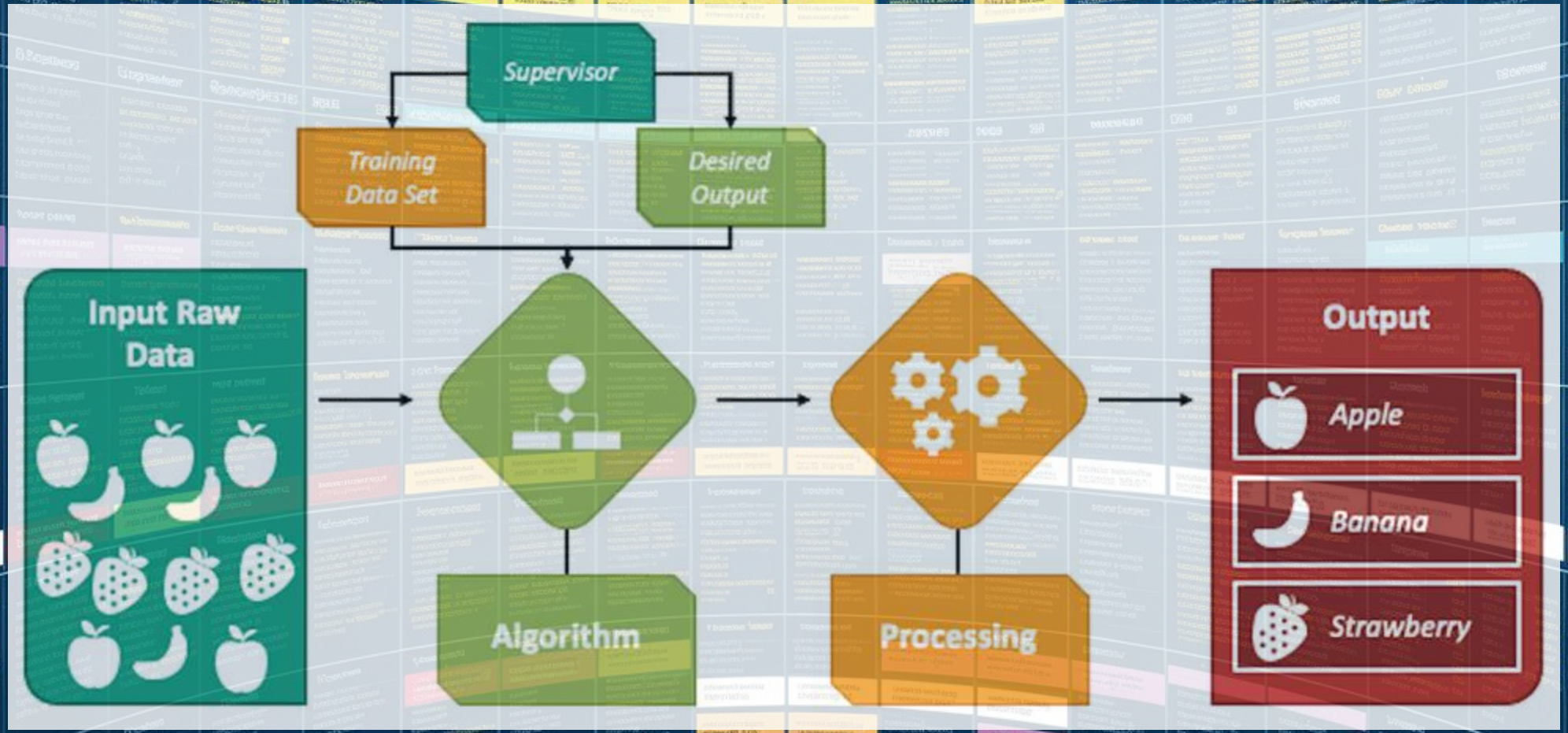
WHAT IS ML?



Machine learning, a subset of AI, allows machines to learn from data without explicit programming.

- supervised learning
- unsupervised learning
- reinforcement learning.

SUPERVISED LEARNING



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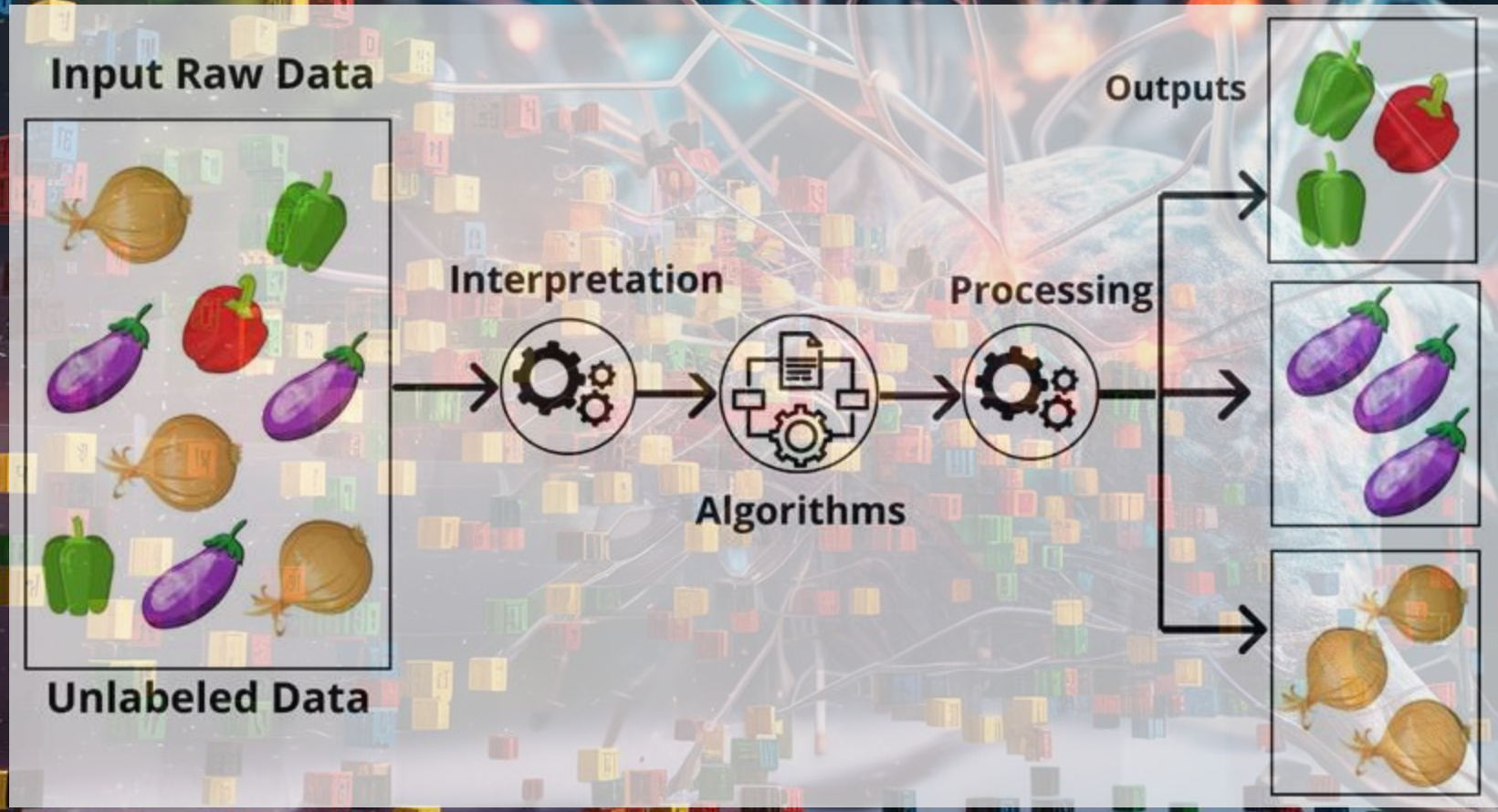
UNSUPERVISED LEARNING



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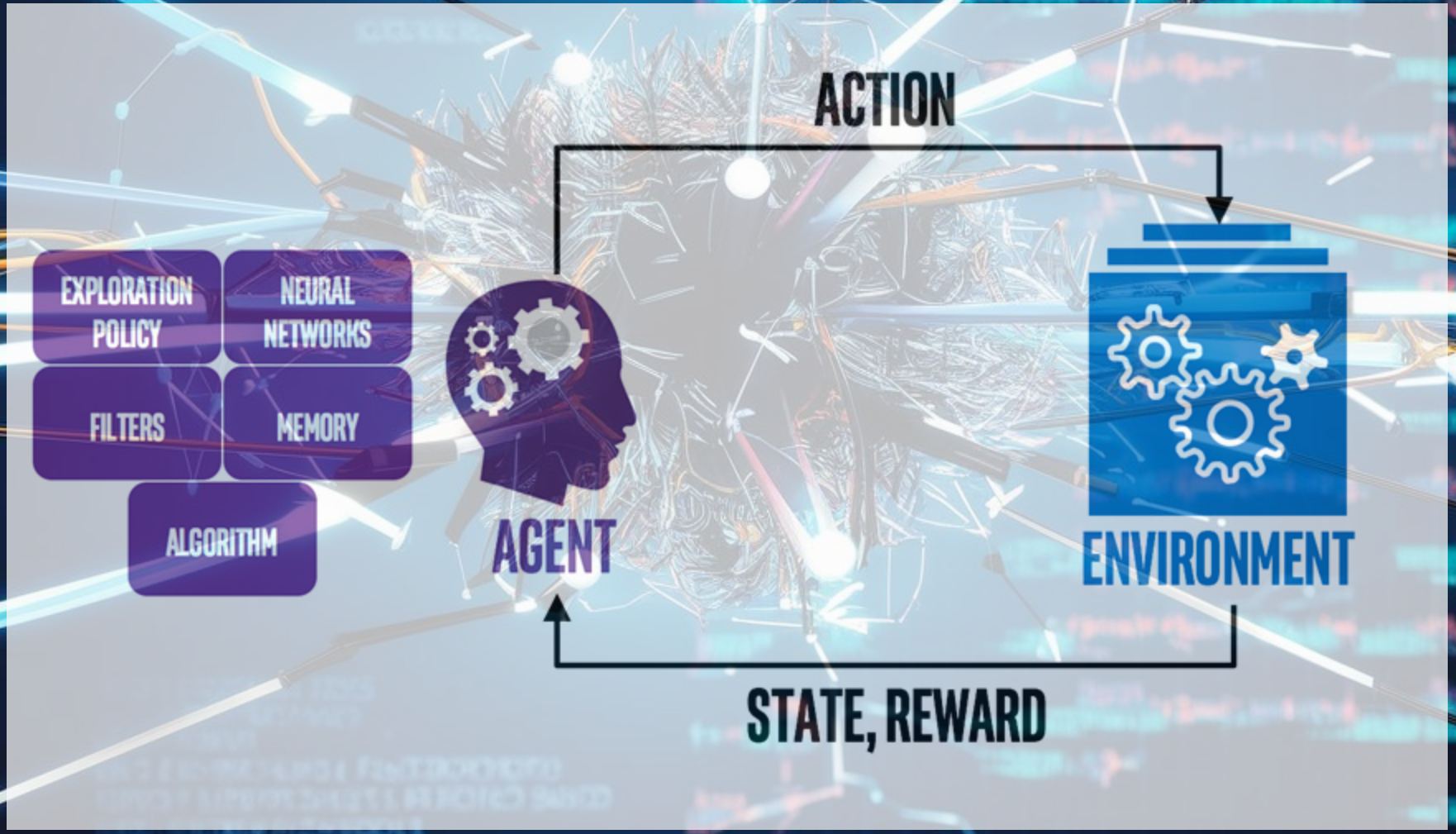
REINFORCEMENT LEARNING



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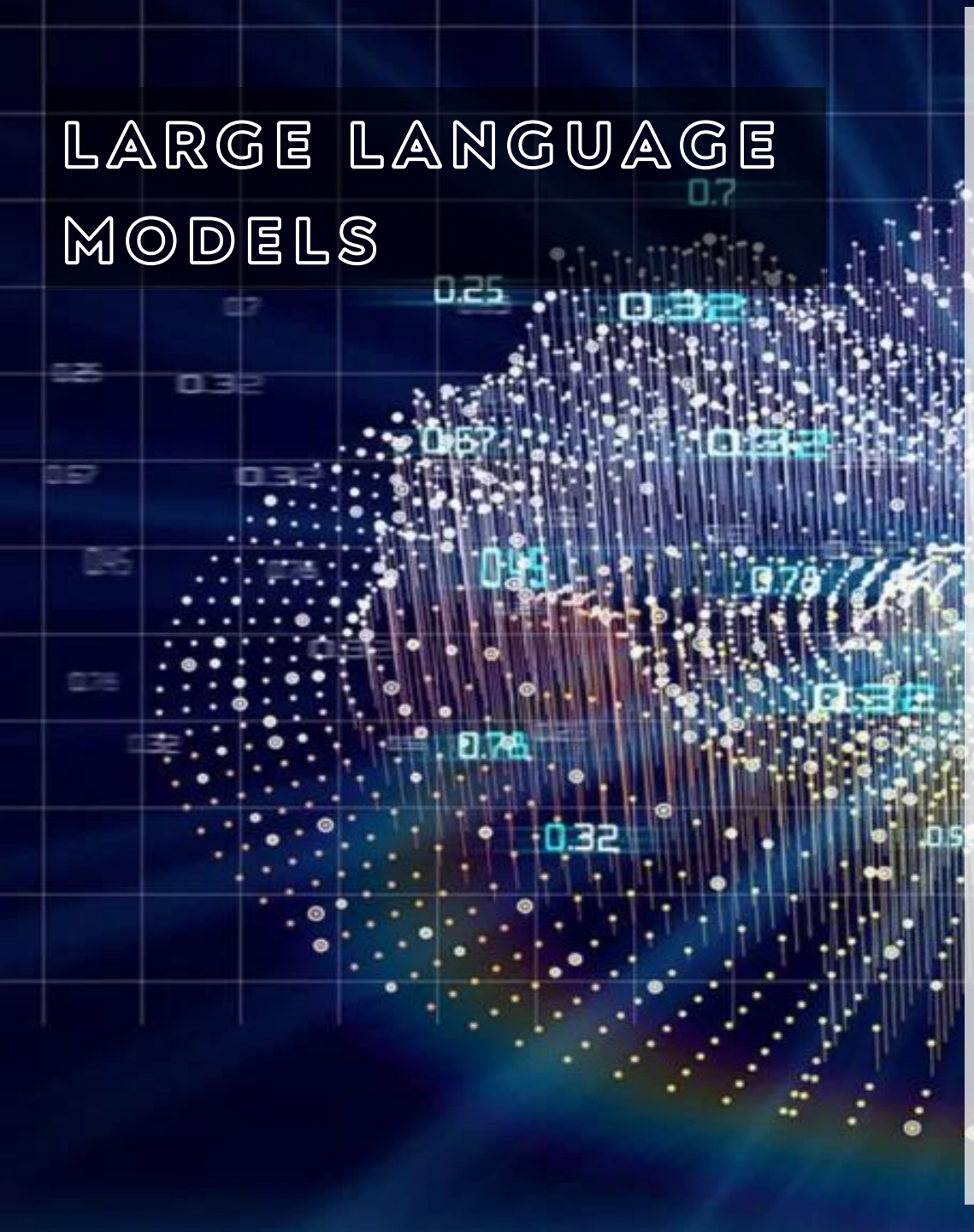
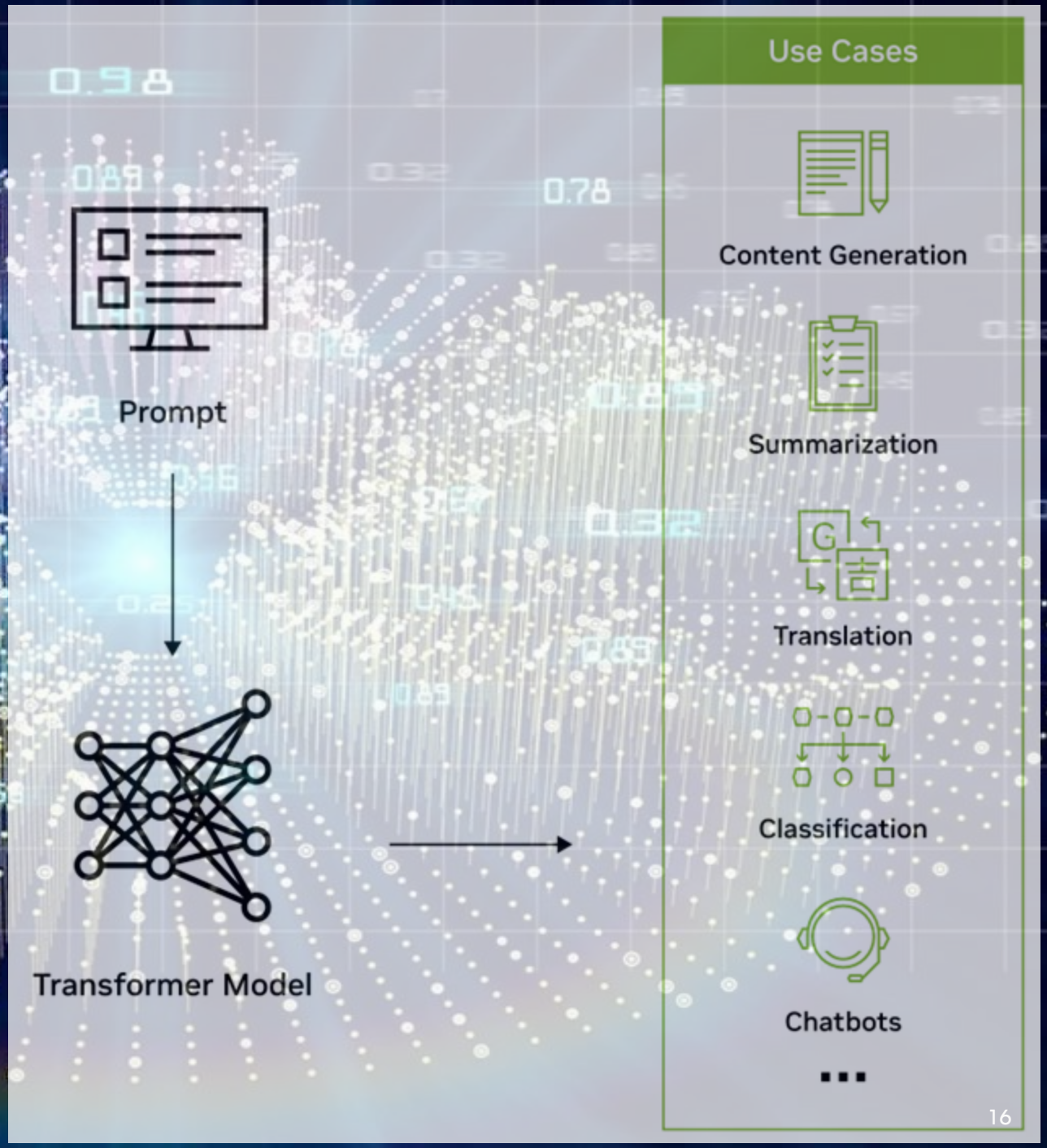
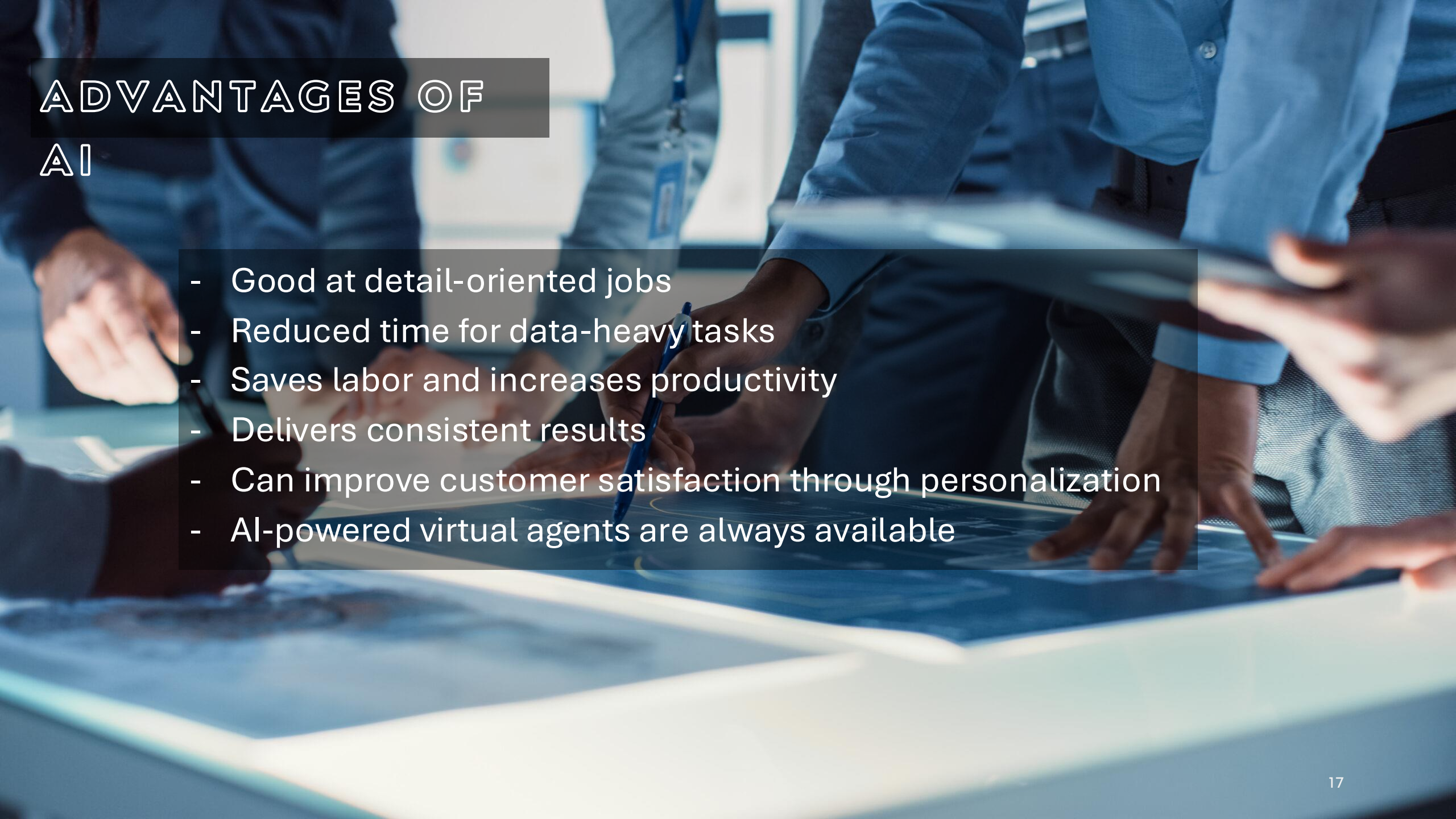
LARGE LANGUAGE MODELS







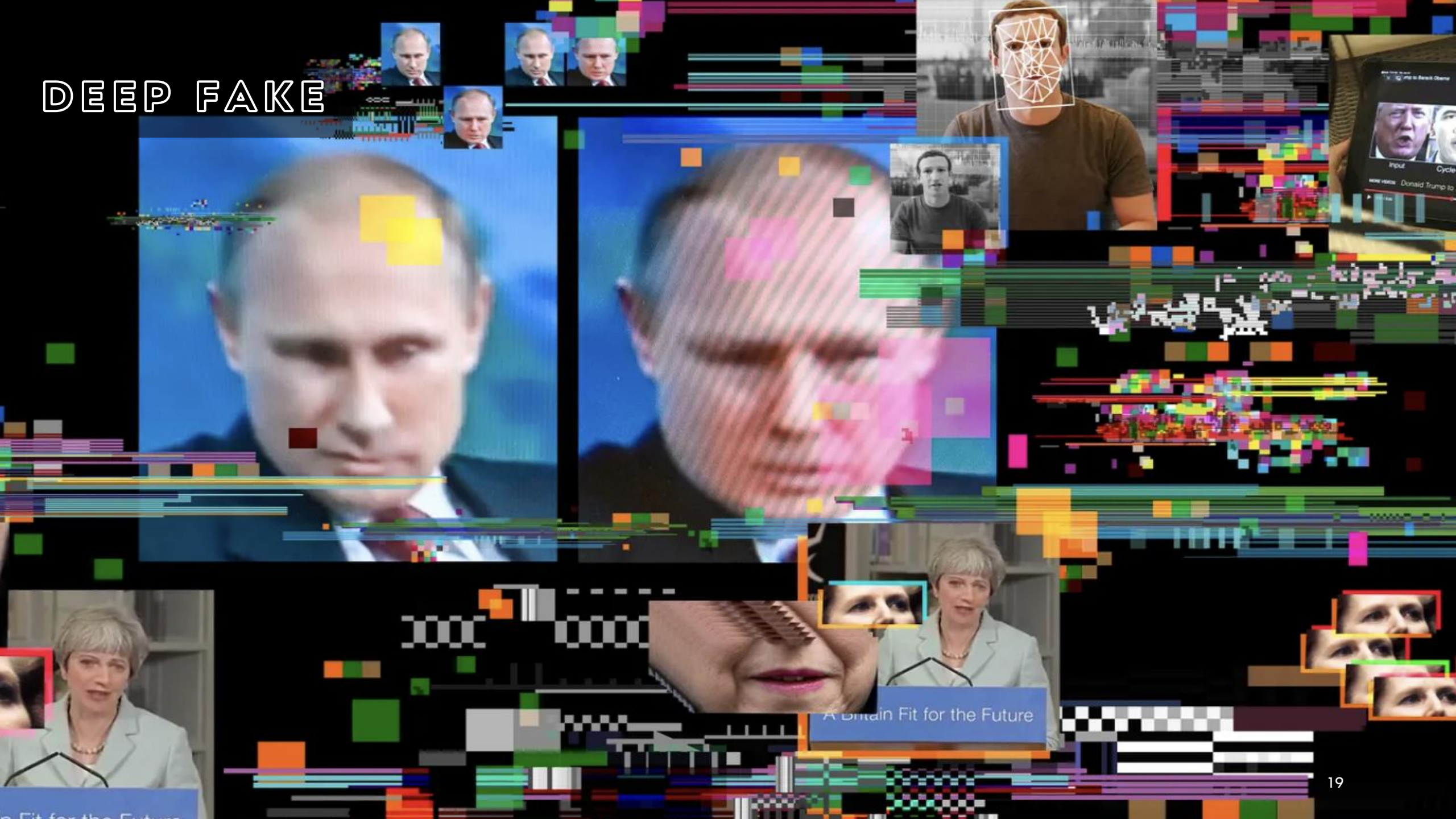
ADVANTAGES OF AI

- Good at detail-oriented jobs
- Reduced time for data-heavy tasks
- Saves labor and increases productivity
- Delivers consistent results
- Can improve customer satisfaction through personalization
- AI-powered virtual agents are always available

DISADVANTAGES OF AI

- Increasing unemployment rates
- Lack of transparency
- Biased and discriminatory algorithms
- Disinformation
- Environmental impact
- Domination by Big Tech companies

DEEP FAKE



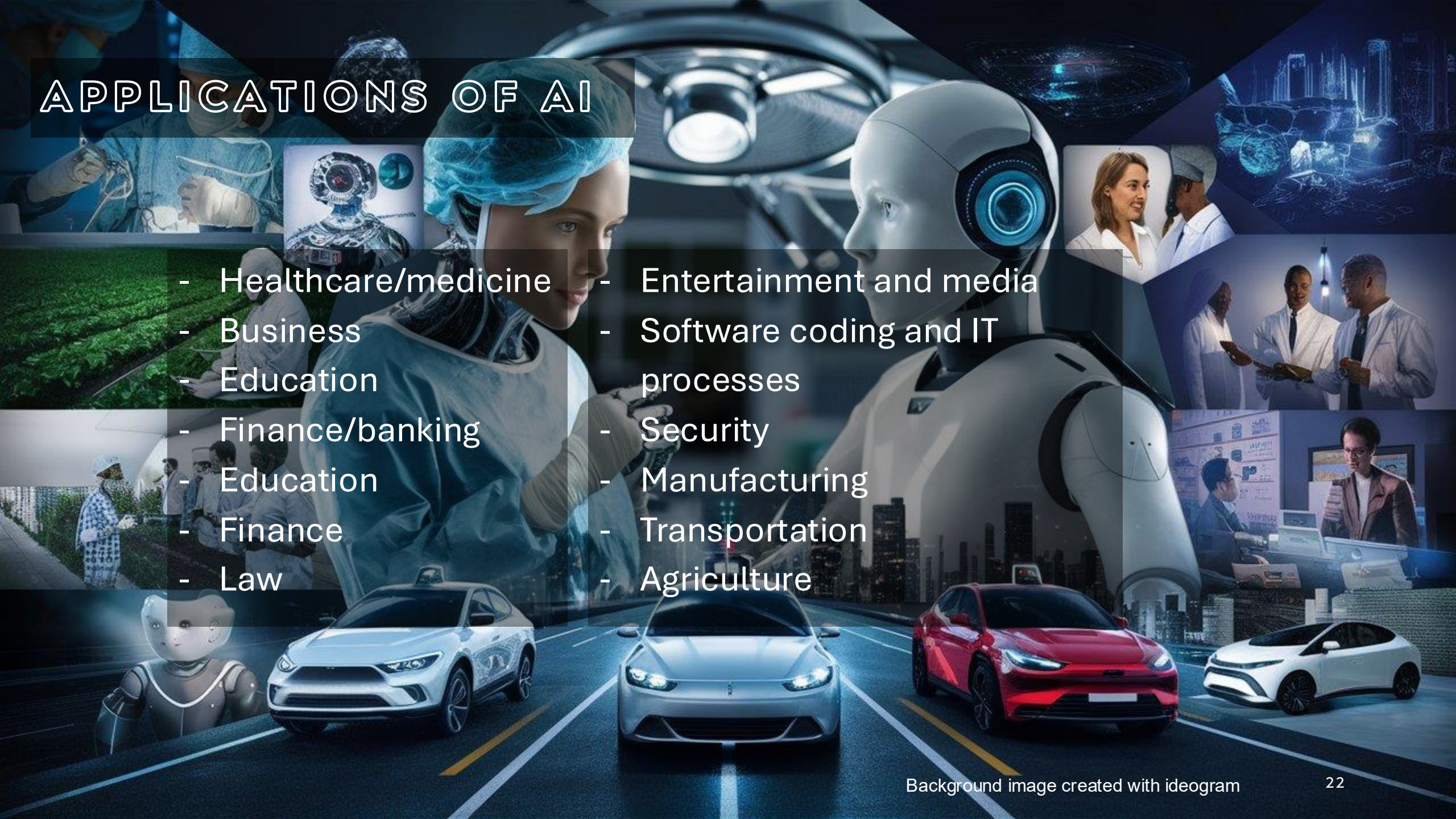
DEEP FAKE

EXAMPLES OF AI TECHNOLOGY

- Automation
- Machine learning
- Machine vision
- Natural Language Processing (NLP)
- Robotics
- Self-driving cars
- Text, image and audio generation

Background image created with ideogram

APPLICATIONS OF AI



- Healthcare/medicine
- Business
- Education
- Finance/banking
- Education
- Finance
- Law
- Entertainment and media
- Software coding and IT processes
- Security
- Manufacturing
- Transportation
- Agriculture

Background image created with ideogram

HOW CAN A STUDENT BE INVOLVED?

- Education and Learning
  - Formal Education (Computer Science, data science, machine learning, and statistics)
  - Online Courses (Coursera, edX, Udacity, DeepLearning.ai, Codecademy, IEEE Learning Network, ...)
  - Books & Research Papers

How can a student be involved?

- Hands-On Experience
  - AI Projects – building machine learning models, developing chatbots, analyzing data, etc.
  - Competitions (Kaggle, hackathons, etc.)
  - Internships – real-world experience.

How can a student be involved?

- Communities and Networking
  - AI Clubs and Societies (IEEE, ...)
  - Online Communities (Reddit's r/MachineLearning, Discord servers, etc.)
  - Conferences and Meetups

How can a student be involved?

- Build a Portfolio
  - GitHub Repository
  - Blogging and Content Creation

HOW CAN A STUDENT BE INVOLVED?

- Stay Informed
  - AI News and Updates
  - Ethical AI Practices
- Mentorship
- Explore Interdisciplinary Opportunities

How can I create an AI model?

- Data Collection and Preparation
  - Python, Pandas, NumPy, Beautiful Soup, Scrapy
- Choose a Machine Learning Algorithm
  - Scikit-learn, TensorFlow, Keras
- Preprocessing and Feature Engineering
  - Scikit-learn, Feature-engine
- Model Training
  - TensorFlow, Keras, Scikit-learn
- Model Evaluation:
  - Scikit-learn, TensorBoard
- Iterate and Improve
  - Experiment Tracking Platforms (Mlflow, TensorBoard.dev)
  - AutoML Tools (Auto-Keras, Auto-sklearn, H2O.ai)
- Deployment
  - TensorFlow Serving, Docker , Flask or Django

THANK YOU!

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