



AI IN THE WASTE INDUSTRY

A NON-TECHNICAL PERSPECTIVE



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WHAT IS AI

- **It's software that can think.** It's a computer program designed to perform tasks that normally require human intelligence.
- **It learns from information.** Instead of being manually programmed for every scenario, it trains on large amounts of data to recognize patterns and make predictions.
- **It solves problems.** Its goal is to find solutions to complex problems, from identifying images to predicting weather patterns.
- **It powers everyday tools.** AI is what helps your phone recommend songs, translates languages in real time, and sorts your email.

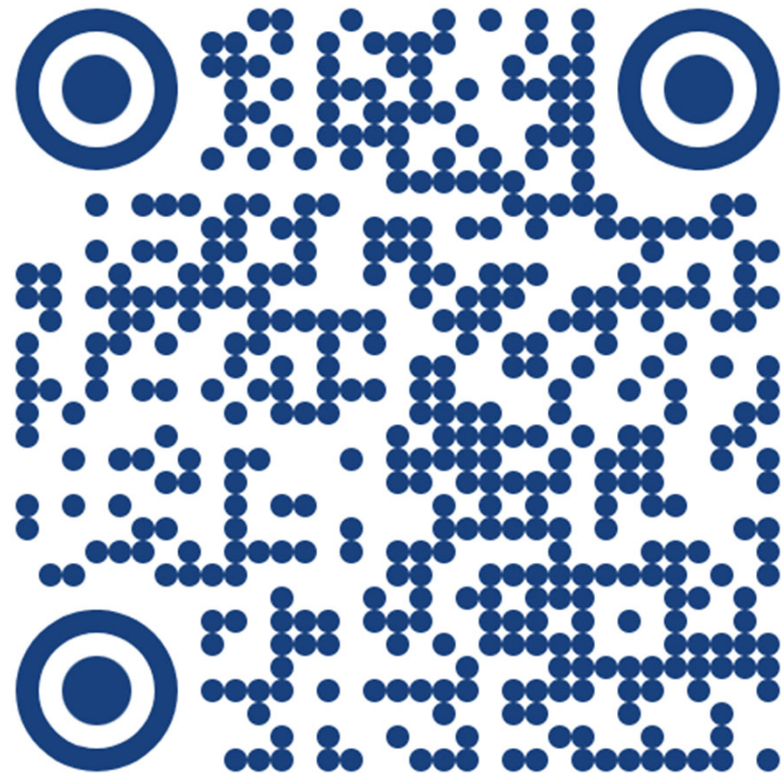
AI is NOT the future...it's already here NOW!



- **Streaming and Shopping:** AI helps services like Netflix and Spotify **recommend movies and music** you'll like. It also suggests products on websites like Amazon.
- **Navigation:** Apps like Google Maps use AI to **find the fastest route** and avoid traffic.
- **Voice Assistants:** Your phone's voice assistant, like Siri or Google Assistant, uses AI to **understand what you say** and follow your commands.
- **Email:** AI works to automatically **filter out spam** and sort your emails into different categories.

How does AI work?

- At its heart, AI works by learning from examples.
- Once it's "trained," it can use what it has learned to make smart predictions and decisions, which is what allows it to do things like find the best route on a map or suggest a movie you might like.



Is AI going to take all of our jobs?

Welcome to **Gemini**, your personal AI assistant



[Google Gemini](#) and the [Gemini Apps Privacy Notice](#) apply. Chats are reviewed and used to improve Google AI. [Learn about your choices](#). Gemini can make mistakes, so double-check it. Info [about your location](#) is also stored with your Gemini Apps activity.

ChatGPT

Ask anything

Attach



Search

Voice

Accuracy. Artificial intelligence and machine learning are rapidly evolving fields of study. We are constantly working to improve our Services to make them more accurate, reliable, safe, and beneficial. Given the probabilistic nature of machine learning, use of our Services may, in some situations, result in Output that does not accurately reflect real people, places, or facts.

Hi there. What should we dive into today?

Message Copilot



Quick response



Create an image

Improve writing

Write a first draft

Design a logo

Write a script

Say it with care

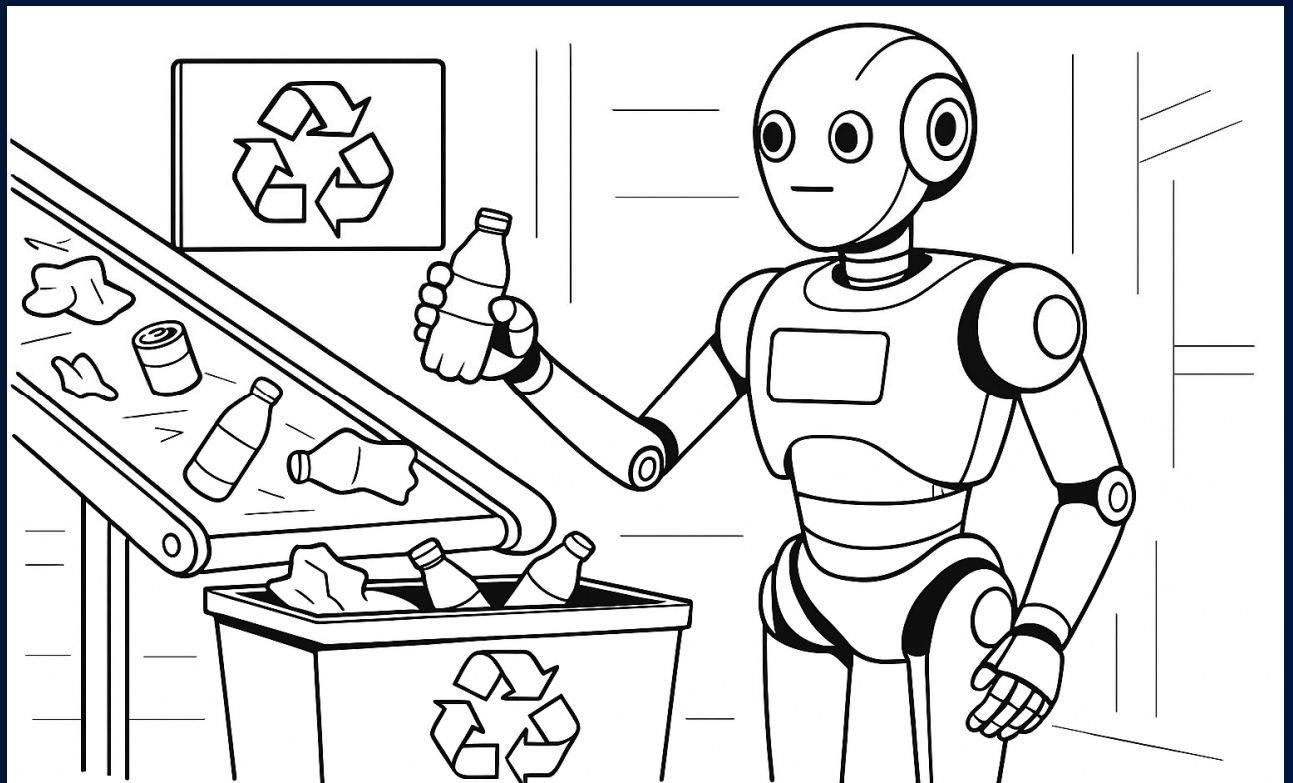
Draft a text

Improve communication

Copilot may make mistakes. Using Copilot means you agree to the [Terms of Use](#). See our [Privacy Statement](#).

Copilot Prompt:

“Create a line drawing showing a robot separating recyclables at a Material Recovery Facility”



AI in the Recycling & Waste Industries



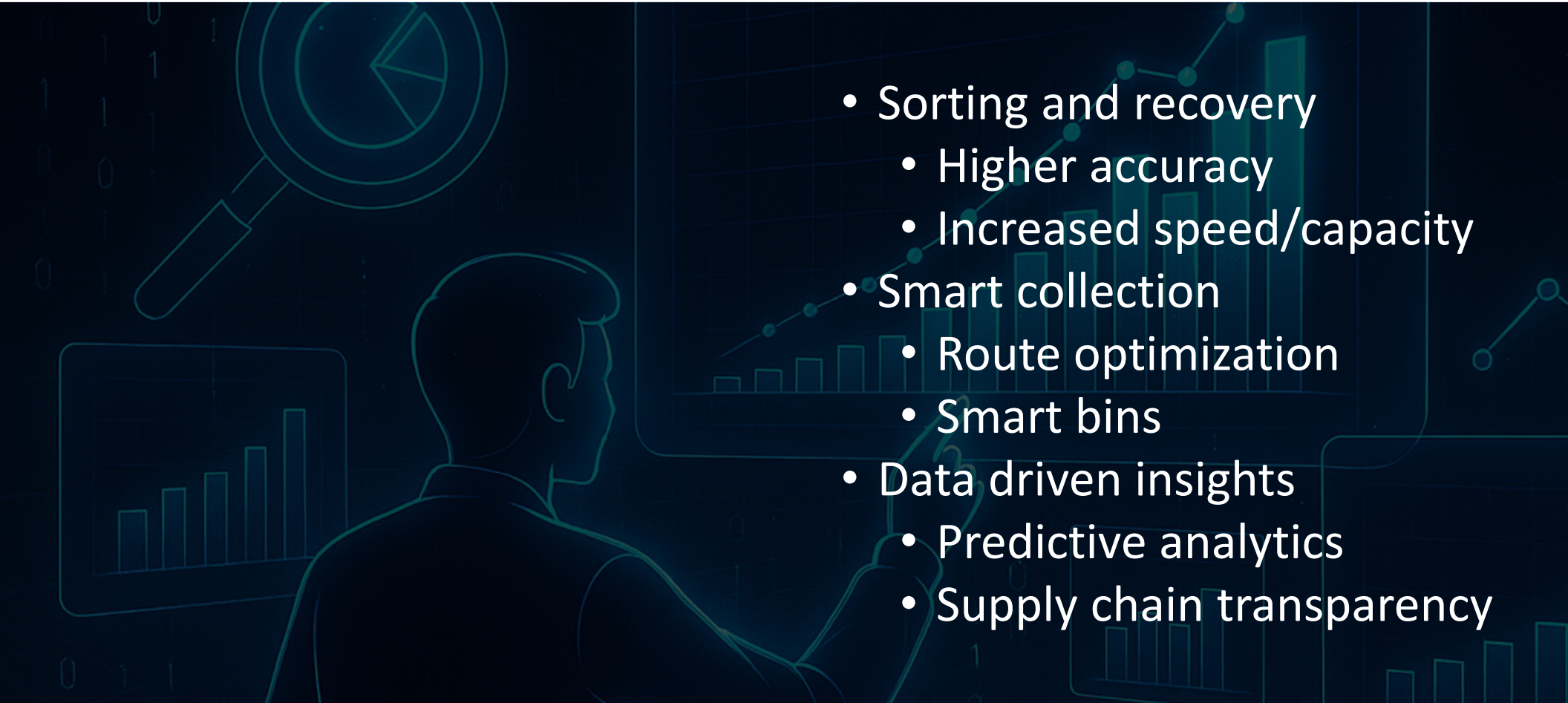
- **Smart Sorting Systems:** AI-powered robots and computer vision systems are used to identify and sort recyclable materials more accurately and efficiently than manual sorting.
- **Route Optimization for Waste Collection:** AI analyzes data from sensors and GPS to optimize garbage truck routes, reducing fuel consumption and improving collection efficiency.
- **Predictive Maintenance:** AI monitors equipment like compactors and conveyor belts to predict failures before they happen, minimizing downtime and repair costs.
- **Waste Stream Analysis:** AI helps track and analyze the types and volumes of waste being processed, enabling better decision-making for recycling strategies and sustainability goals.

In Practice



- **Kansas City, Missouri**, for instance, has implemented an AI system in its waste and recycling trucks to prioritize road repairs and improve public service while collecting waste.
- **London** and **San Francisco** are also using AI to optimize waste collection routes to guide vehicles and reduce fuel consumption and operational costs.
- **Barcelona** has set up smart bins with sensors that alert waste management companies when the bins are full, allowing them to optimize collection routes and keep their streets clean.

Where is AI going in the waste and recycling industries?

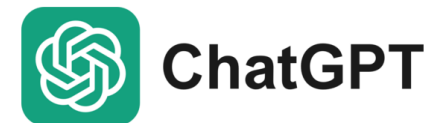
- 
- A person is shown from the back, looking at several data visualizations. The background is dark blue with glowing white lines and icons representing data analysis, including a pie chart, a bar chart, and a line graph. The person is wearing a dark jacket and is positioned in the lower-left quadrant of the image. The overall theme is data-driven decision-making and AI application in waste and recycling industries.
- Sorting and recovery
 - Higher accuracy
 - Increased speed/capacity
 - Smart collection
 - Route optimization
 - Smart bins
 - Data driven insights
 - Predictive analytics
 - Supply chain transparency

What AI tools are available?

Waste & Recycling Industry Specific



Generative AI



OSCAR[®] SORT



Oscar Sort is an AI-powered recycling assistant that uses a camera to identify waste items and then guides users to the correct disposal bin.

Benefits of Oscar Sort:

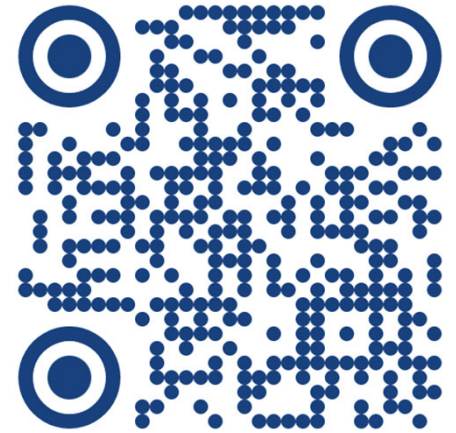
- Identifies and Guides
- Gamifies Recycling
- Reduces Contamination
- Provides Data and Insights
- Easy to Implement

Ethical Implications

- Job Displacement & Workforce Transformation
- Algorithmic Bias
- Data Privacy / Security
- Environmental Impact



Play Time!!!



Prompt:

“Create a Facebook post explaining the benefits of recycling”

🌍🌟 Recycle for a Brighter Future! 🌟🌍

Did you know that recycling is one of the simplest yet most powerful actions we can all take to protect our planet? Every time you sort your plastics, paper, glass, and metal, you're making a huge difference!

Here are just a few incredible benefits of recycling:

Saves Natural Resources: Recycling reduces the need to extract raw materials from the Earth. Think about it – making a new aluminum can from a recycled one uses 95% less energy than making it from scratch!

Reduces Landfill Waste: Our landfills are filling up fast! Recycling diverts waste, extending the life of existing landfills and reducing the need to create new ones. This also means less harmful methane gas released into our atmosphere.

Conserves Energy: Manufacturing products from recycled materials often requires significantly less energy than producing them from virgin materials. This means lower energy consumption and fewer greenhouse gas emissions.

Less Pollution: Recycling helps reduce air and water pollution associated with extracting raw materials and manufacturing new products.

Creates Jobs: The recycling industry supports numerous jobs, from collection and processing to manufacturing and research. It's good for the economy!

Let's make recycling a habit for ourselves and future generations. Every bottle, can, and paper you recycle counts!

What's your favorite thing to recycle? Share in the comments below! 🗳️

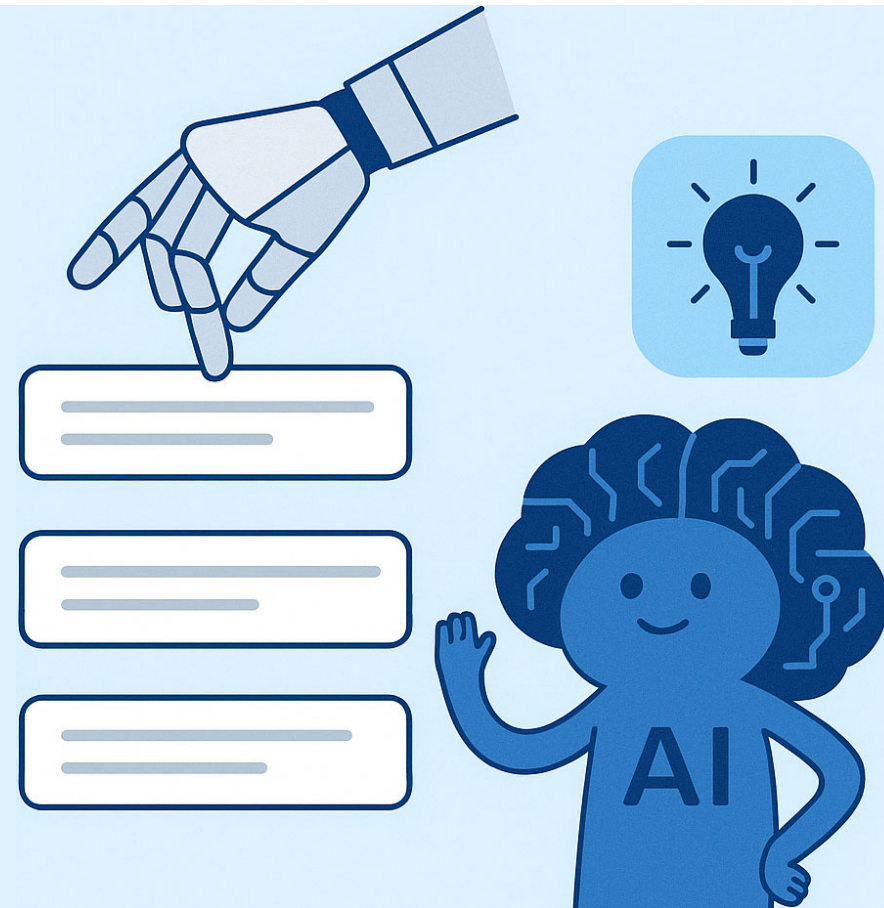
#Recycle #GoGreen #Sustainability #ProtectOurPlanet #EarthFriendly #WasteReduction #CircularEconomy #MakeADifference



**RECYCLE TODAY FOR
BETTER
TOMORROW**

Prompt Engineering

- Role or Persona
- Goal or Task
- Context or References
- Format
- Examples or Constraints



New Prompt:

“From the perspective of the Director of the Iowa Waste Reduction Center at the University of Northern Iowa, create a facebook post targeting the general public that promotes recycling. The post will be published on America Recycles Day. Keep it under 150 words.”

Happy America Recycles Day! ♻️

From the Iowa Waste Reduction Center at UNI, we want to thank all Iowans who make the effort to recycle. Every aluminum can, every glass bottle, and every piece of cardboard you properly sort is a vital step in our state's journey toward a more sustainable future.

Recycling isn't just a good idea; it's a critical part of our economy and environment. By recycling, we conserve valuable resources, save energy, and reduce the burden on our landfills. This helps us protect Iowa's natural beauty and build a more resilient state.

Let's continue to be leaders in waste reduction and show the nation what a difference we can make together!

#AmericaRecyclesDay #UNI #IWRC #IowaRecycles
#Sustainability



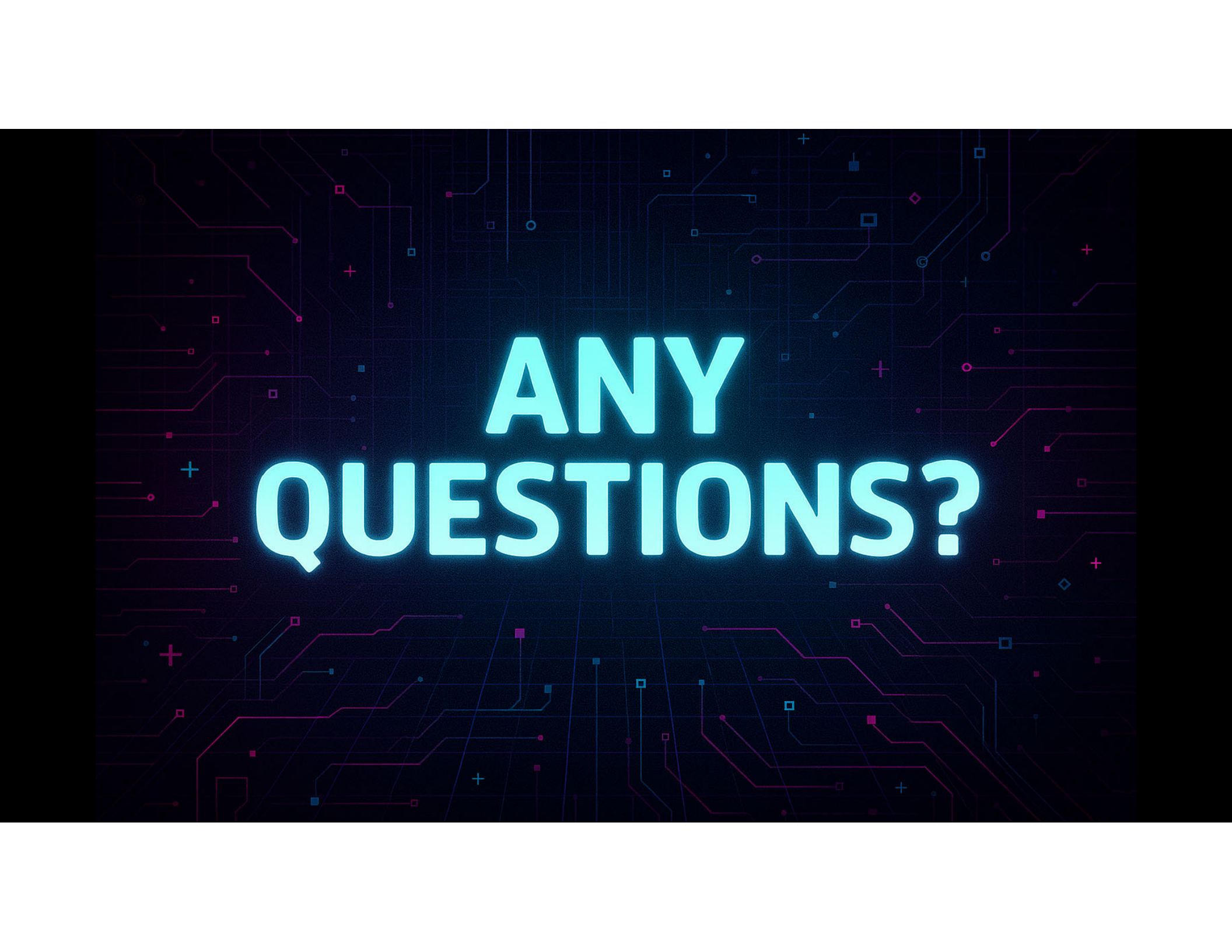
**RECYCLE TODAY FOR
BETTER TOMORROW
AMERICA
RECYCLES DAY**

**RECYCLE
TODAY & BETTER
TOMORROW**

 **IWRC**
Iowa Waste Reduction Center

**“You never change
things by fighting
the existing reality.
To change
something, build a
new model that
makes the existing
model obsolete.”**

**— Buckminster Fuller
Architect, Systems Theorist
and Futurist**



**ANY
QUESTIONS?**

AI in the Waste Industry - A Non-Technical Perspective

Presented by Joe Bolick - Director, Iowa Waste Reduction Center
2025 Iowa Recycling and Solid Waste Management Conference

Prompts Used for Presentation Slides

Title Slide:

CoPilot Prompt: create a title slide for a presentation titled, "AI in the Waste Industry: A Non-Technical Perspective" make it futuristic looking with several images on it as well

Slide Two:

Gemini Prompt: Give me four oversimplified bullets that answer the question, "what is AI?"

CoPilot Prompt: Create a futuristic graphic with transparent background that says, "What is AI?"can I have it as a transparent png?.....I wanted the What is AI graphic, not the robot one

Slide 3:

Gemini Prompt: Where is AI used in everyday life? Can you simplify this?

Copilot Prompt: Create an image of AI being used in everyday life. Break it down into separate scenes

Slide 4:

Gemini Prompt: Write a paragraph about how AI works as if explaining it to a non-technical person. Please shorten it to one simple paragraph.

Slide 6:

Copilot Prompt: Create a line drawing of a robot sorting recyclables at a Material Recovery Facility.

Slide 7:

Copilot Prompt: Give me three to four bullet points on how AI is currently being used in the waste and recycling industries. Create realistic image of waste hauler using route optimization gps. Create a realistic image of a smart sorting system at a material recovery facility.

Slide 8:

Gemini Prompt: What major cities are using AI for waste hauling route optimization?

Slide 9:

Gemini Prompt: What does the future of AI look like in the waste and recycling industries?

Copilot Prompt: create an animated image with no words that signifies data driven insights. make it more futuristic

Slide 10:

Gemini Prompt: What AI tools are available to professionals in the waste and recycling industries right now

Slide 12:

Gemini Prompt: What are the ethical implications of artificial intelligence being implemented more and more into the waste and recycling industries

Copilot Prompt: create an image that represents "ethical implications of AI" but use no text

Slide 14:

Gemini Prompt: Create a Facebook post explaining the benefits of recycling.

Copilot Prompt: Create a recycling image for facebook

Slide 15:

Copilot Prompt: Create an image about AI prompt engineering without any words

Slide 16:

Gemini Prompt: From the perspective of the Director of the Iowa Waste Reduction Center at the University of Northern Iowa, create a facebook post targeting the general public that promotes recycling. The post will be published on America Recycles Day. Keep it under 150 words.

Copilot Prompt: Create an image for facebook celebrating America Recycles Day. The image should represent recycling in Iowa. Can you add more to it and make it more colorful while including the logo of the Iowa Waste Reduction Center. Can you combine elements of both of them into one image?

Slide 18:

Find a quote about the importance of adapting to technology and provide the proper attribution.

Slide 19:

Create a widescreen powerpoint slide that asks the audience if they have any questions? make it playful and futuristic. Let's make it look cyberpunk for AI education.