

# **Harnessing Artificial Intelligence: Exploring What's Practical and Possible**

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**Prompt:** 40-something technology guy, family man, loves designing and developing software, works from home, starting a new venture called Foundri, building Web apps for smart customers looking to build lasting value

# What is AI?

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**Machine Learning**

**Natural Language  
Processing (NLP)**

**Computer Vision**

# Machine Learning

Supervised learning, Unsupervised learning, Reinforcement learning

**Machine learning** is a branch of artificial intelligence (AI) and computer science which focuses on the use of **data and algorithms** to imitate the way that humans learn, gradually improving its accuracy.

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# Natural Language Processing (NLP)

Named Entity Recognition, Sentiment Analysis, Text Summarization,

A branch of AI that combines **deep learning, machine learning, and linguistics** to enable computers to understand and generate human language so that they can effectively communicate with people. It involves the development of computational models and algorithms that can analyze the **structure, syntax, and semantics** of the natural language, as well as the context in which it is used.

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# Computer Vision

Deep learning and a  
convolutional neural network  
(CNN)

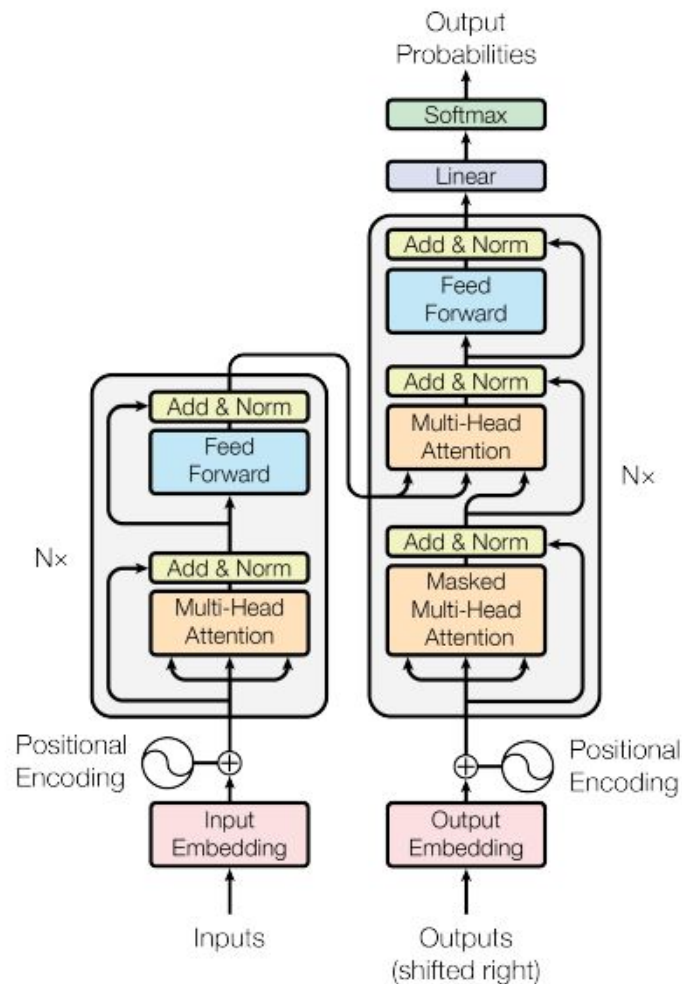
**Computer vision** is a field of artificial intelligence (AI) that enables computers and systems to **derive meaningful information** from digital images, videos and other visual inputs — and take actions or make recommendations based on that information. If AI enables computers to think, computer vision enables them to **see, observe and understand.**

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**Machine learning** is a part of artificial intelligence that helps computers learn from data so they can get better at tasks over time. **Natural Language Processing** allows computers to understand and use human language, making it easier for them to talk to us. **Computer vision** lets computers understand what they see in pictures and videos, similar to how humans use their eyes.

## Deep Dive: Attention is All You Need



# **Practical Uses for AI in Agriculture Business**

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## Chat bots

**Tool:** OpenAI - Custom  
“AgriAdvisor” GPT



**You**

I grow mostly organic beets...anything unique about that crop?



**AgriAdvisor**

Organic beets, now that's a crop that takes a special touch. Here's some tips for growing organic beets:

1. **Soil Prep:** Beets favor loamy, well-drained soil with a pH of 6.0 to 7.0. Add compost to provide the rich, fertile ground they love.
2. **Sowing:** Plant beet seeds about half an inch deep and space them about 12 inches apart. They're a bit finicky about their personal space, so thin them out to 6 inches once they've sprouted a few true leaves.
3. **Watering:** Keep the soil consistently moist but not waterlogged. Beets are drought tolerant, but they'll need a steady supply of water to develop those beautiful roots.
4. **Weeding:** Keep the rows weed-free. Weeds will compete with your beets for nutrients and water.



## Package/Logo Design

**Tool:** Midjourney

**Prompt:** high end logo of a cow, artwork for side of milk carton, white background, sunny, high key, fun and energetic

## Graphic/Logo Design



**Tool:** Adobe Firefly

**Prompt:** Text effects > “leafy pothos”

# Product photography

Baseline, background  
images

**Tool:** DALL-E 3 (OpenAI ChatGPT)

**Prompt:** plain white milk carton on a  
fence rail at a dairy farm, photorealistic  
product photograph



## Image Analysis

Interpreting pictures of crop damage and giving advice

**Tool:** OpenAI ChatGPT



Take a look at this image. What is eating my cabbage?



**AgriAdvisor**

Well now, that there is a classic case of cabbage leaves looking like this. One of the most common types of damage is usually the work of critters like cabbage loopers or imported cabbageworms. They're the larval forms of moths and they eat the leaves. Once those eggs hatch, the caterpillars start munching on the leaves, leaving behind small holes.



## Drone-based Mapping, Spraying/Spreading

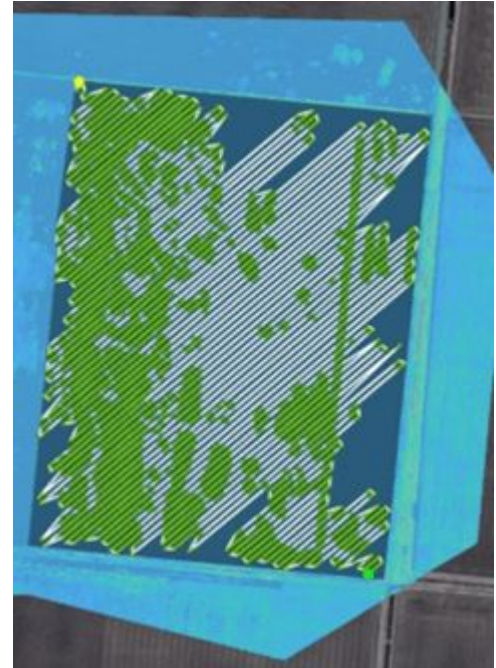
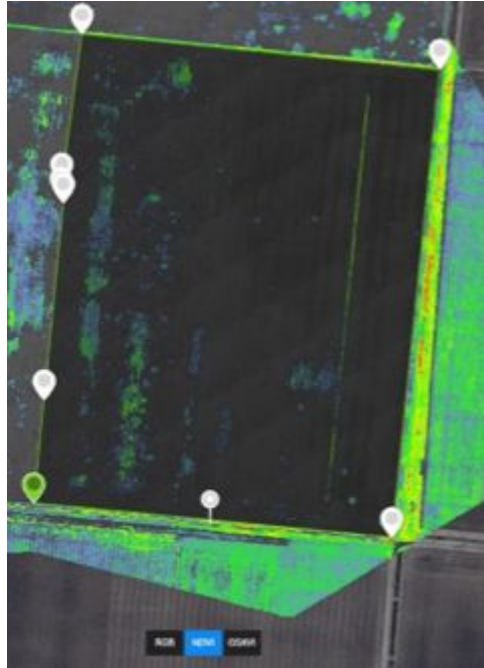
No piloting expertise  
needed, AI-controlled flight  
system

**Tool:** DJI Agras T40



## Precision Spraying

Multi-spectral monitoring monitor fields before and after sowing, Normalized Difference Vegetation Index (NDVI) used to separate the occurrence location of weeds, and the prescription map of accurate spraying generated and sprayed to agricultural drone to achieve accurate weeding.



# Crop Health Analysis

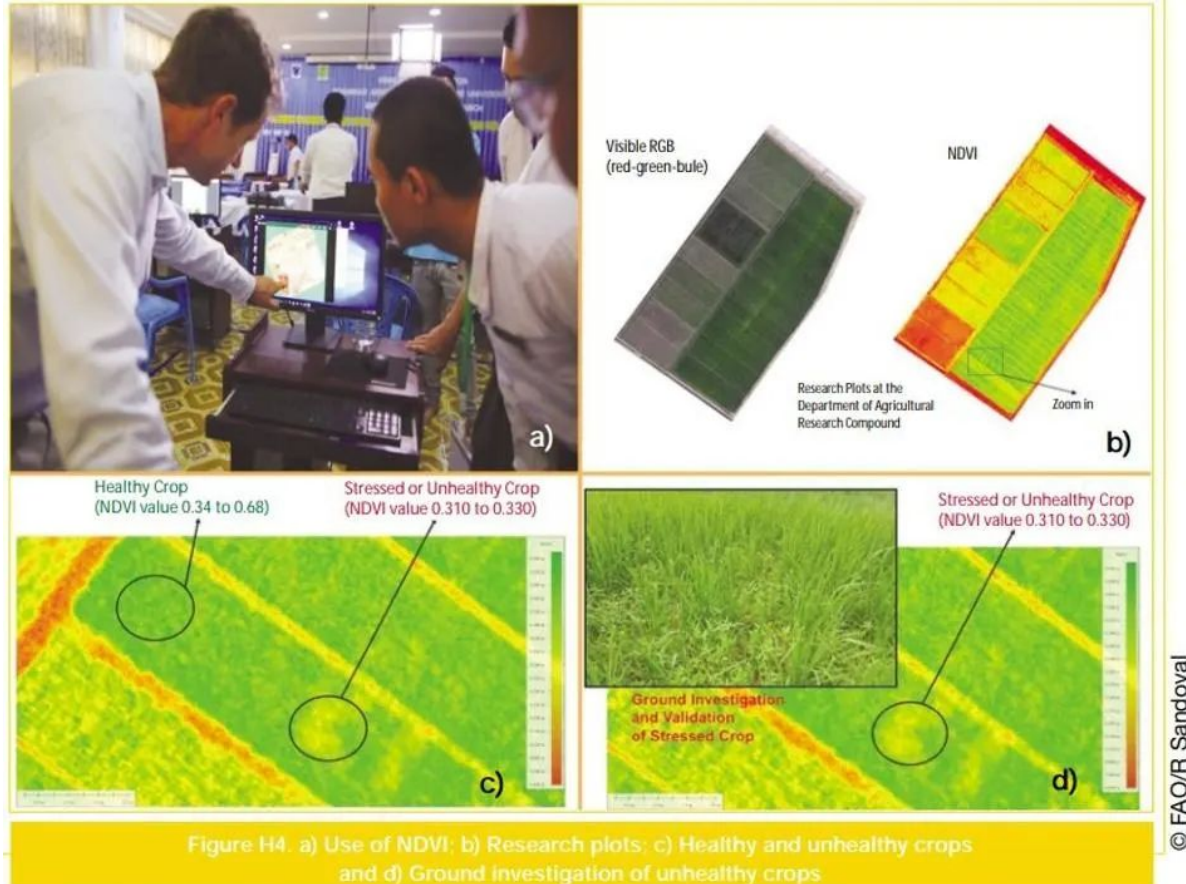
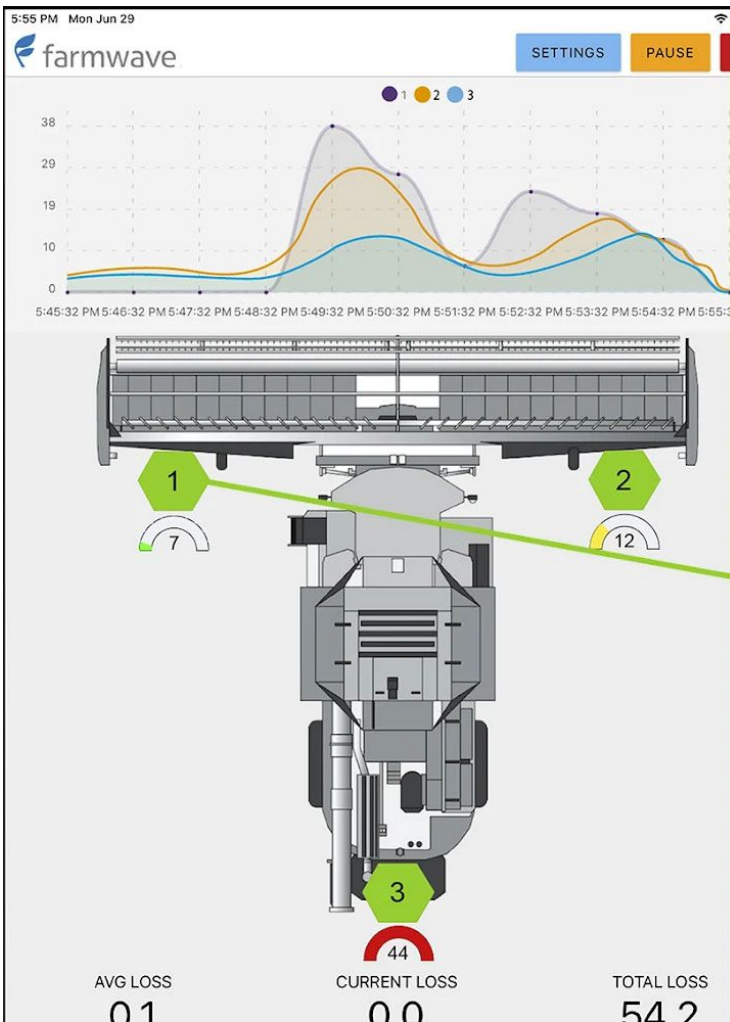


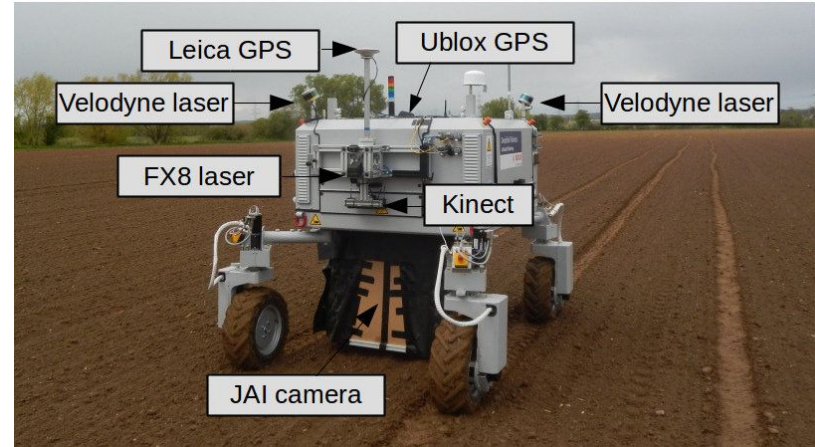
Figure H4. a) Use of NDVI; b) Research plots; c) Healthy and unhealthy crops and d) Ground investigation of unhealthy crops



## Loss Prevention

**Tool:** Farmwave.io

## Weeding Robots



# Weeding Robots

**Tool:** Carbon Robotics



# Cattle Detection

The interface displays an aerial view of a green field with a cluster of cattle in the center. Each cattle is labeled with a blue 'Cattle' tag and a white ID number. Some cattle are also labeled with 'Eating' (pink tag) or 'Hereford' (green tag). A blue banner at the top of the field reads 'Assigned to Miles'.

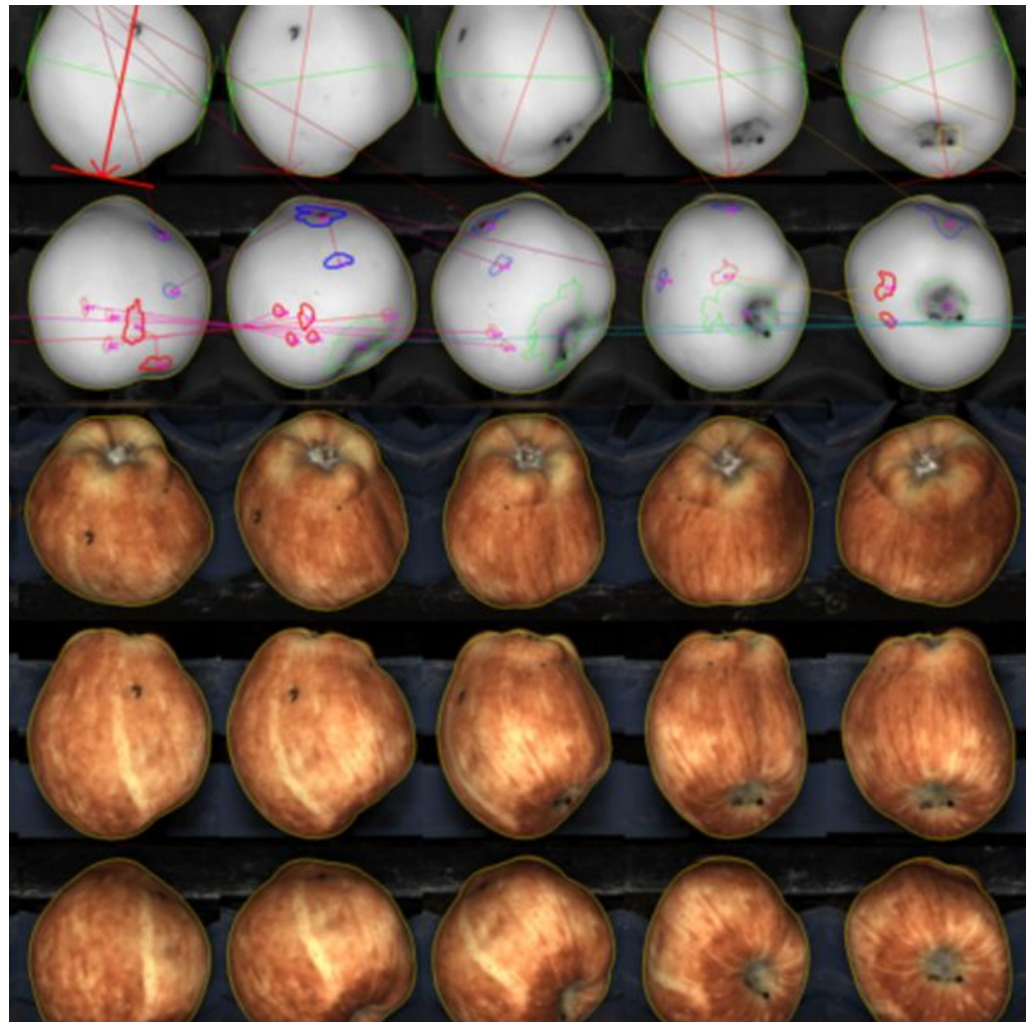
**Left Sidebar:** A vertical toolbar with icons for navigation and editing, including a compass, a star, a pencil, a eraser, a rectangle, a circle, a line, a cube, a location pin, a speech bubble, a person, and a chat bubble. Below the toolbar, it shows '31%' zoom and a summary bar with 'ALL' and '5' items.

**Right Sidebar:** A panel titled 'ANNOTATIONS' with a list of detected cattle. Each entry includes a 'Cattle' icon, a '#' icon for attributes, a 'Click to add Attributes' link, a 'Click to add text' link, and a 'Click to add text' link. The list includes cattle with IDs 98, 92, 73, and 50. Below the list is a 'TAGS' section with a search bar and a list of tags: '20/08', 'Field of Cows', 'Healthy', '03/06', 'Lettuce Farm', 'July 2020', 'South Orchard', and 'Orchard 3'. At the bottom of the sidebar are 'Create' and 'Tag' buttons.

**Bottom Bar:** A row of five small thumbnail images showing different scenes: a person in a field, a field of crops, a field of crops, a field of crops, and a field of crops with a 'KS' logo.

# Produce Grading

**Tool:** Ellips

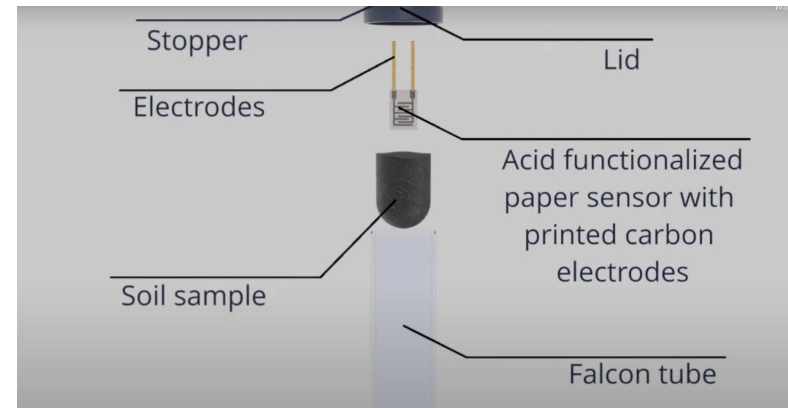


# Ag Robots

**Tool:** Agrobot



# Optimisation of Fertiliser Use



# Review Complex Organic Regulatory Rules

**Tool:** OpenAI ChatGPT  
**Prompt:** What are the new requirements for USDA certifying agents?



## National Organic Program (NOP); Strengthening Organic Enforcement

A Rule by the Agricultural Marketing Service on 01/19/2023

The image shows a screenshot of the "PUBLISHED DOCUMENT" page for the rule "National Organic Program (NOP); Strengthening Organic Enforcement". The page has a sidebar on the left with icons for "AGENCY:", "ACTION:", and "SUMMARY:". The main content area is titled "DOCUMENT DETAILS" and contains the following information:

**AGENCY:** Agricultural Marketing Service

**ACTION:** Final rule.

**SUMMARY:** This rulemaking a organic regulator handling, and sale integrity in the or the USDA organic farm to market tri organic regulator

The new requirements for USDA certifying agents regarding NOP Import Certificates are complex and multifaceted. Here's a summary of the key points:

- 1. Generation and Database Use:** NOP Import Certificates must be generated using the USDA Organic Integrity Database. Only USDA-accredited certifying agents and those accredited in foreign countries with which the USDA holds an organic trade agreement are authorized to use the database.
- 2. Data Source and Verification:** The data for NOP Import Certificates are generated by the certifying agent of the exporter, who must ensure the organic product complies with USDA organic standards and has not been exposed to prohibited substances.
- 3. Certificate Issuance:** Certifying agents have the authority to issue NOP Import Certificates for specific shipments or timeframes, such as weekly, monthly, or seasonally, and must conduct audits to verify the authenticity of the organic products covered by the certificate.
- 4. Auditability and Verification:** The certifying agent must have a documented organic certification system for intaking and approving or rejecting NOP Import Certificate requests, ensuring

# Case Study: A recipe app

# Composable AIs

- **ChatGPT:** Use ChatGPT for a List of common ingredients found in everyone's kitchen.
  - Generate a list of dishes that can be made with these ingredients.
  - Write an entire recipe of one of the dishes.
- **Midjourney:** generate an image from the recipe
- **ChatGPT and Github Copilot:** Write the code for a landing page



## Code Completion

```
return (  
  <main>  
    <div className="■ ○ ○ ○">  
      <div className="○ ○ ○">  
        <h1 className="○ ○ ○">  
          Tomato and Garlic Bruschetta  
        </h1>  
        { /* hero image of recipe */ }  
        <div className="○ ○ ○">  
          <Image  
            src="/images/bruschetta.jpg"  
            layout="fill"  
            objectFit="cover"  
            className="rounded-lg"  
          </div>  
          <div className="○ ○ ○">  
            <p>  
              <strong>Servings:</strong> 4  
            </p>  
            <p>  
              <strong>Preparation Time:</strong> 15 minutes  
            </p>  
            <p>  
              <strong>Cooking Time:</strong> 5 minutes
```

# Final Site from Generated Copywriting, Code and Image

**Tools:** ChatGPT, Midjourney, Github  
Copilot

## Tomato and Garlic Bruschetta



**Servings:** 4

**Preparation Time:** 15 minutes

**Cooking Time:** 5 minutes

**Total Time:** 20 minutes

### Ingredients

- 4 slices of bread (preferably a rustic or sourdough variety)
- 2 large tomatoes, diced
- 3 cloves garlic, minced
- 1/4 cup olive oil, plus extra for brushing
- Salt to taste
- Optional: Fresh basil leaves for garnish

### Equipment

- Mixing bowl
- Baking sheet
- Oven
- Knife and cutting board
- Pastry brush

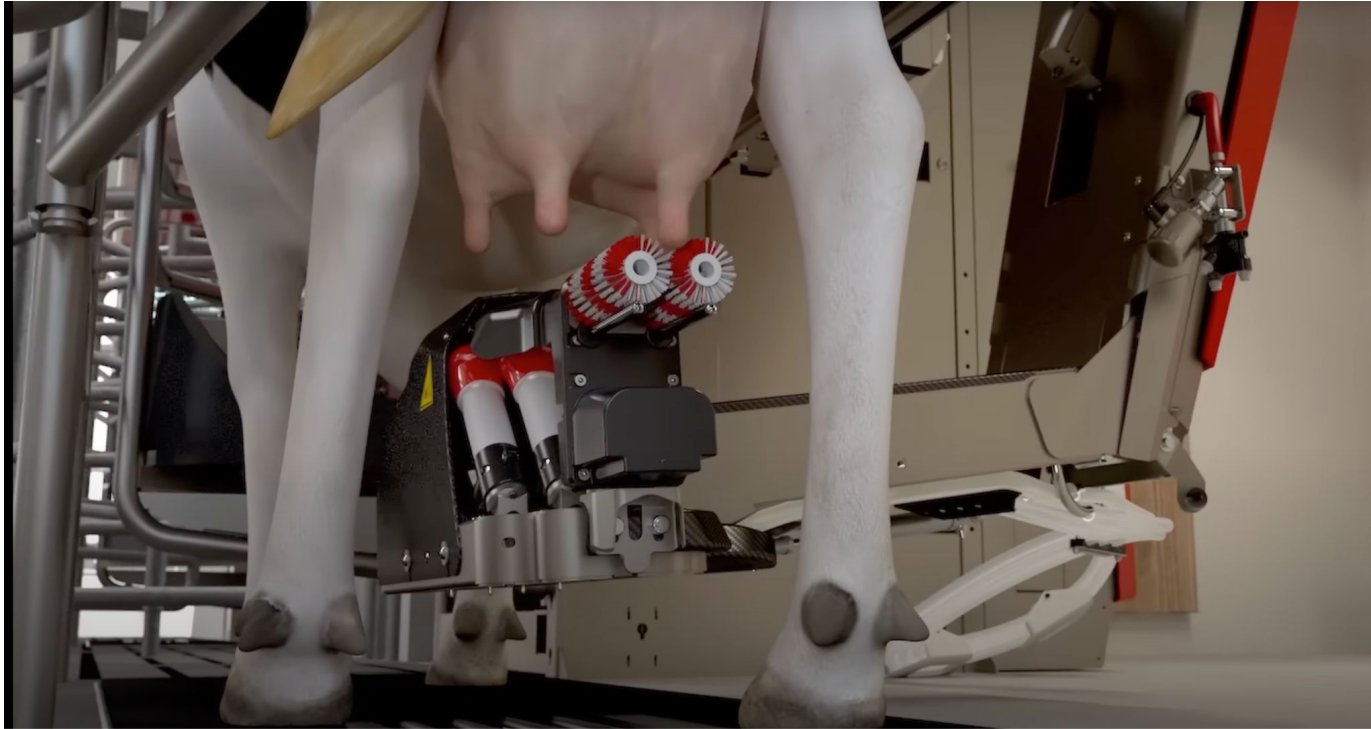
<https://recipe-app-delta-ruby.vercel.app/>

# The future of AI in Ag Business

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# Fully Autonomous Robotic Hydroponic Farms





## Auto-Milking

**Tools:** Lely Astronaut

## AI Design Partner



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