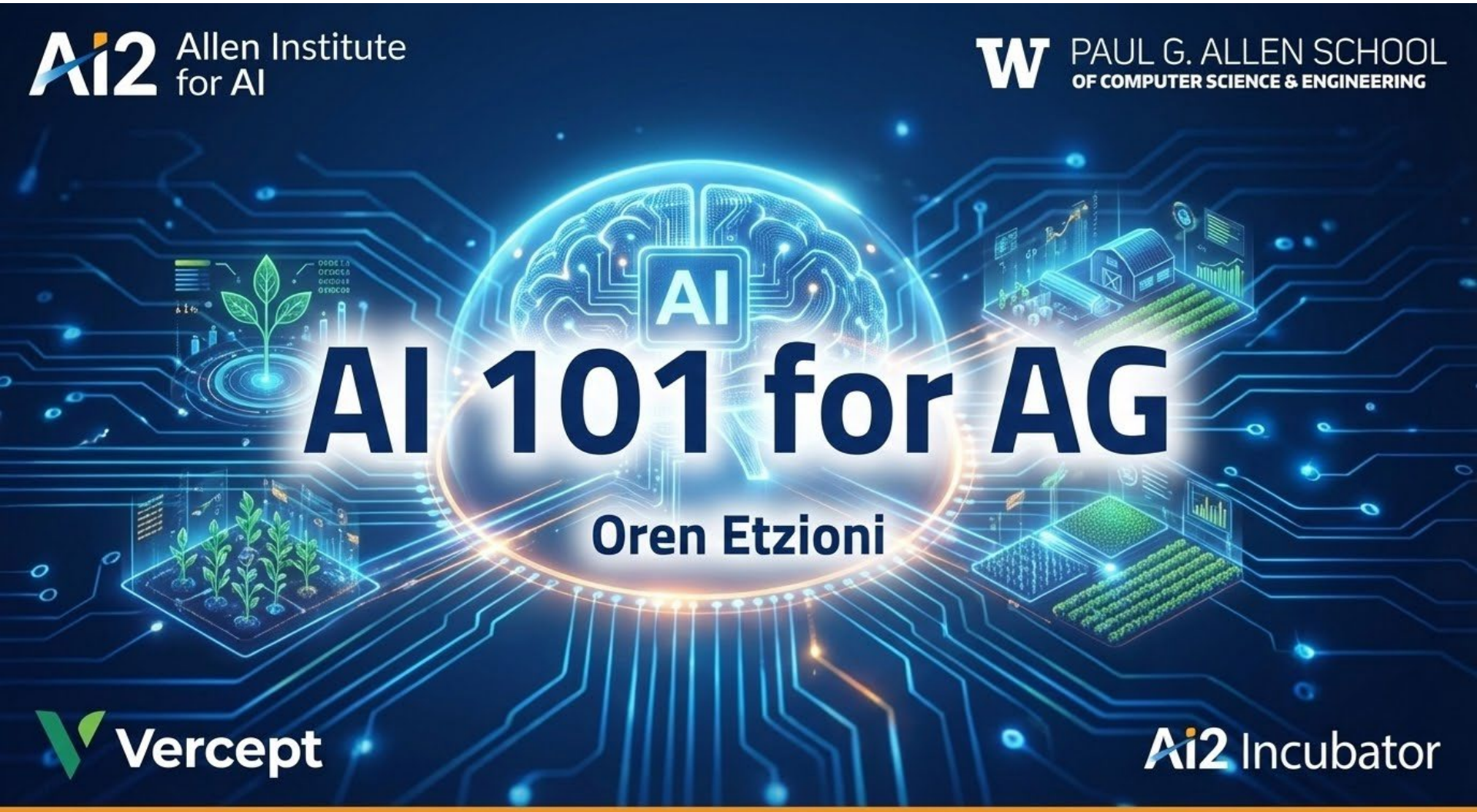
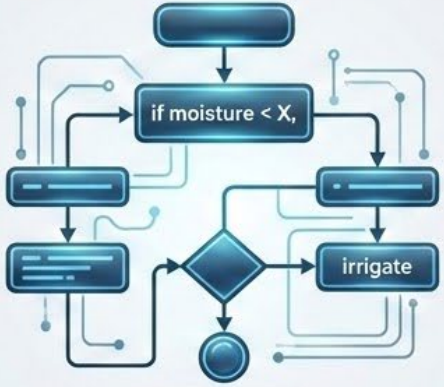

Allen Institute for AI
PAUL G. ALLEN SCHOOL
OF COMPUTER SCIENCE & ENGINEERING
AI
AI 101 for AG
Oren Etzioni
Vercept
Ai2 Incubator

# What Is AI (and Why It’s Different This Time)

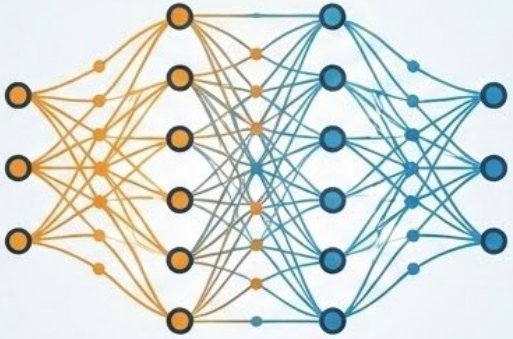
Point: AI learns patterns from data instead of following hand-coded rules

## Prior tech: deterministic rules




deterministic rules (“if moisture < X, irrigate”)

## AI: statistical learning



statistical learning that adapts as data changes

Key difference: **generalization** rather than fixed logic

Ag example: yield prediction models improving as more seasons are observed

# What Changed Recently (Why AI Took Off)

Point: Scale of data + compute + models crossed a threshold

## Massive Data Sets

Cheap sensors, satellites, drones → massive ag data

## Cloud GPUs + Neural Networks


Cloud GPUs + modern neural networks

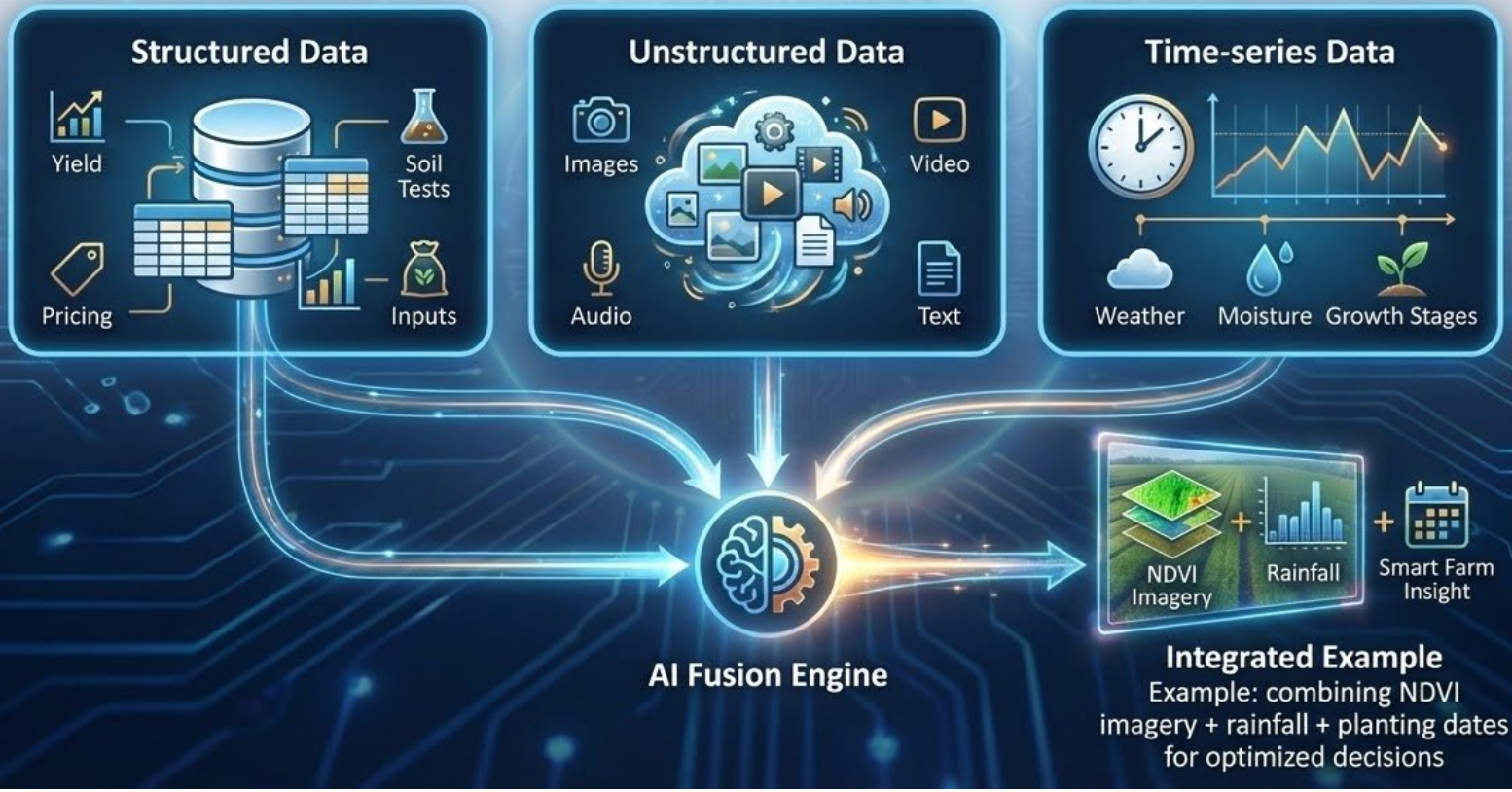
## Multi-Task Models

Models now work across tasks, not just one


Threshold

# What Types of Data Can AI Ingest?

Point: AI can ingest nearly all data types



# Key AI Categories (Plain English)

Point: Not all AI does the same thing

## Predictive

forecasts outcomes (yield, disease risk)

## Classification


labels things (healthy vs stressed)

## Generative


creates content (plans, summaries, simulations)

## Example


Disease Classifier

VS

Generative Crop-Rotation Advisor

Example: disease classifier vs generative crop-rotation advisor

# What AI Enables Next (Near-Future)

Point: AI moves from analysis → decision support → partial autonomy

## Field-level digital twins

virtual replicas for monitoring & testing

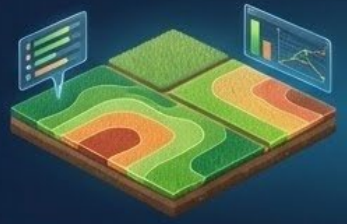
## Scenario simulation


predicting outcomes of different choices

## Adaptive machinery and robotics

machines that adjust to real-time conditions

## Example



VS


Example: AI simulating fertilizer tradeoffs before application

# Key Risks We Must Mitigate

Point: AI can fail silently and confidently

### Poor or biased training data


results from incomplete or unrepresentative inputs

### Over-generalization across regions/crops


models fail when applied outside their training context

### Automation bias ("the model said so")

uncritical over-reliance on automated outputs

### Example


Example: disease model trained in Iowa misapplied in California

# Workforce Impacts (Realistic Framing)

Point: AI changes tasks, not just jobs

**Less manual scouting, more interpretation**

shift from physical labor to data analysis

**New roles: data-literate agronomists, tech operators**

emerging specialized positions

**Need for training, not replacement panic**

focus on upskilling and adaptation

**Example**

Example: scout augmented by drone + AI alerts

# Partnering with the AI Community

Point: Agriculture must shape AI, not just adopt - it

Farmers provide ground truth & domain insight

real-world data & agricultural expertise

AI researchers provide methods & scale


advanced algorithms & computational power

Co-development beats vendor black boxes


transparent, collaborative model creation

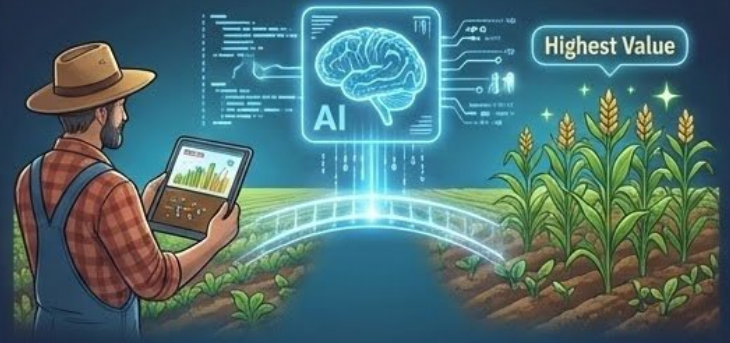
Example: shared datasets, pilot programs, open benchmarks

collaborative resources & performance standards

# AI is a powerful tool—not a silver bullet

Point: Realizing the full potential of AI in agriculture

## Pairing AI with Agronomic Expertise




Highest value comes from human insight + machine intelligence

## Trust, Transparency, & Partnership


Foundations for successful outcomes and adoption