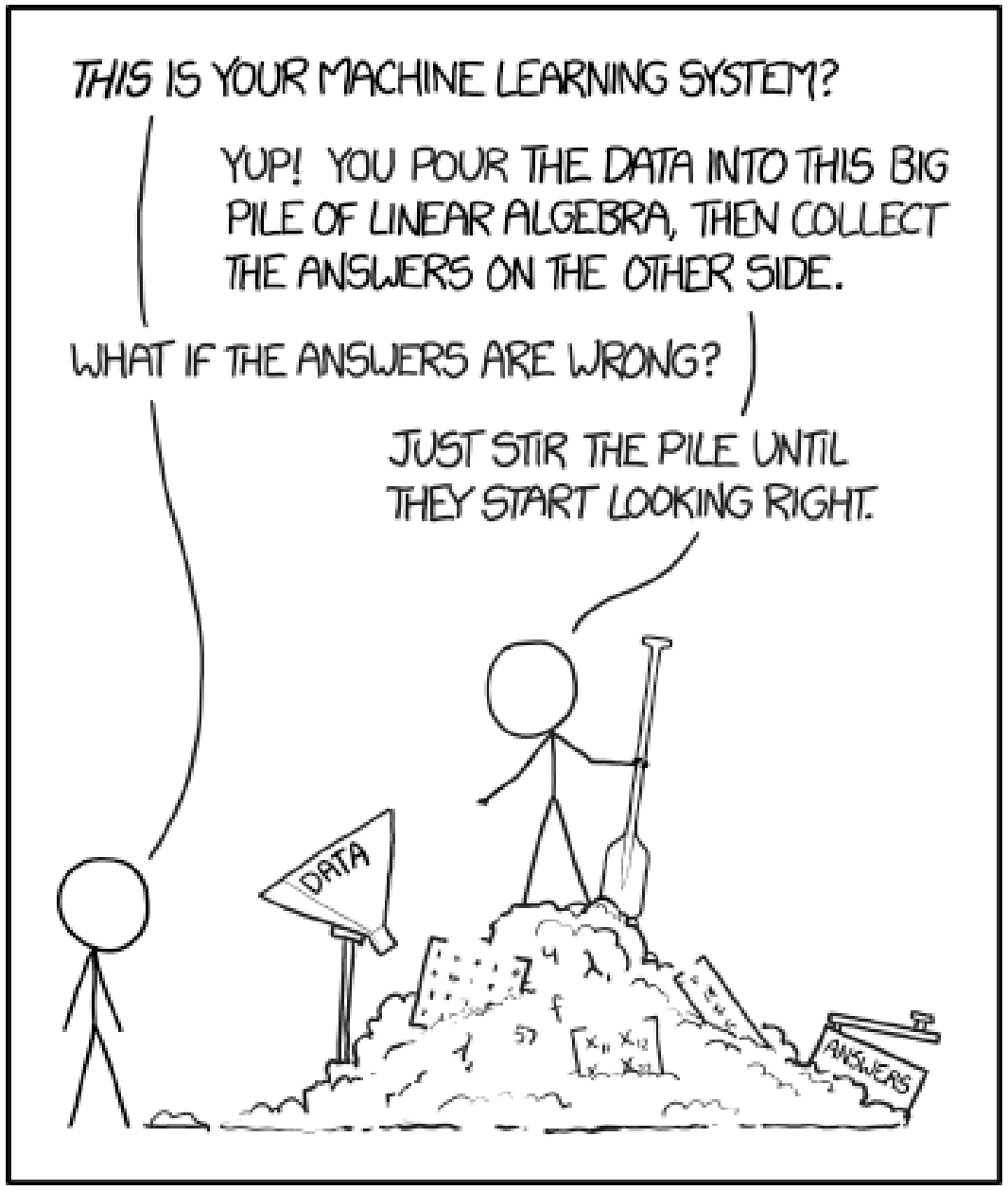
PROJECT  bonsai

From Automation to Autonomous Systems

Presented by Barkha Herman


THIS IS YOUR MACHINE LEARNING SYSTEM?
YUP! YOU POUR THE DATA INTO THIS BIG PILE OF LINEAR ALGEBRA, THEN COLLECT THE ANSWERS ON THE OTHER SIDE.
WHAT IF THE ANSWERS ARE WRONG?
JUST STIR THE PILE UNTIL THEY START LOOKING RIGHT.
DATA
ANSWERS

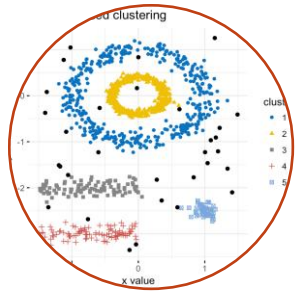
AI JOURNEY SO FAR...

Is it a Cat or a Dog? Classification Problem

Rain or Sunshine? Prediction Problem

Fraud?

Anomaly Detection



What Group?

Clustering Problem

DRL – HOW IS IT DIFFERENT?

Supervised Learning

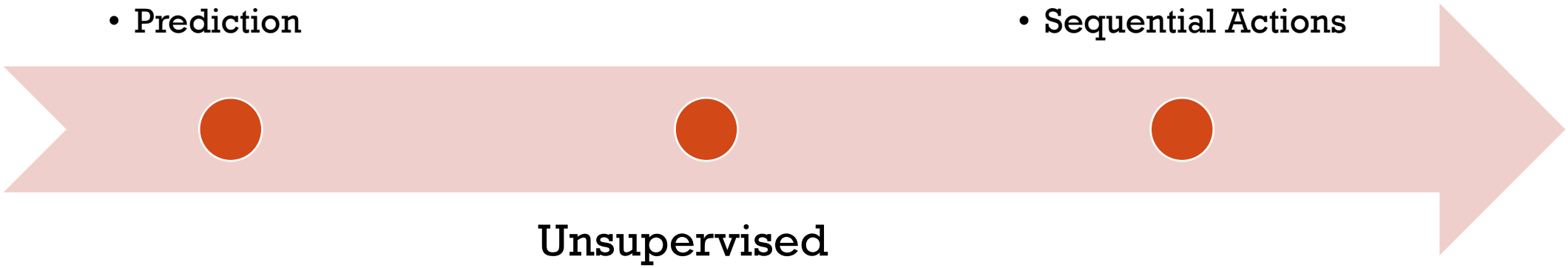
- Classification
- Prediction

Unsupervised Learning

- Anomaly Detection
- Clustering

Reinforcement Learning

- Sequential Actions



WHAT IS THE DIFFERENCE?

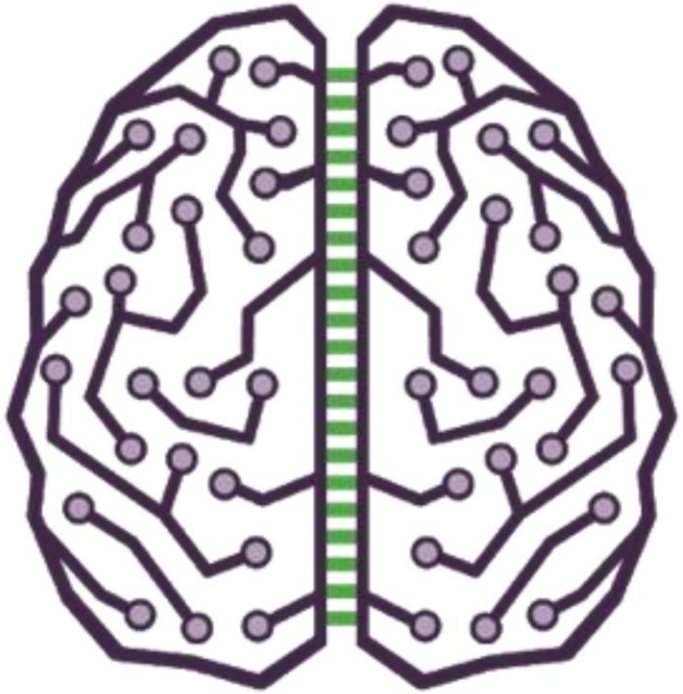
Supervised & Unsupervised Learning

- Based on Big Data
- Output is % Prediction

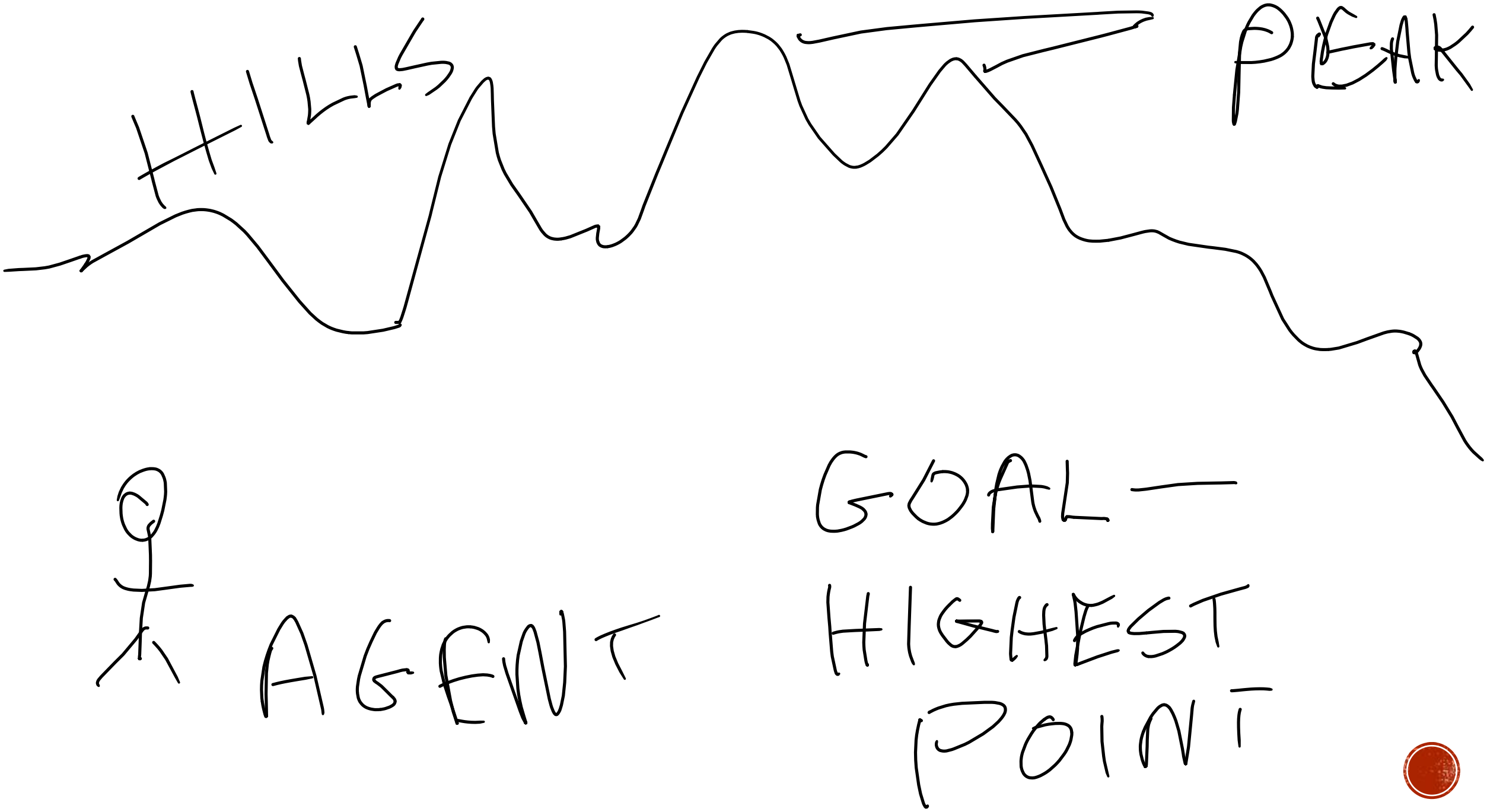
Reinforcement Learning

- Based on Environment & Agent
- Output is Next Action

THE BONSAI BRAIN

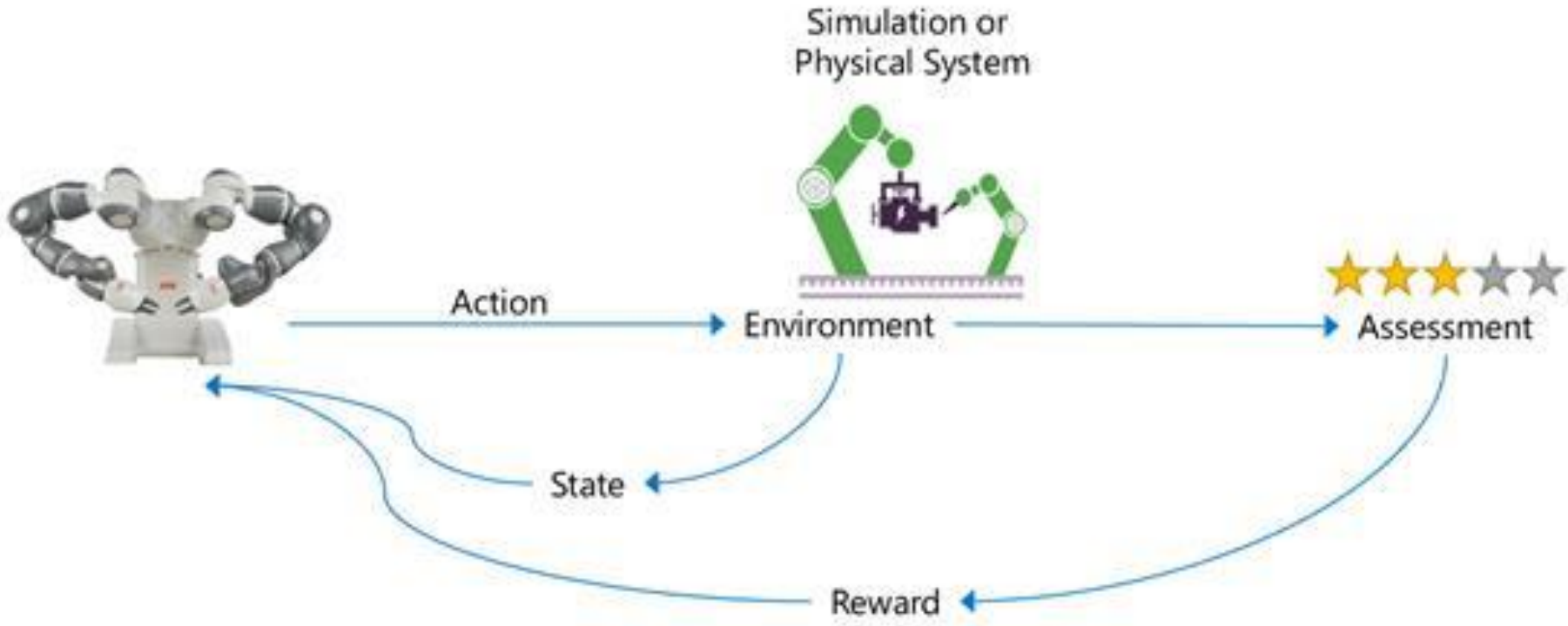


- High-level model built by combining techniques in:
  - Deep reinforcement learning (DRL) simulations
  - Machine teaching
  - Used to generate optimization and control actions

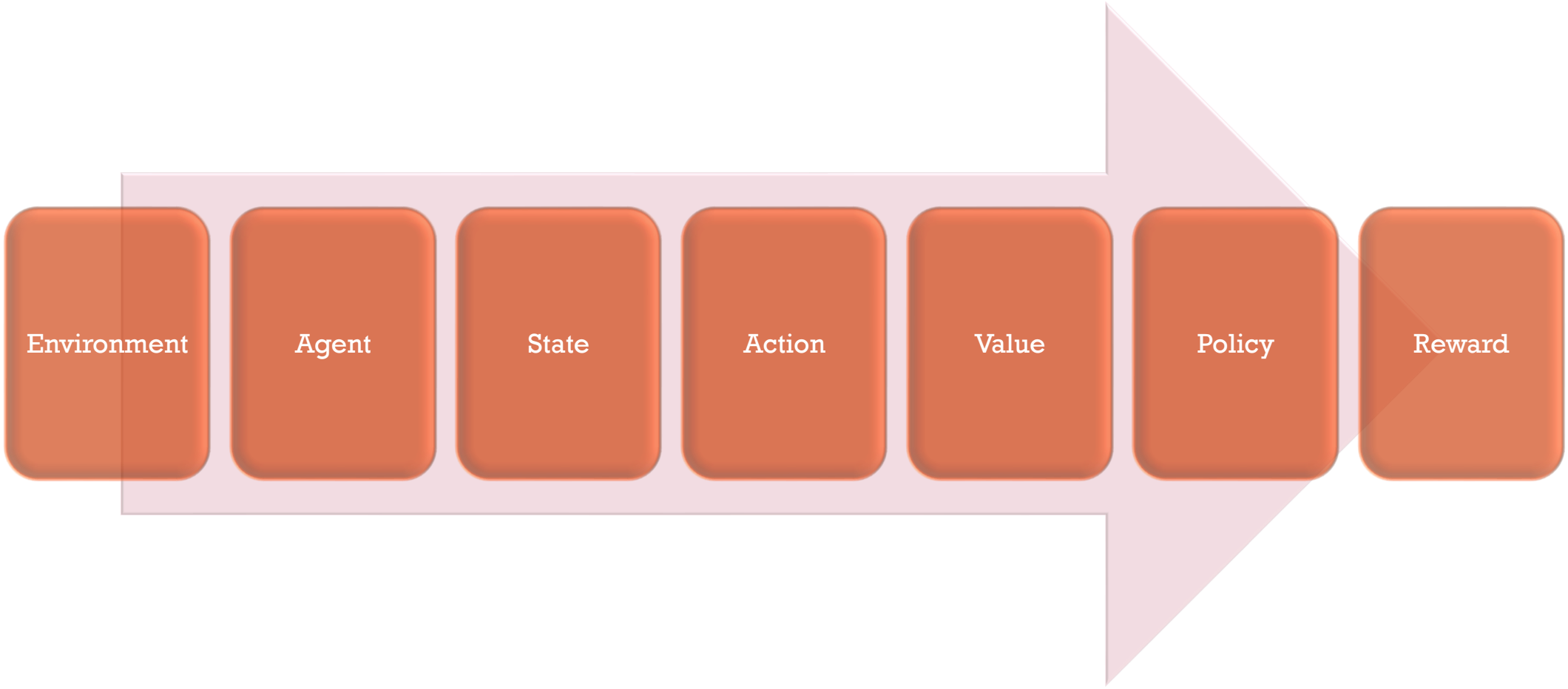

HILLS
PEAK
AGENT
GOAL—
HIGHEST
POINT

Deep Reinforcement Learning – Key Components

Learning by practicing in a real or simulated environment

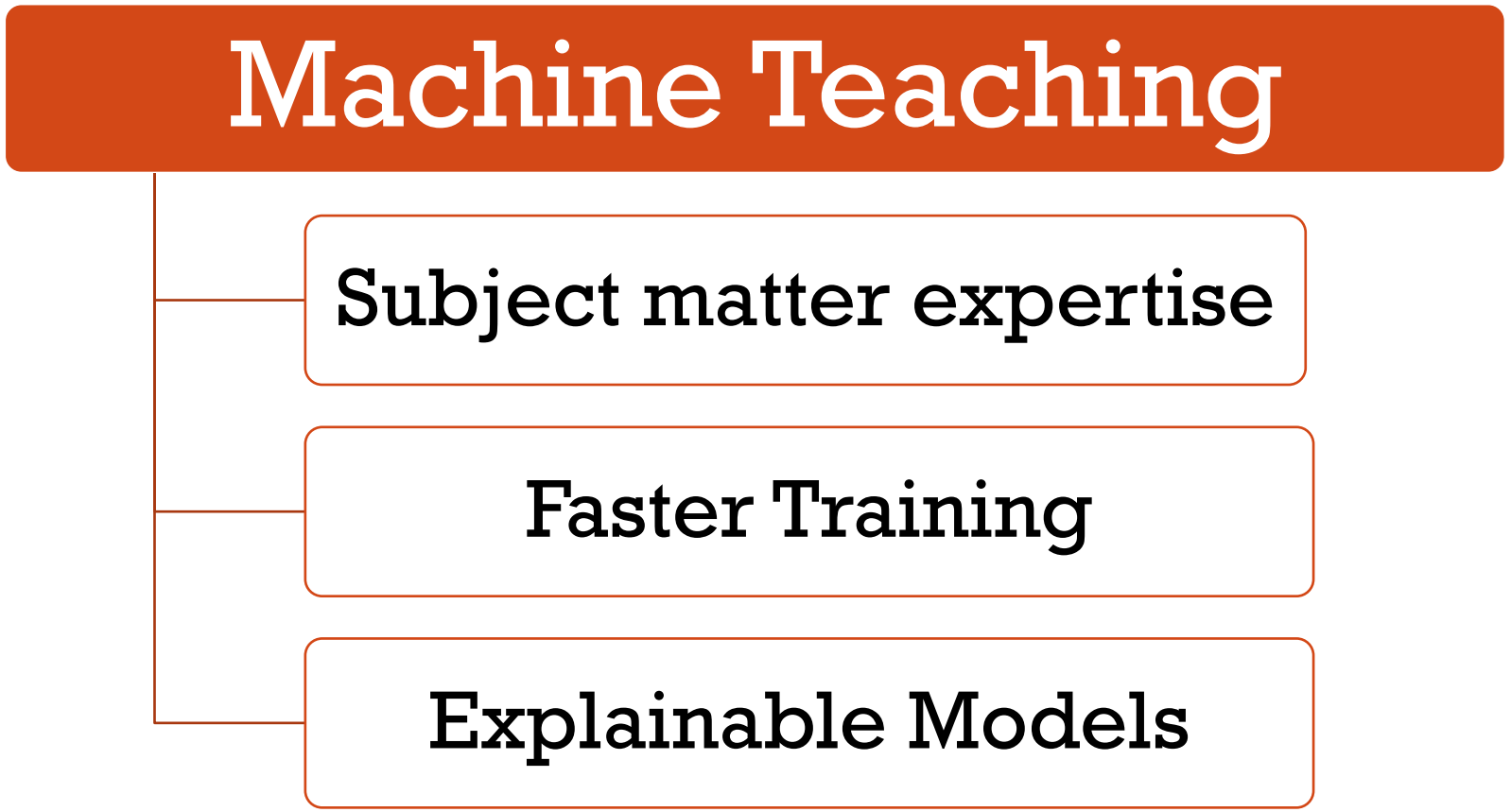


REINFORCEMENT LEARNING



DRL ATARI VIDEO

MACHINE TEACHING

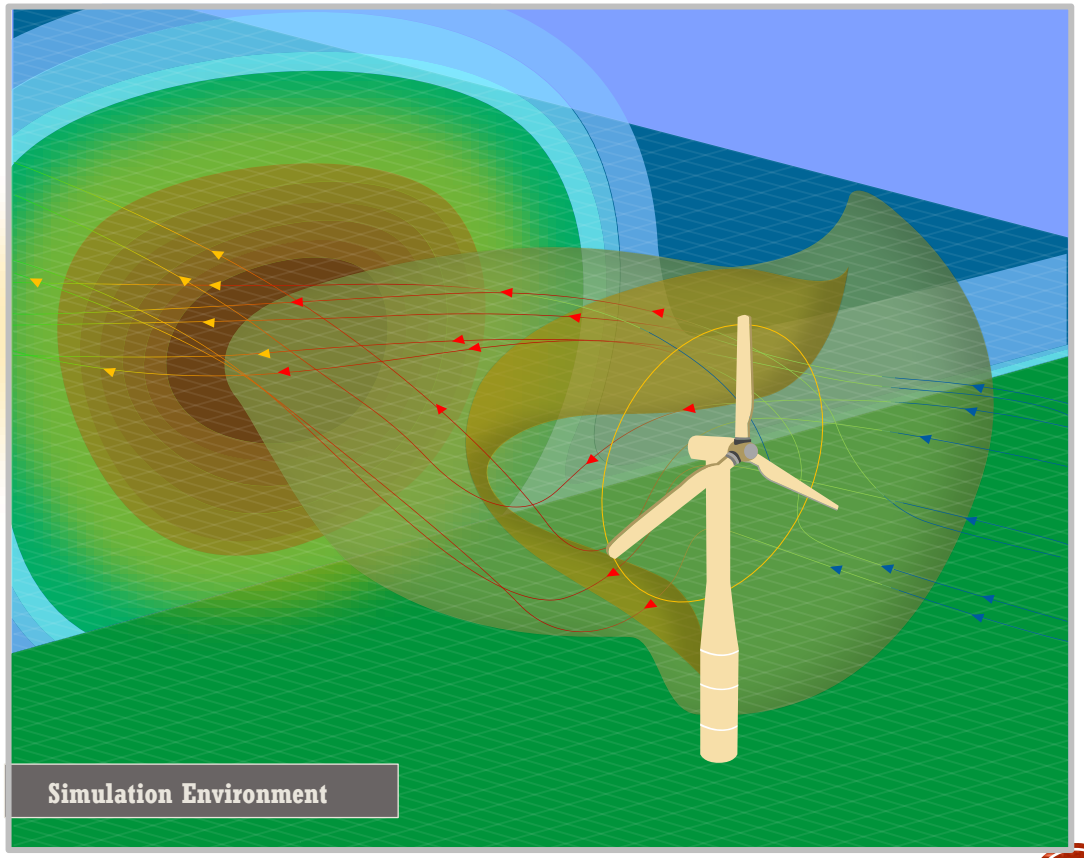


SIMULATIONS PROVIDE A SAFE AND SCALABLE TRAINING ENVIRONMENT

Safe and cost-effective data generation

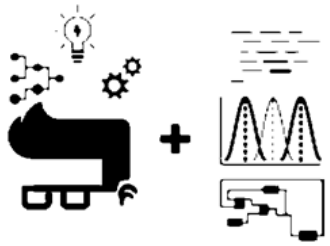
Flexible to your custom environment

Faster training times with sim parallelization

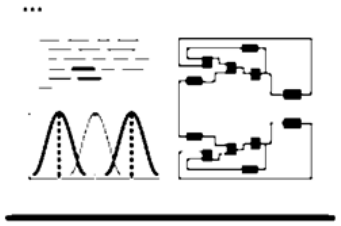


BONSAI SERVICE

1. Machine Teaching injects subject matter expertise into brain training

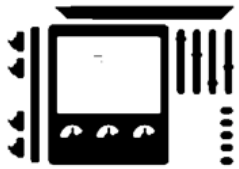


2. Simulation tools for accelerated integration and scale of training



bonsai

3. AI Engine automates the generation and management of neural networks and DRL algorithms

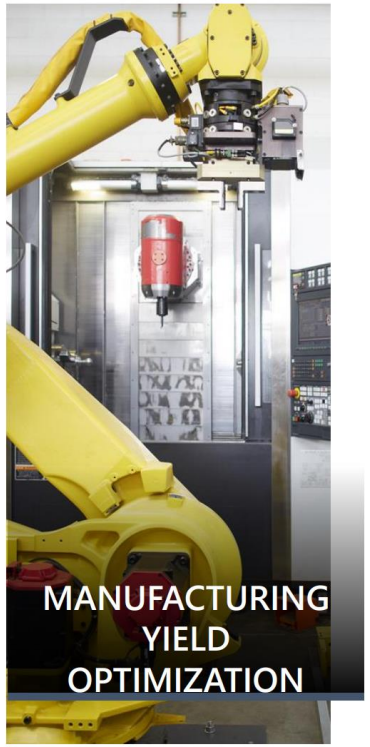
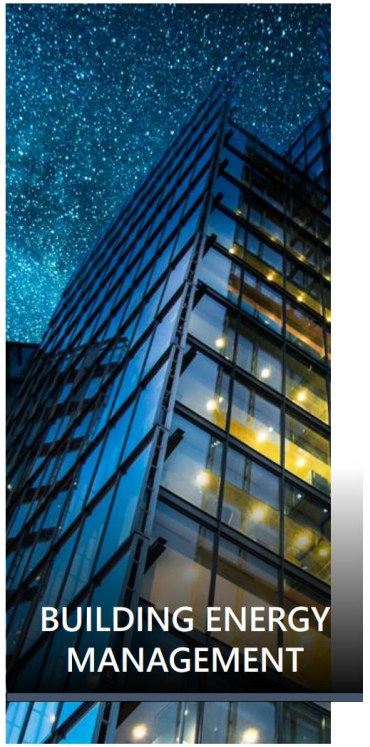


4. Flexible runtime to deploy and scale models in the real world

DEMO

- …

WHERE IS BONSAI BEING USED?

				
Industries	Discrete Manufacturing, Mining, CPG, Pharma, Automobile, Retail, Medtech	Continuous Manuf, Oil and Gas, Pharma, Chemical & AgroChemicals	Smart Building/ City, CPG/ Retail, Healthcare, Manufacturing, Public Sector, IT	Discrete and Process Manufacturing, CPG/Retail, Energy Transportation
Example Customers	Pepsi	SCG	Microsoft	Delta Airlines

QUESTIONS?

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RESOURCES

- Aka.ms/bonsai
- https://www.microsoft.com/en-us/ai/autonomous-systems-project-bonsai-how-it-work
- Internal: How Project Bonsai works (microsoft.com)
- Docs: Bonsai documentation - Bonsai | Microsoft Docs
- Learn: Introduction to Microsoft Project Bonsai - Learn | Microsoft Docs
- YouTube: Microsoft Project Bonsai - YouTube