

# The AI Advantage

Putting Artificial Intelligence to Work for  
You in Risk and Compliance

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# Risk and Compliance State of Play

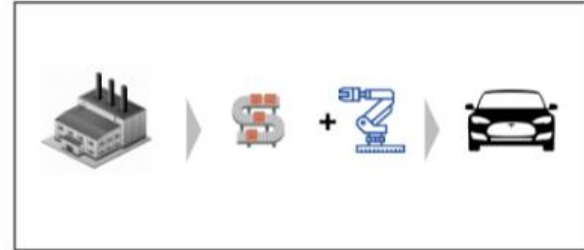
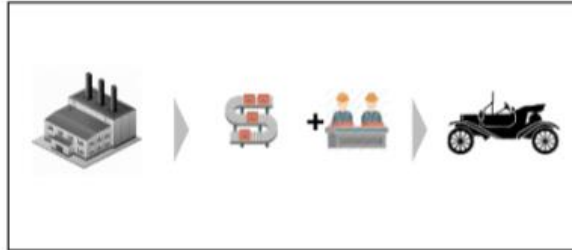
# Automation of Building Knowledge

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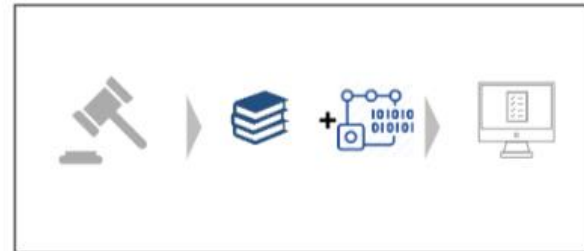
Before Automation

After Automation

Production of  
Automobiles



Production of  
Knowledge



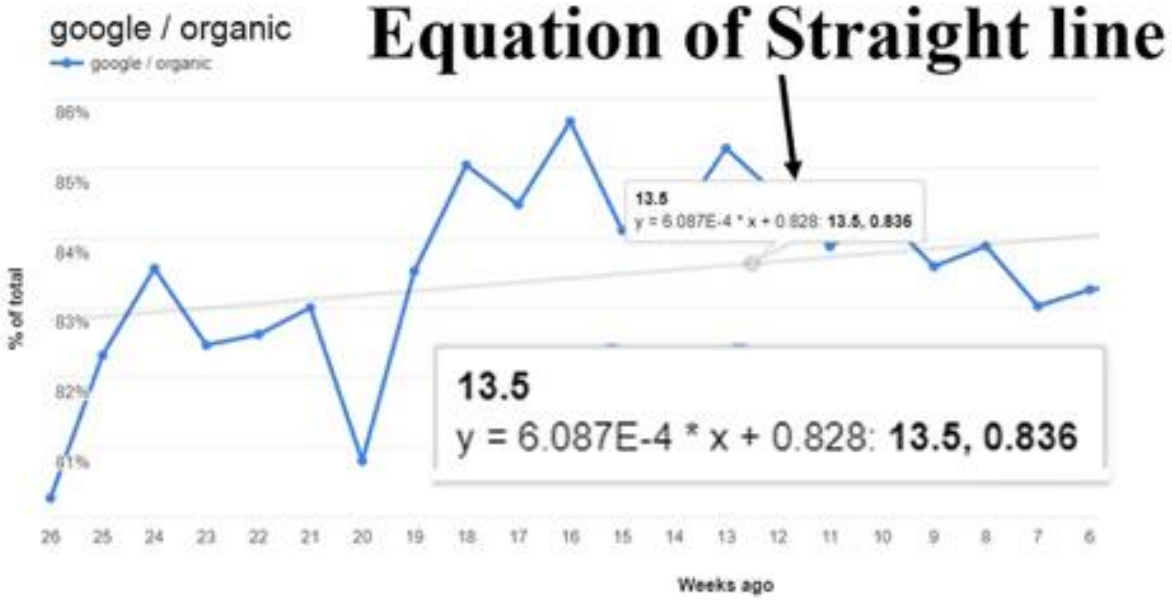
# What AI Is and What It Isn't

# The Definition of AI

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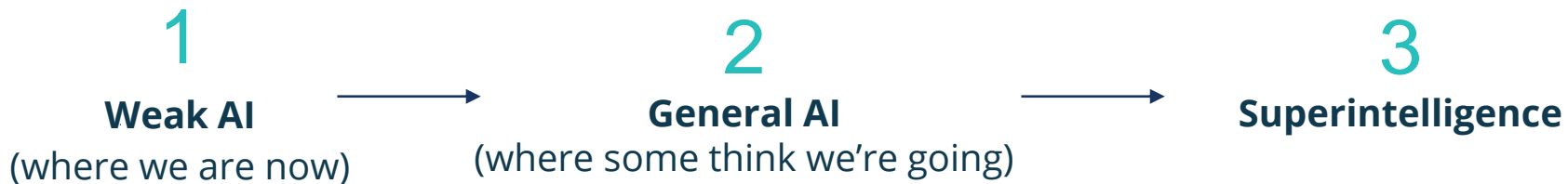
- **A branch of computer science** dealing with the simulation of intelligent behavior in computers
- **The capability of a machine** to imitate intelligent human behavior

# Hype vs. Reality: $Y = MX + B$



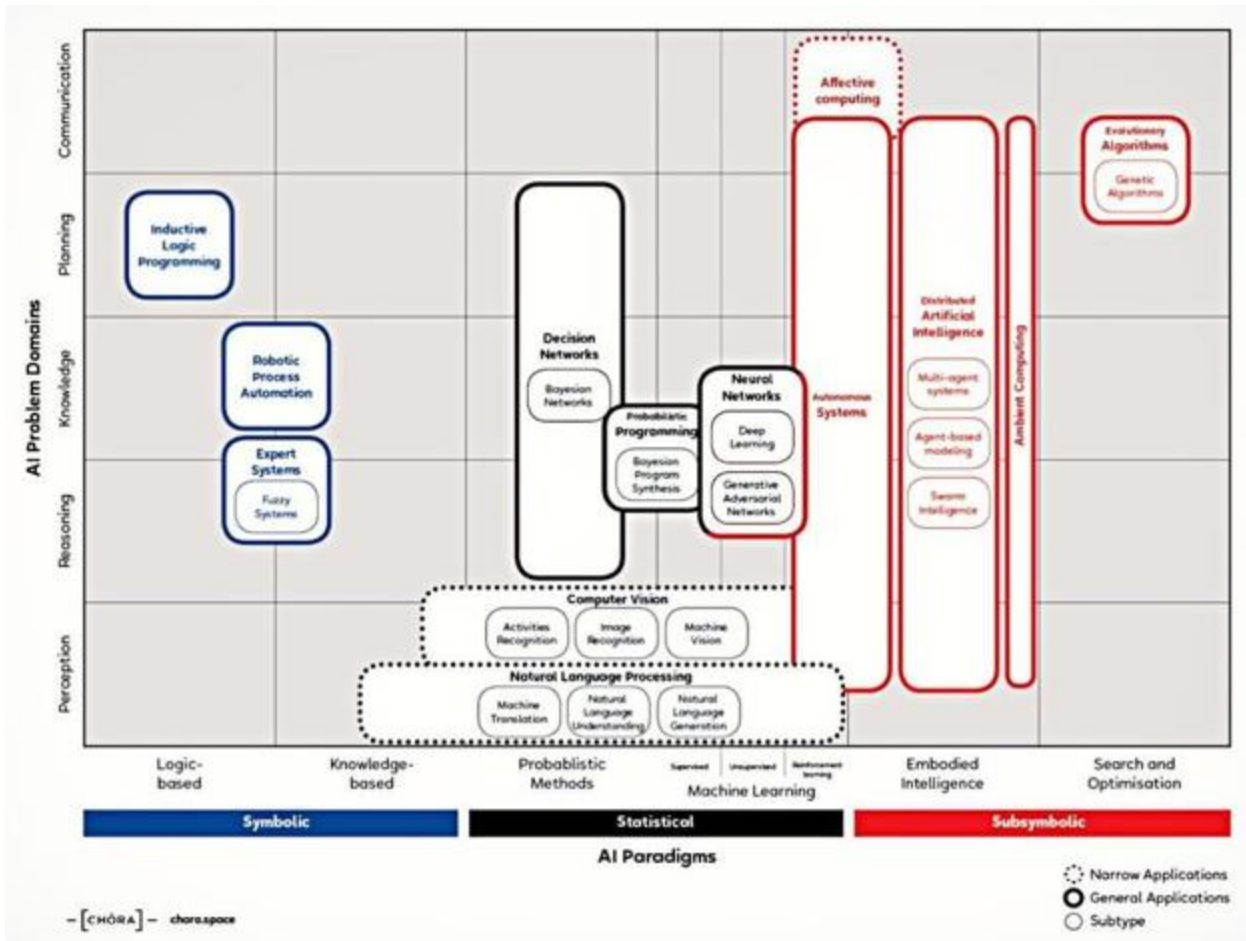
# Types of AI

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## Current practical applications:

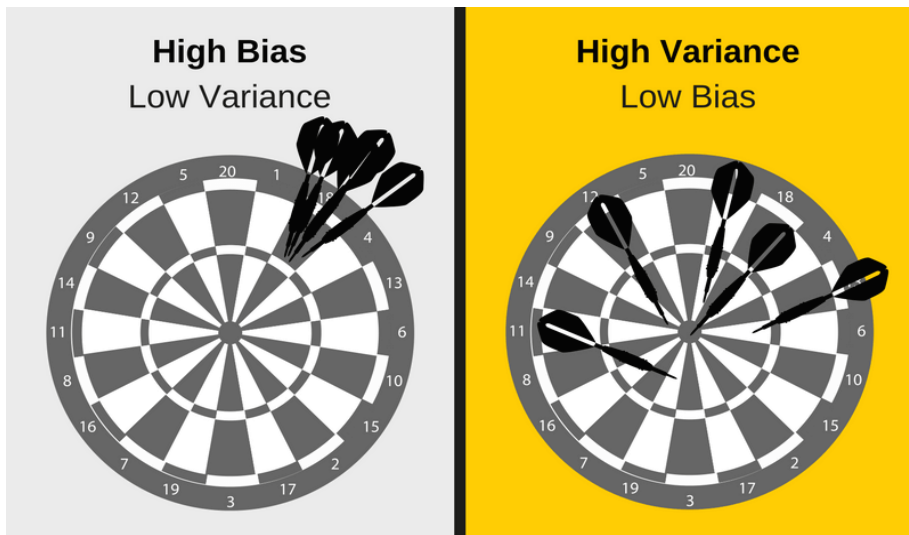
- Supervised Learning (most Machine Learning today)
- Unsupervised Learning (Clustering)
- Reinforcement Learning
- Machine Vision
- Natural Language Processing (turning words into numbers)





# The Variance / Bias Tradeoff

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**High bias**, low variance algorithms train models that are consistent, but inaccurate *on average*.

**High variance**, low bias algorithms train models that are accurate *on average*, but inconsistent.

# General vs. Domain AI

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## General AI

- More variables
- More variance
- More complicated

## Domain AI

- Fewer variables
- More constrained sets of data
- More training data
- Currently easier to provide solutions

**Beware** the Jack-of-All-Trades solution

# The Legality, Regulation and Ethical Issues of AI

# Current Regulation of AI

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- Developing field...



- No consensus on Regulation of AI
- We *do* have indications of managing model decision-making

# Regulation of AI

## The OCC Framework

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Adopted by FDIC, FRB

- Model Development, Implementation, and Use
- Model Validation
  - Evaluation of Conceptual Soundness
  - Ongoing Monitoring
  - Outcome Analysis
- Governance, Policies, and Controls

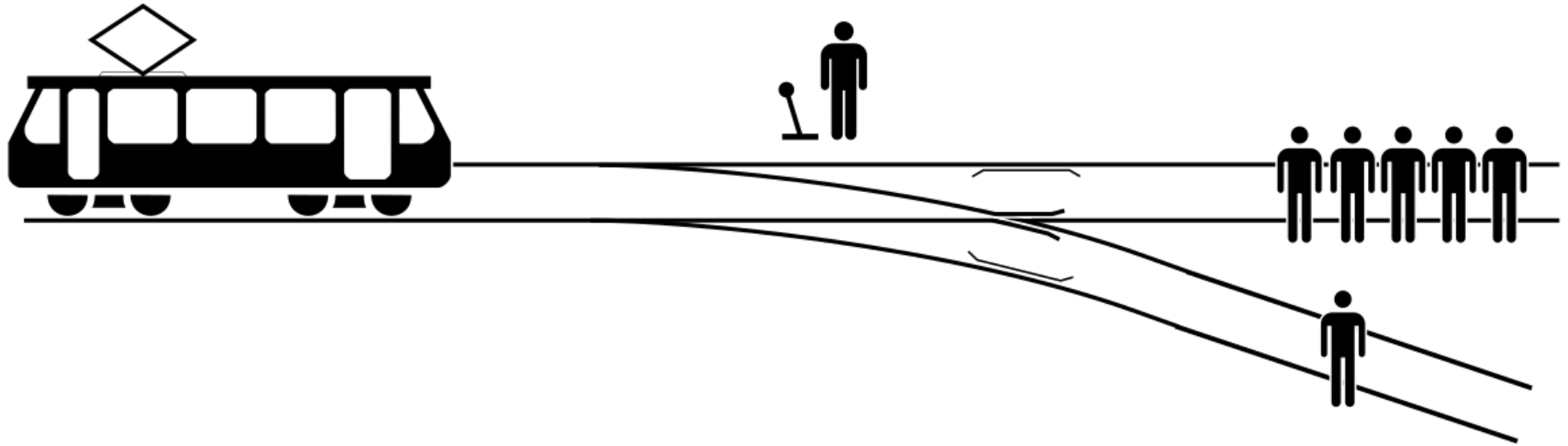
# Ethical Challenges in AI

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1. Human vs. Machine Judgment
2. Societal
  - “This will automate *everything*”
  - Employment Disruption
  - Optimism Bias
3. Model Bias – Compliance Examples
  - Trade Activity Algorithm
  - Credit Worthiness Model
  - Risk Algorithm
4. Unintended Consequences

# The Core Ethical Conundrum

Human vs. Machine Judgement



# Societal Issues in AI

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- Employment
  - AI is “Enabling Technology”
  - Similarity to the computing boom of the 80s and 90s
- Inequality
  - Increasing returns to the best algorithm
  - War of the Data Model
- Unrealistic Optimism
  - “This will solve *everything*”



# AI Model Bias

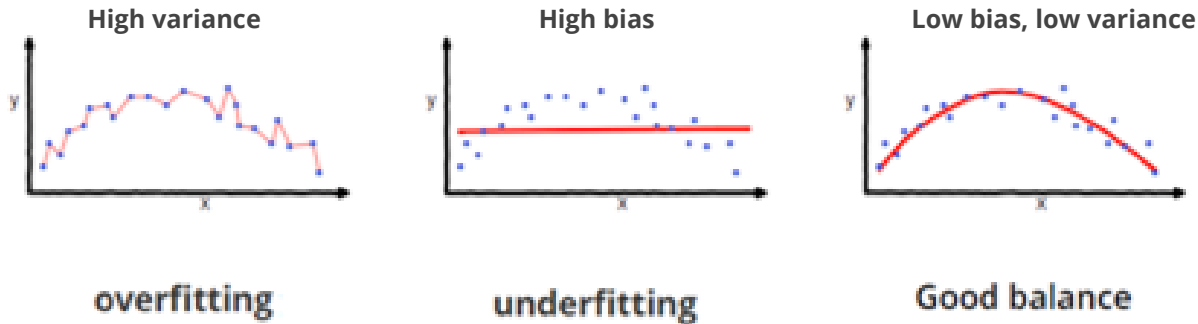
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- Bias: an algorithm that “might find the wrong patterns”
  - Hidden bias in difficult systems
  - Assumptions based on incomplete or bad data
- Making decisions with improper assumptions

# Bias: Risks and Unintended Consequences

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- Additional Risks: Overfitting / Memorization Models



- Unintended Consequences: Model Source Liability – The generator of a model will be held to increasingly stricter outcomes

*Connecting this to the Law...*

# Operationalizing AI: What Does It Mean For You?

# Agency of Decision Making

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**The Key Question:**

***Who*** bears the responsibility?

# Embedding Controls and Processes

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- Compliance by Design is not Ethical by Design
- Intention in Code (comments in your code may signal “intent”)
- Use relevant regulatory frameworks to de-risk usage (e.g. OCC / FRB)
- Transfer your labor force from generating knowledge to quality controlling knowledge

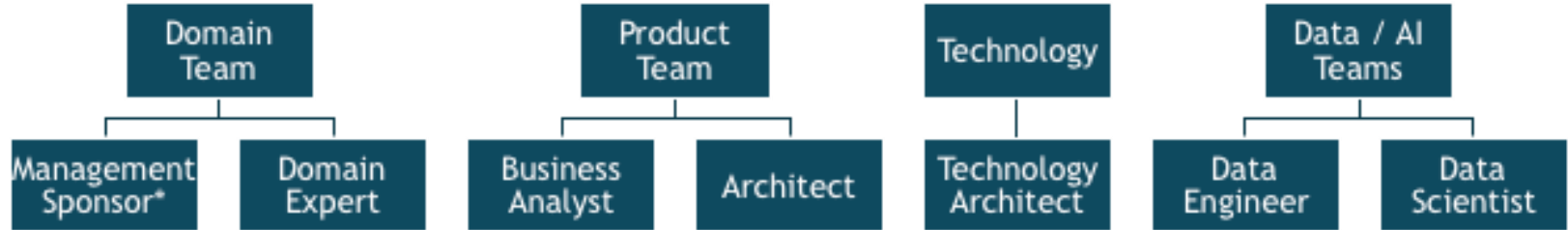
# Internal Resources

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- Organizational Change Design
- Technology
- Data Science / Analytics
- Clean Data

# Agency of Decision Making

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*\*the one with the problem*

# Support from Management

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# Practical Considerations and Best Practices

# State of the Industry

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- Ascent: A RegTech case study in domain AI
- Ripe for automation: Repeatable knowledge processes (RKPs)

# Best Practice #1

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- Don't compare quality outcomes to Human Outputs (Confirmation Bias)



# Best Practice #2

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- Augmented Intelligence: Keep humans in the loop
  - Empower your labor force to control quality
  - Constantly review your inputs and controls
  - Use proper training data

# Best Practice #3

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- Understand the inputs to understand the outputs
  - Eliminate all forms of bias, at all costs (understand the data set you're drawing from)
  - Identify risks and biases up front
  - Communicate appropriate risks/rewards to domain stakeholders

# Predictions about AI in Risk & Compliance

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1. Machine Learning & Natural Language Processing **will be normalized** for students the way computers are normalized today
2. Computers **will empower humans** and **give rise to the age of augmented intelligence**, rather than replace all knowledge work
3. AI will **help firms be *more* compliant by allowing them to focus on gaps**, instead of repeatedly analyze situations



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