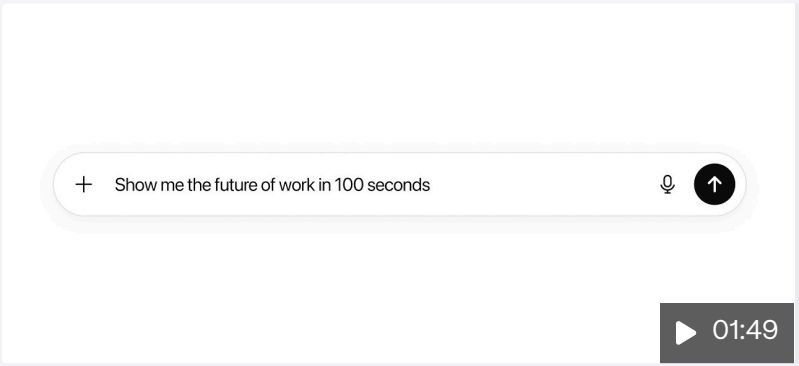
Artificial Intelligence (AI) as a Work Productivity Tool

Asst. Prof. Dan Anthony Dorado
UP School of Library and Information Studies
Data Librarians Special Interest Group

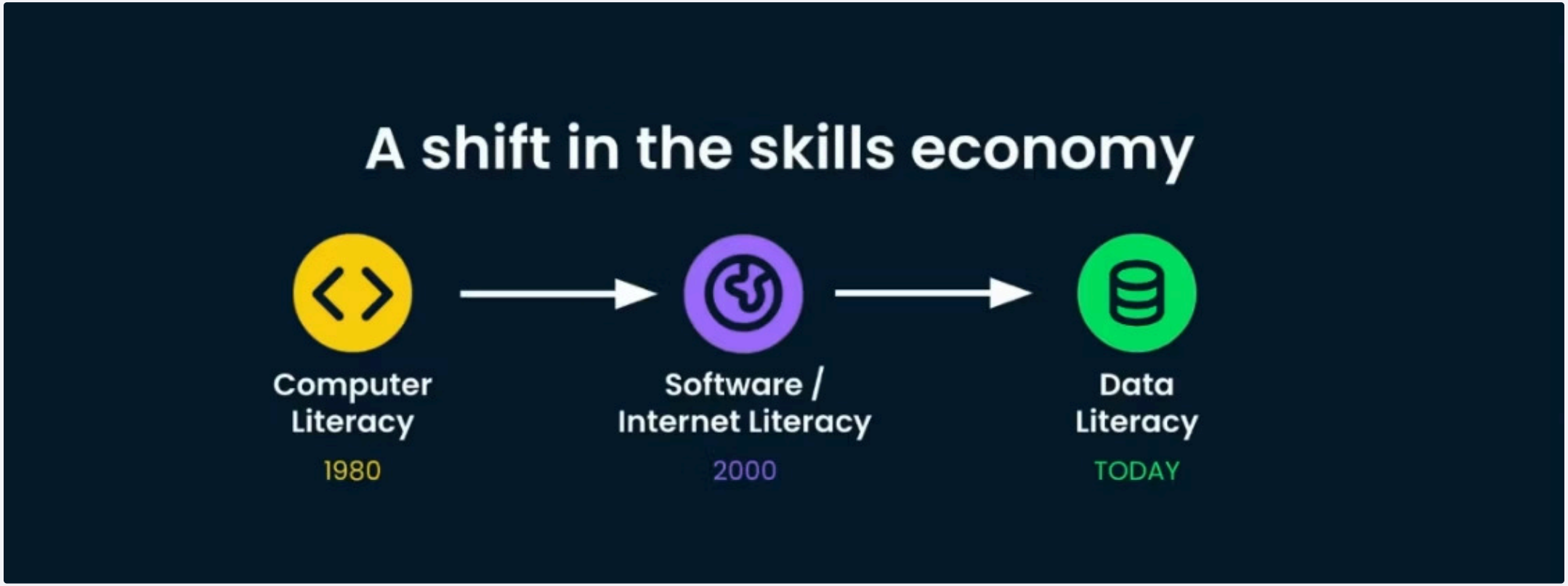


YouTube

What Work Looks Like with ChatGPT | Write, Research, Code, Create

ChatGPT is becoming a bigger part of everyday work. It helps teams move from idea to execution faster, analyzing data, writing code, researching topics, and taking...

Major shifts in the past decades


A shift in the skills economy
Computer Literacy
1980
Software / Internet Literacy
2000
Data Literacy
TODAY

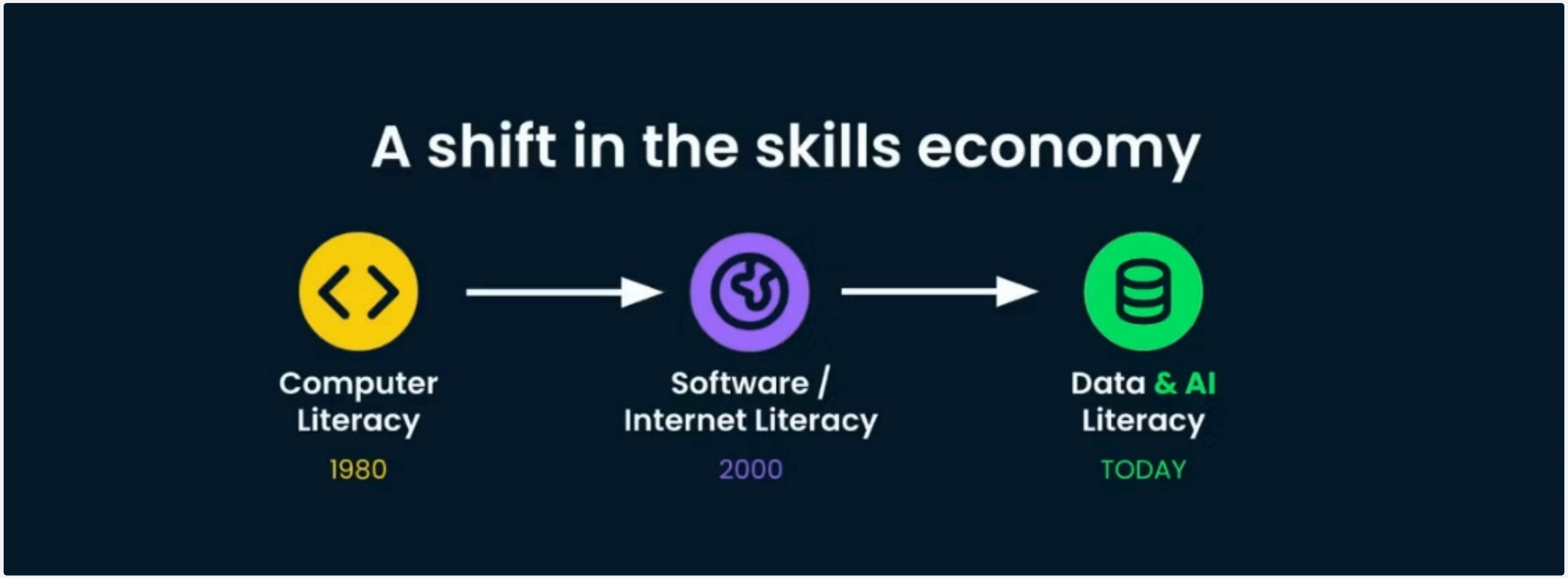
The moment we find ourselves in

Artificial Intelligence goes mainstream

2020s

TECHNOLOGY

ECOSYSTEM


A shift in the skills economy
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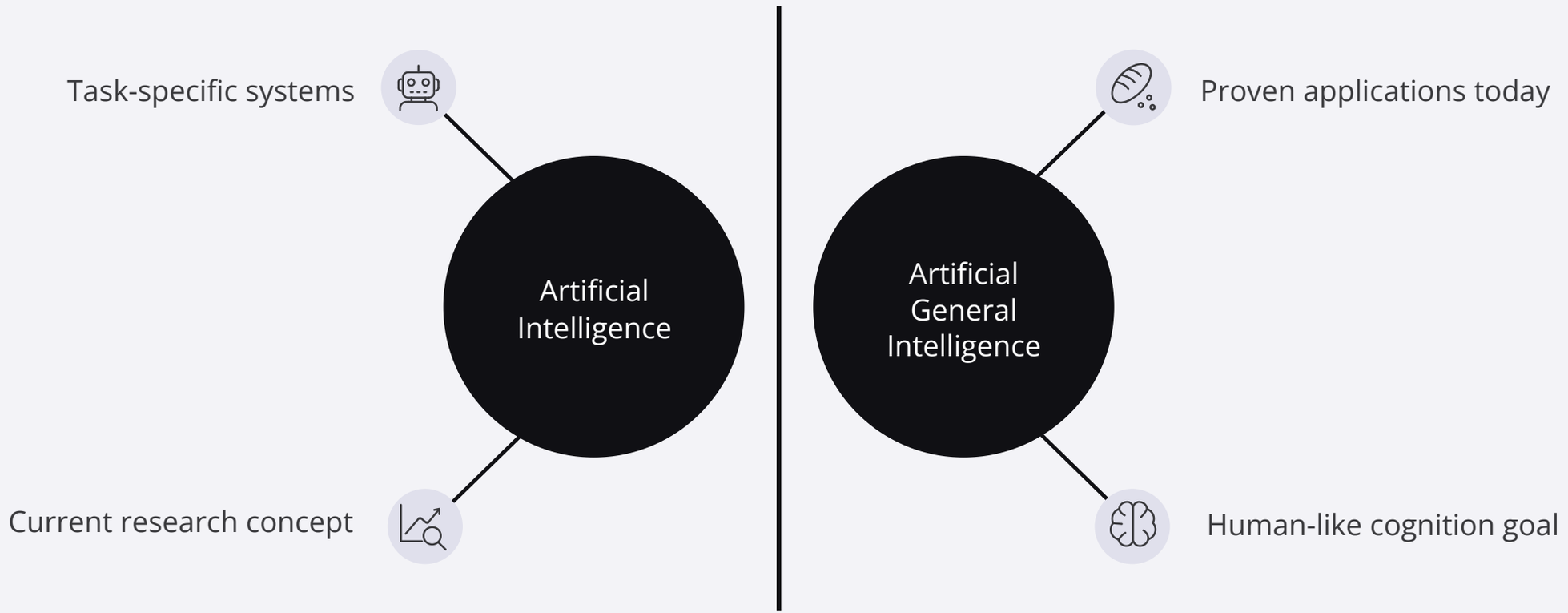
Data & AI Literacy
TODAY

AI vs. AGI: Understanding the Core Differences

While often used interchangeably, Artificial Intelligence and Artificial General Intelligence represent distinct levels of machine capability. Understanding this difference is crucial for navigating the evolving landscape of AI.



Today's AI excels at specialized tasks, making our lives easier and more efficient. AGI remains a theoretical pursuit, promising a future with machines capable of complex, human-like thought across various domains.

What Can AI Do?

Artificial Intelligence brings transformative capabilities that can redefine operations and services.

Prediction and Inference

Analyze data to forecast trends, anticipate user needs, and inform strategic decisions for resource acquisition.

Pattern Recognition

Identify hidden relationships in vast collections, categorize content, and discover emerging research topics for enhanced discovery.

Optimization

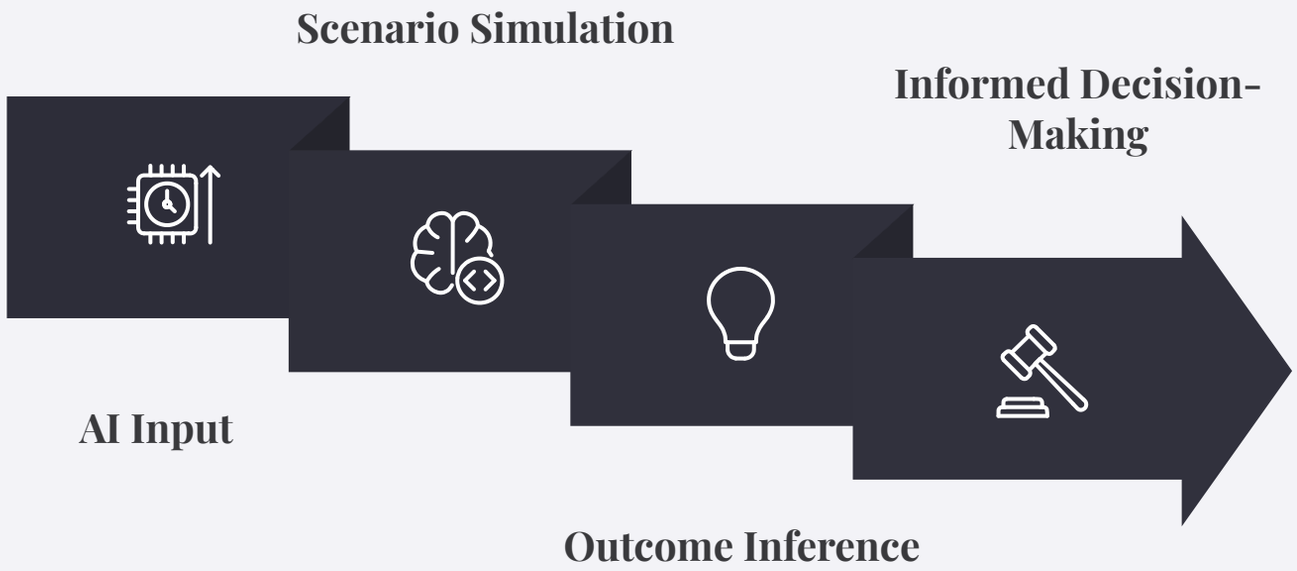
Streamline library operations from cataloging to resource management, ensuring maximum efficiency and accessibility of information.

Automation

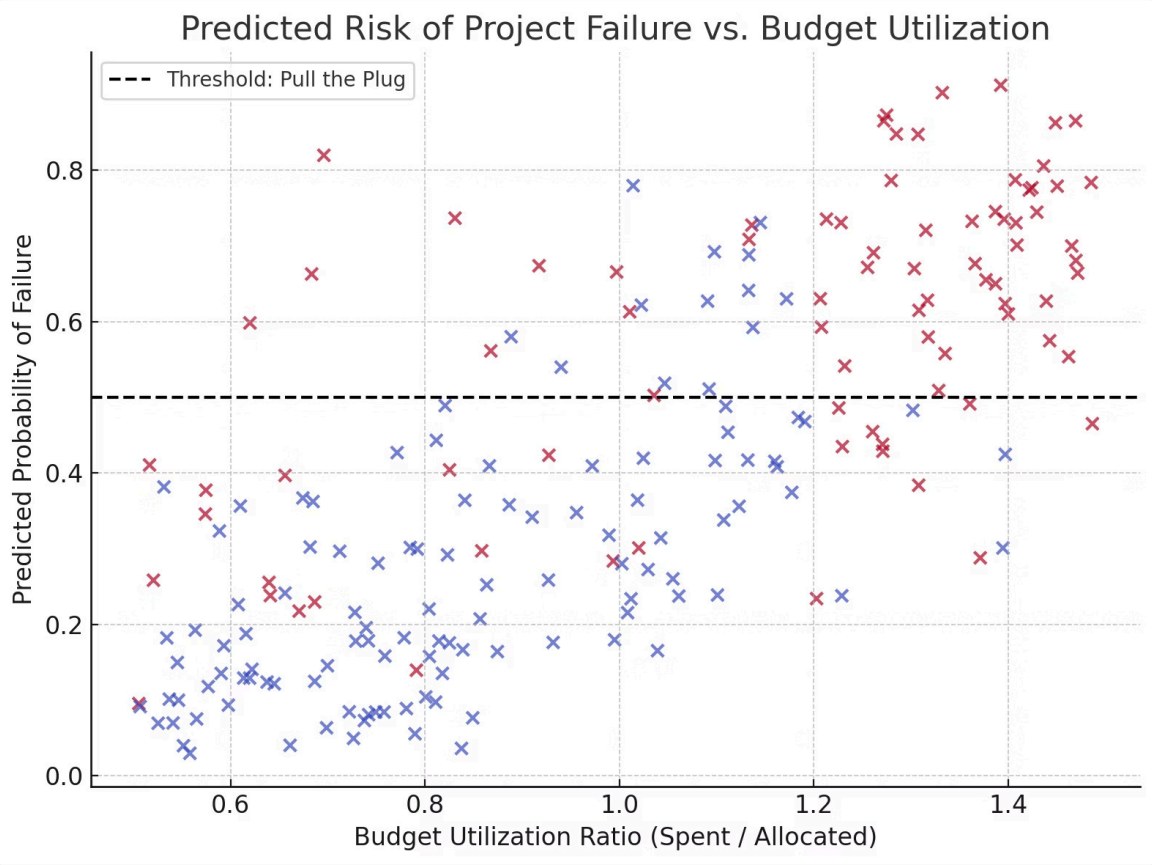
Automate routine and repetitive tasks like metadata generation, indexing, and loan processing, freeing staff for higher-value activities.

Prediction and Inference

AI enables the simulation of alternative budget scenarios and the inference of likely policy outcomes, significantly enhancing public budgeting decision-making. For instance, AI can model the impact of different funding levels on staffing, resources, and program outputs within specific units.

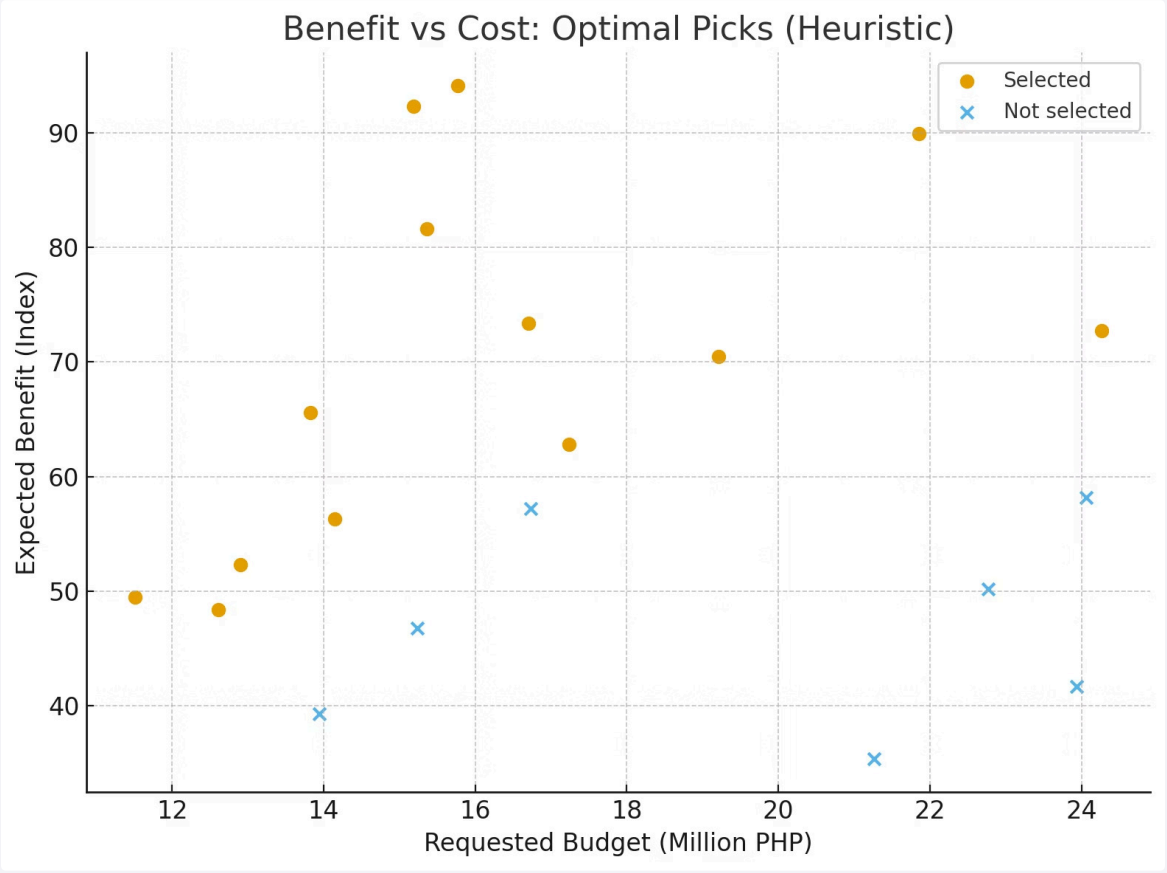


Pattern Recognition




WE OFFER 3 KINDS OF SERVICES
GOOD-CHEAP-FAST
BUT YOU CAN PICK ONLY TWO
GOOD & CHEAP WON'T BE FAST
FAST & GOOD WON'T BE CHEAP
CHEAP & FAST WON'T BE GOOD

Optimization



Automation

YouTube

NVIDIA Cosmos: A World Foundation Model Platform for Physical AI

The next frontier of AI is physical AI. NVIDIA Cosmos™—a platform of state-of-the-art generative world foundation models, advanced tokenizers, guardrails, and an...

Limitations of AI

Social skills: emotional intelligence, empathy

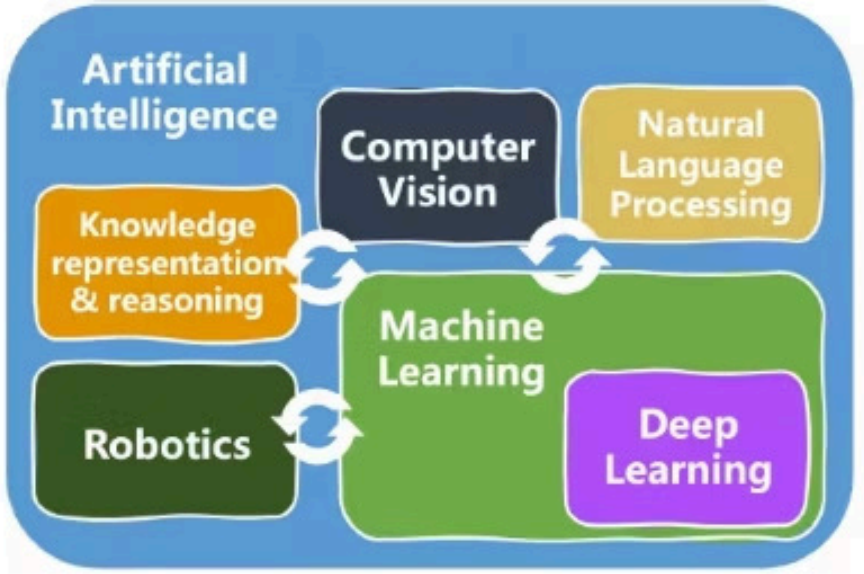
Bias: making unfair decisions to some groups

New, unseen situations, e.g. new items to recommend

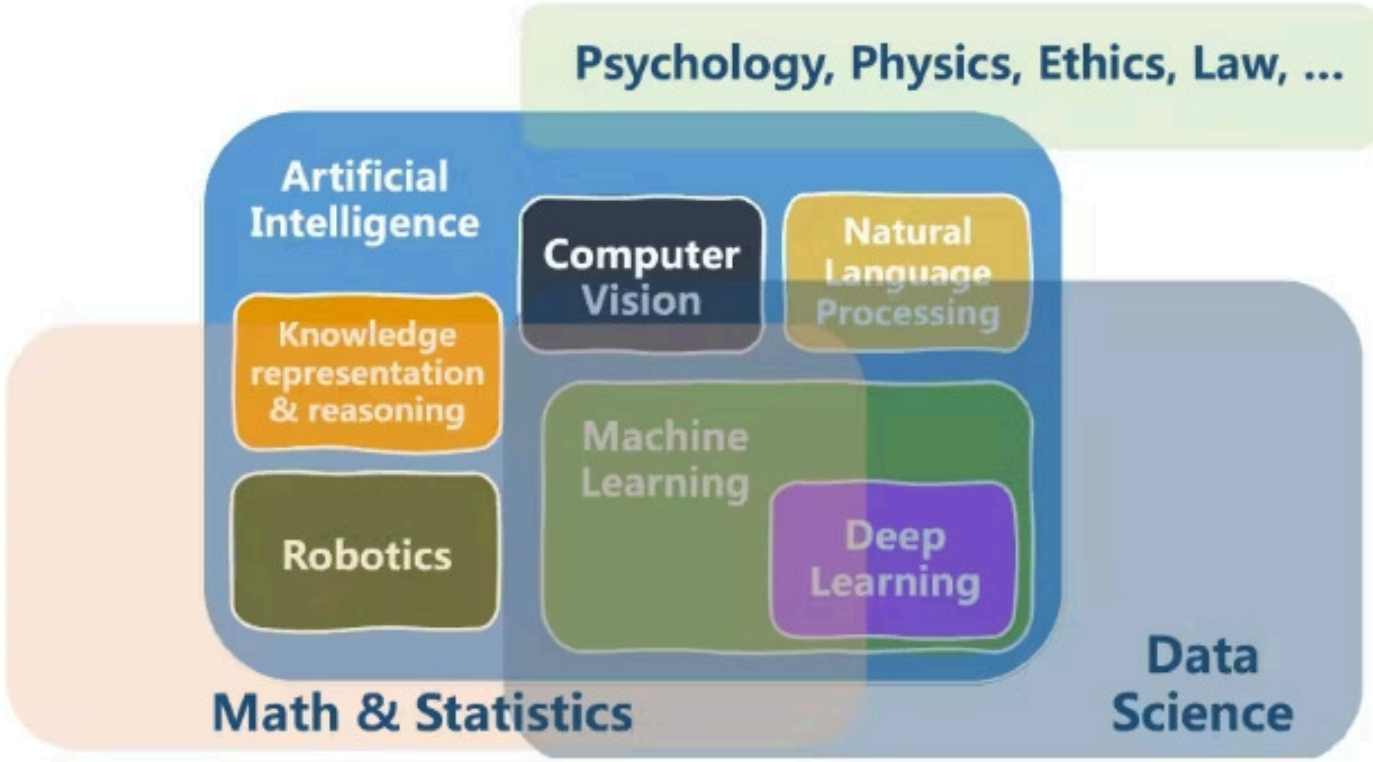
Data ...

Subdomains of Artificial Intelligence

- **Machine Learning**: Learn from data; predictions, inference
  - **Deep Learning**: neural networks; solve most challenging AI problems
- **Knowledge representation and reasoning:** reason, communicate with other AI systems
- **Robotics**: act and manipulate physical environment
- **Computer Vision**: visually perceiving objects in the environment
- **Natural Language Processing**: analyze, understand, communicate human language



Related disciplines



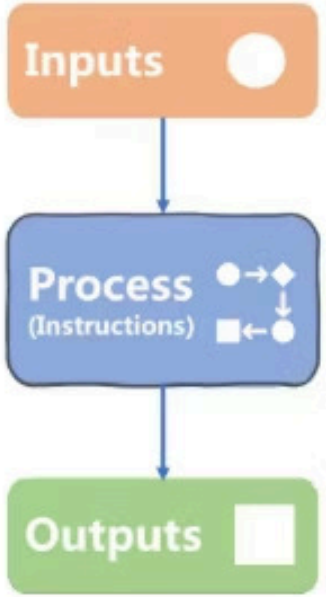
YouTube

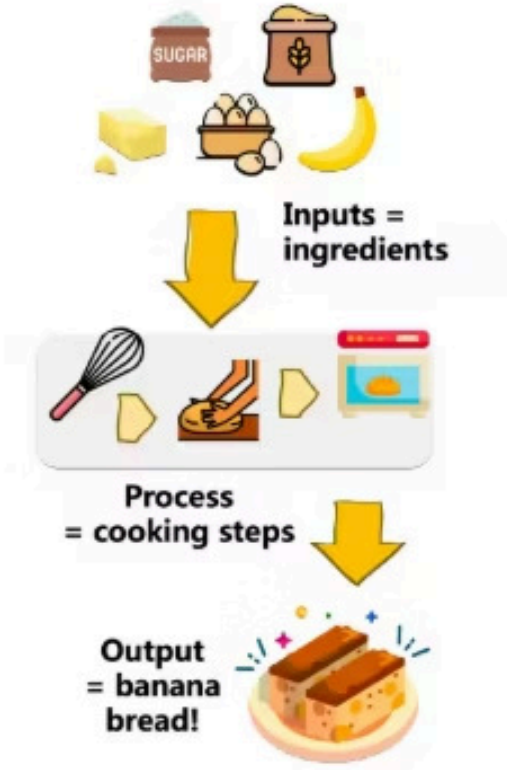
How to Spot Fake AI Photos | Hany Farid | TED

How do you know if that shocking photo in your feed is real, or just another AI fake? Digital forensics expert Hany Farid explains how he helps journalists, courts and...

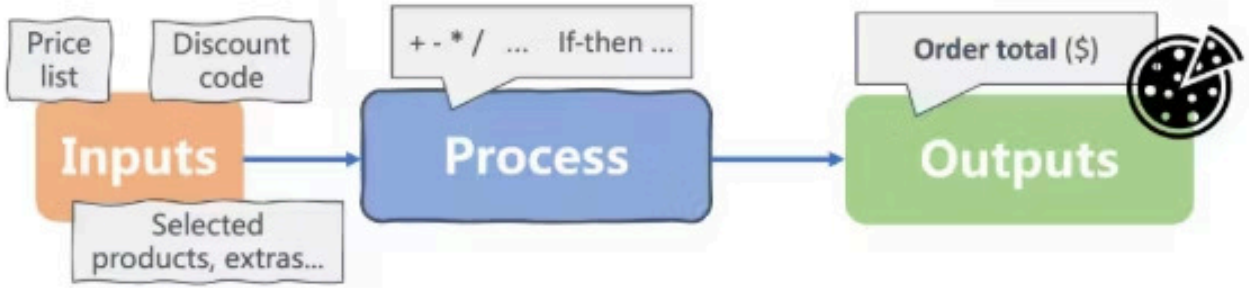
What is an algorithm?

> **Algorithm:** a set of (computer) instructions to solve a problem or perform an action.

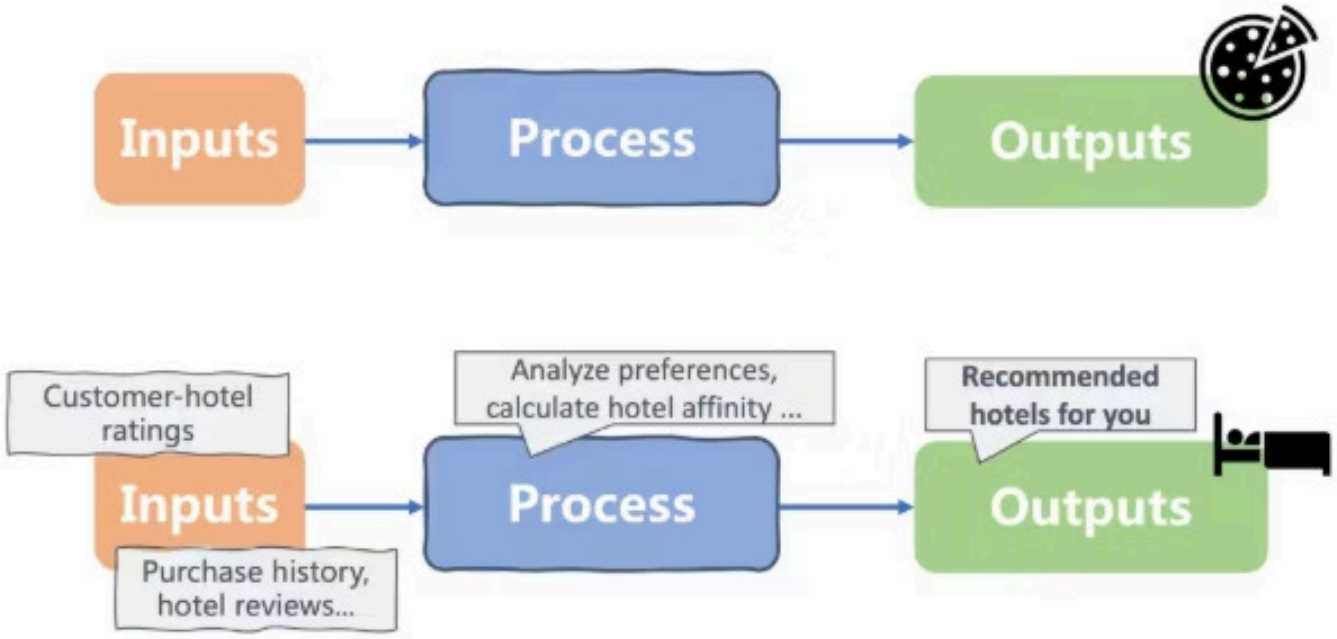




Algorithms in Computer Science vs AI algorithms



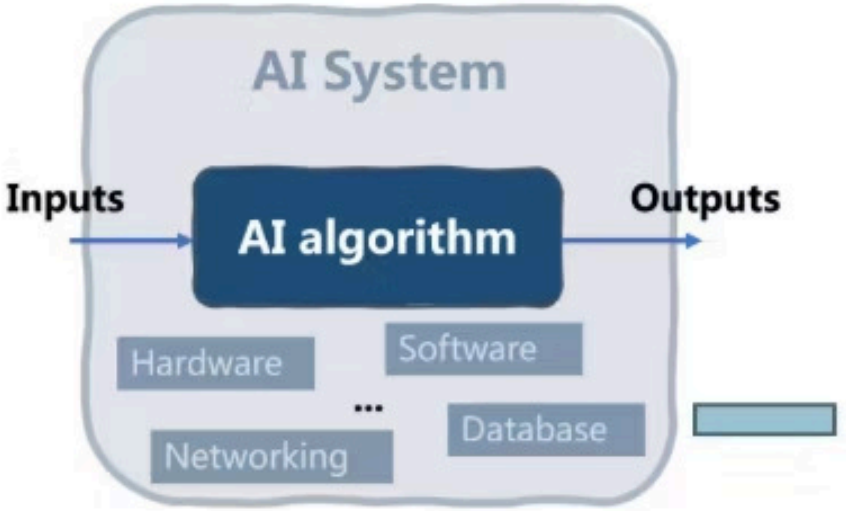
Algorithms in Computer Science vs AI algorithms



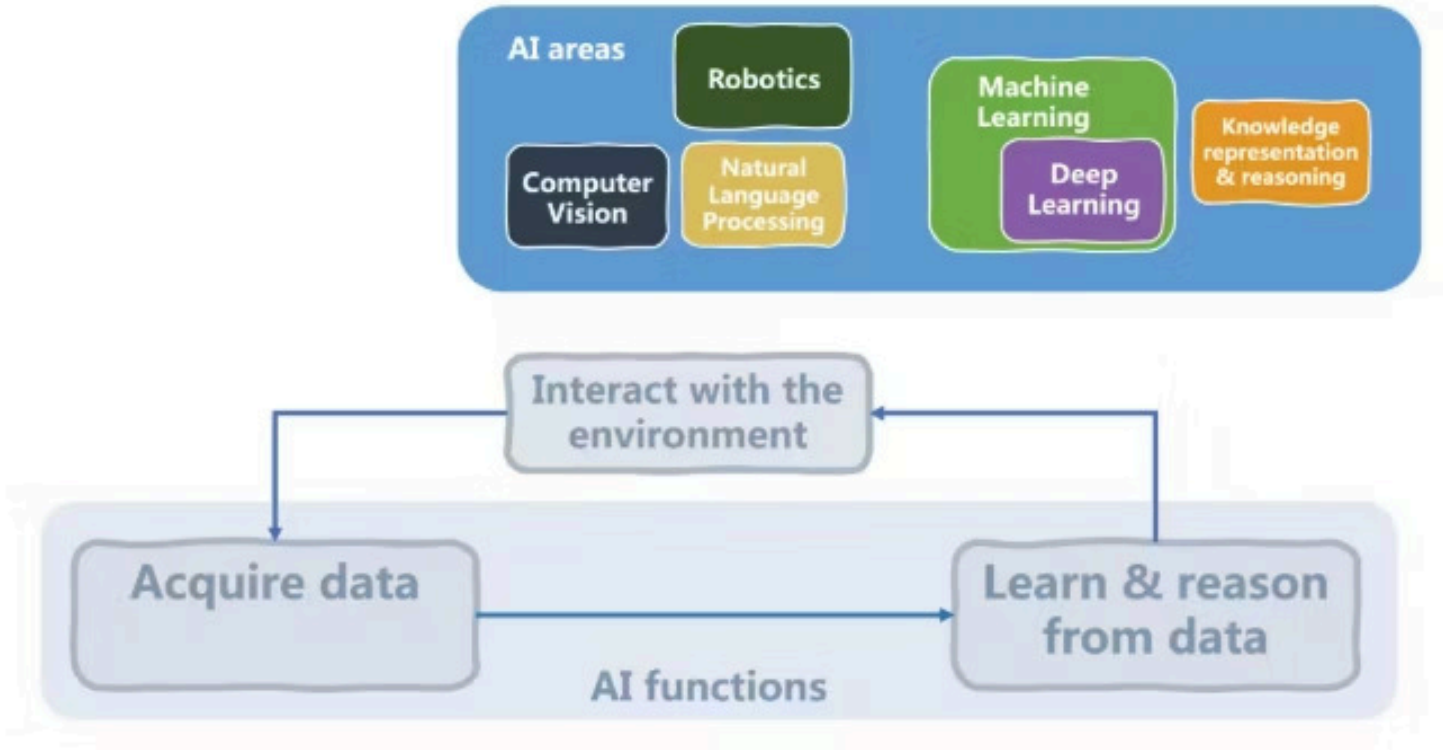
- **AI algorithms:** learn by themselves to produce better outputs or processes from input data

What is an AI system?

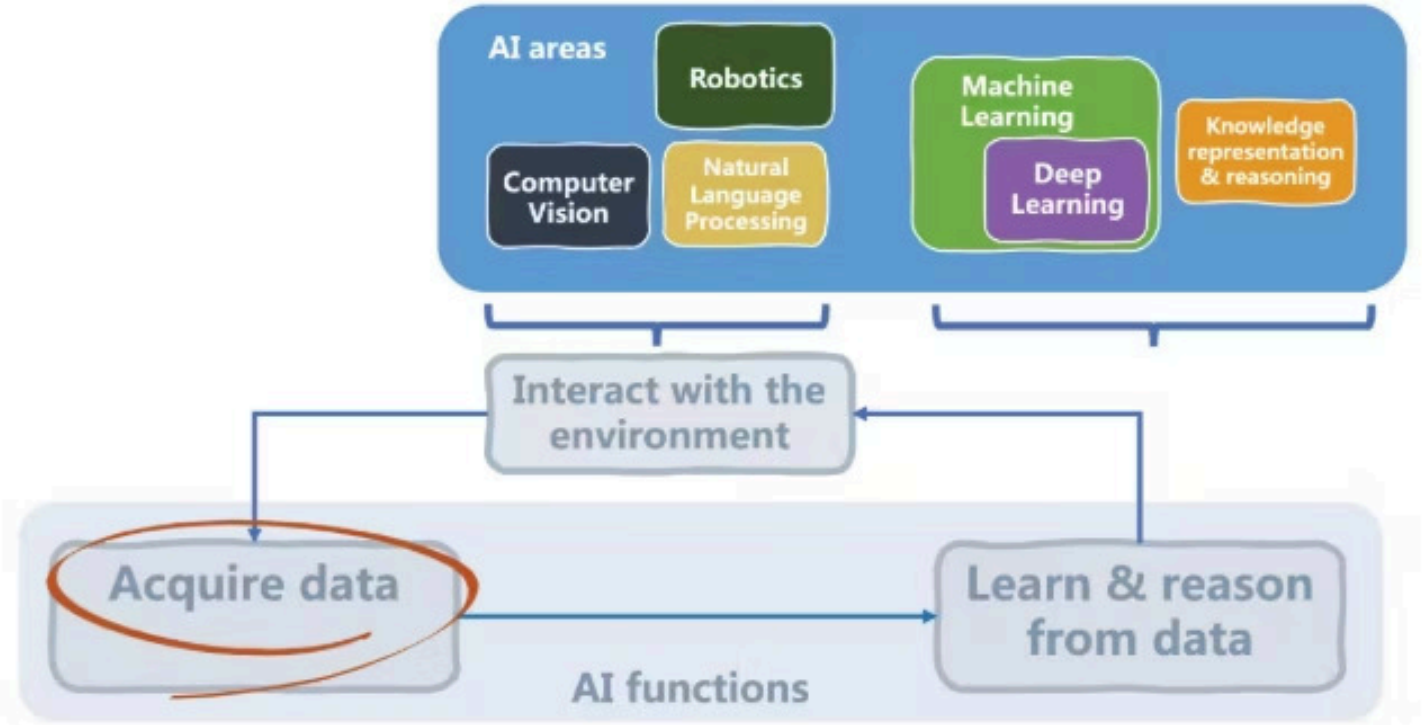
> **AI system:** infrastructure and components needed to implement and deploy AI algorithms in the real world



AI functions and areas involved



AI functions and areas involved



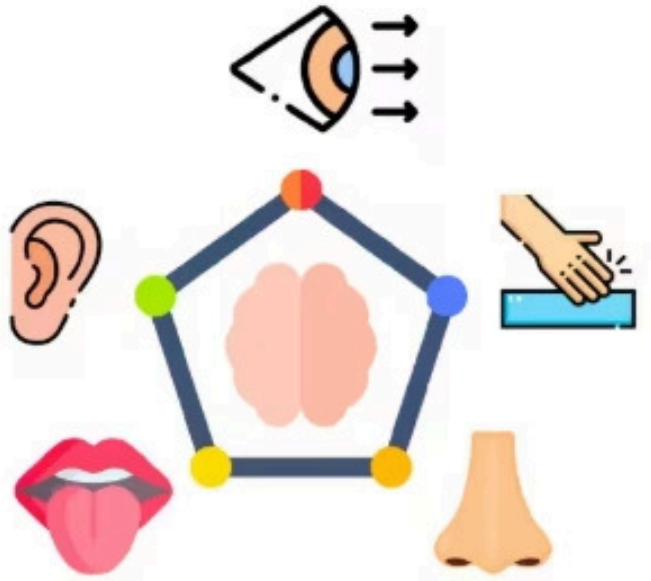
Data acquisition: sensing the environment

> Collect outside sensory information through **sensors**: mimic human senses

> Transform perceptions into **data**

Occurs in:

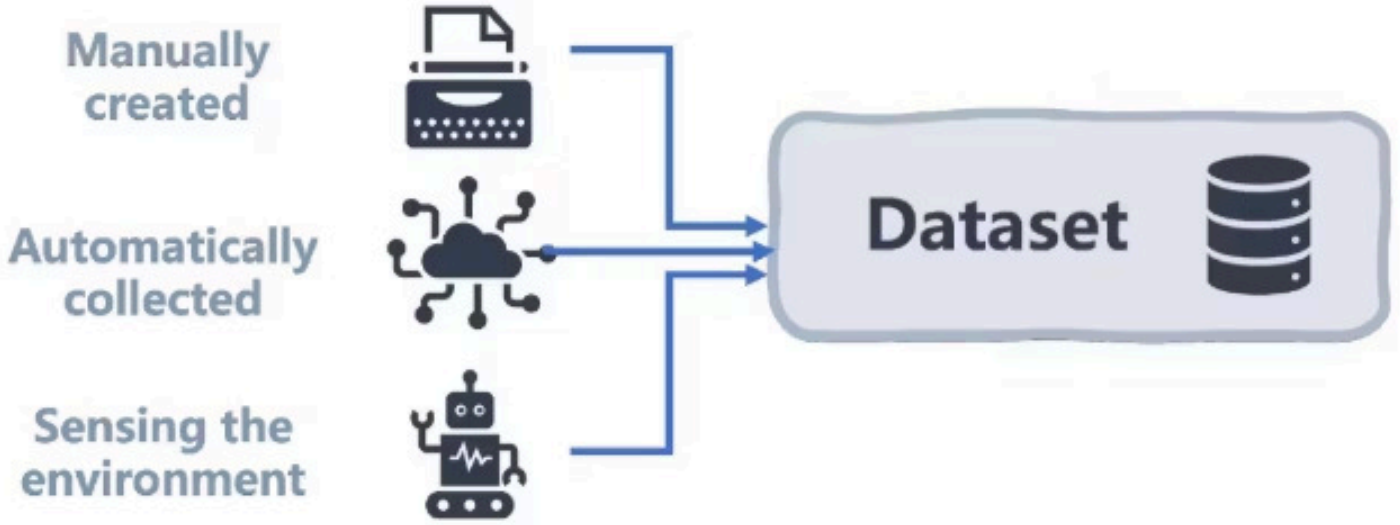
- **NLP and audio**: capturing speech, sounds.
- **Computer Vision**: satellite images, fingerprint, etc.
- **Robotics and sensors**: temperature, touch, motion, gravity, etc.



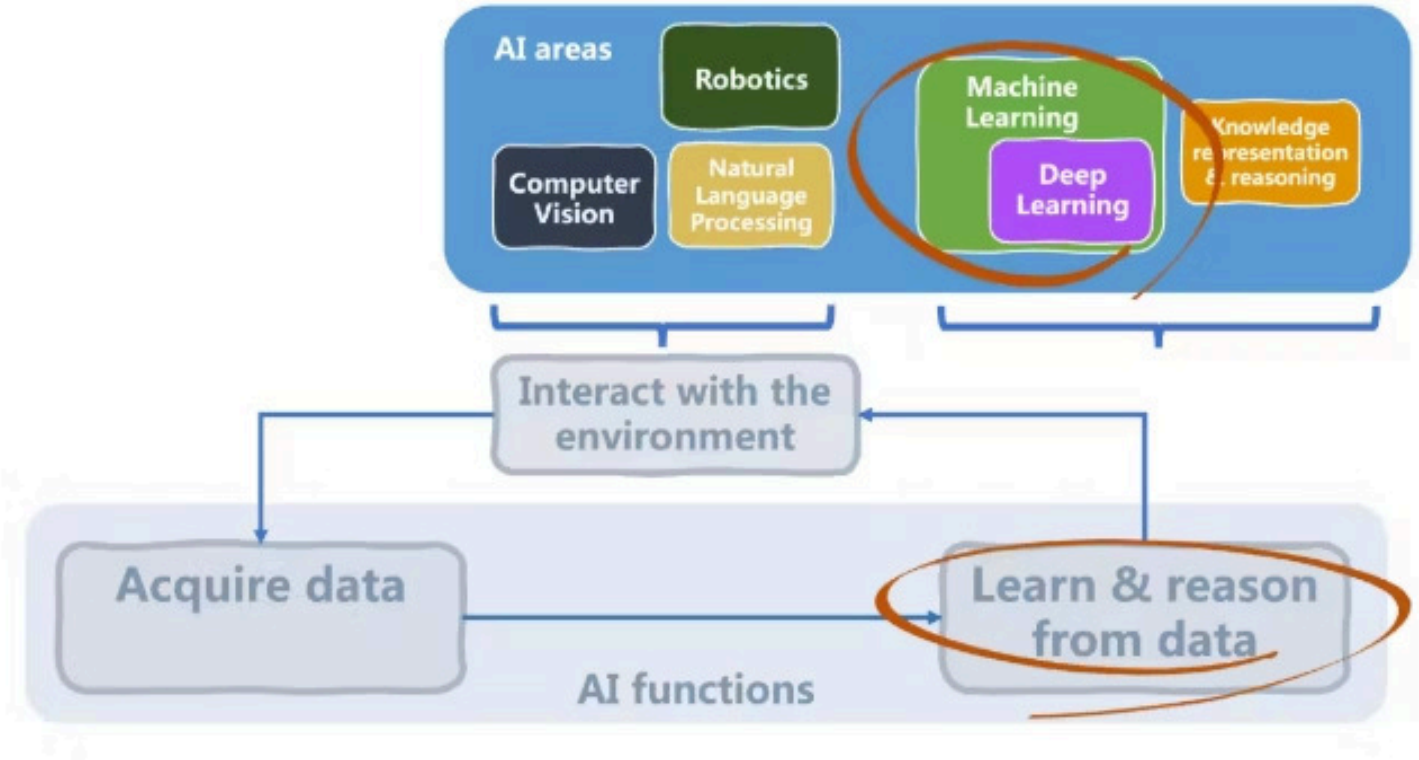
Data acquisition: datasets

> **Dataset** collection of data: data samples or instances of a given type of data

- **Structured:** tabular format, spreadsheets
- **Unstructured:** images, audio, videos, text, ...

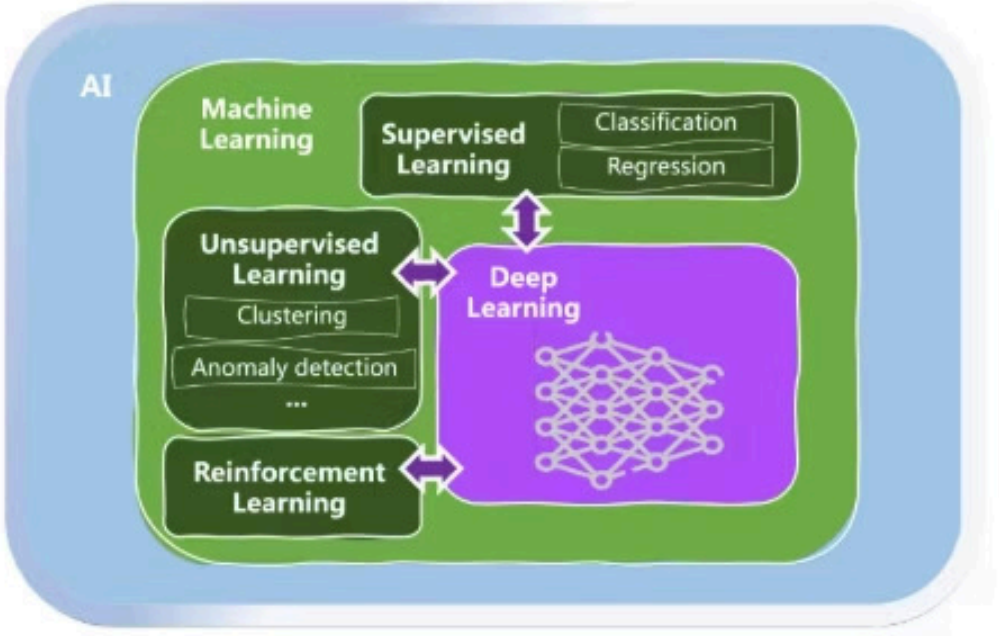


AI functions and areas involved



Enter Machine Learning (ML)

Machine Learning: learn from data and identify patterns to perform inference tasks: predictions, classifications, clustering, ...



Supervised Learning: classification

Classification: assign each data observation the category (*class*) it may belong to

- **Binary classification:** two classes, e.g. positive/negative, male/female, etc.

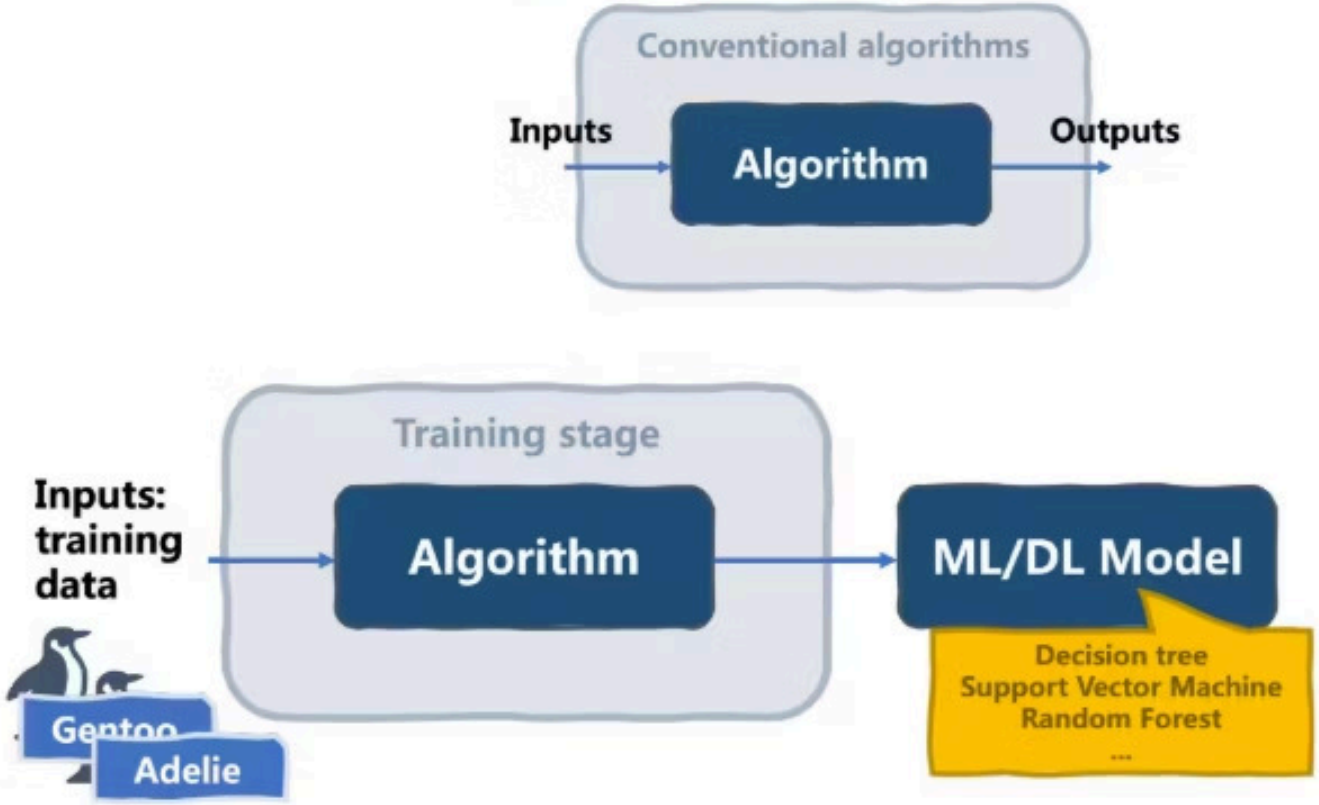
Supervised Learning: classification

Classification: assign each data observation the category (*class*) it may belong to

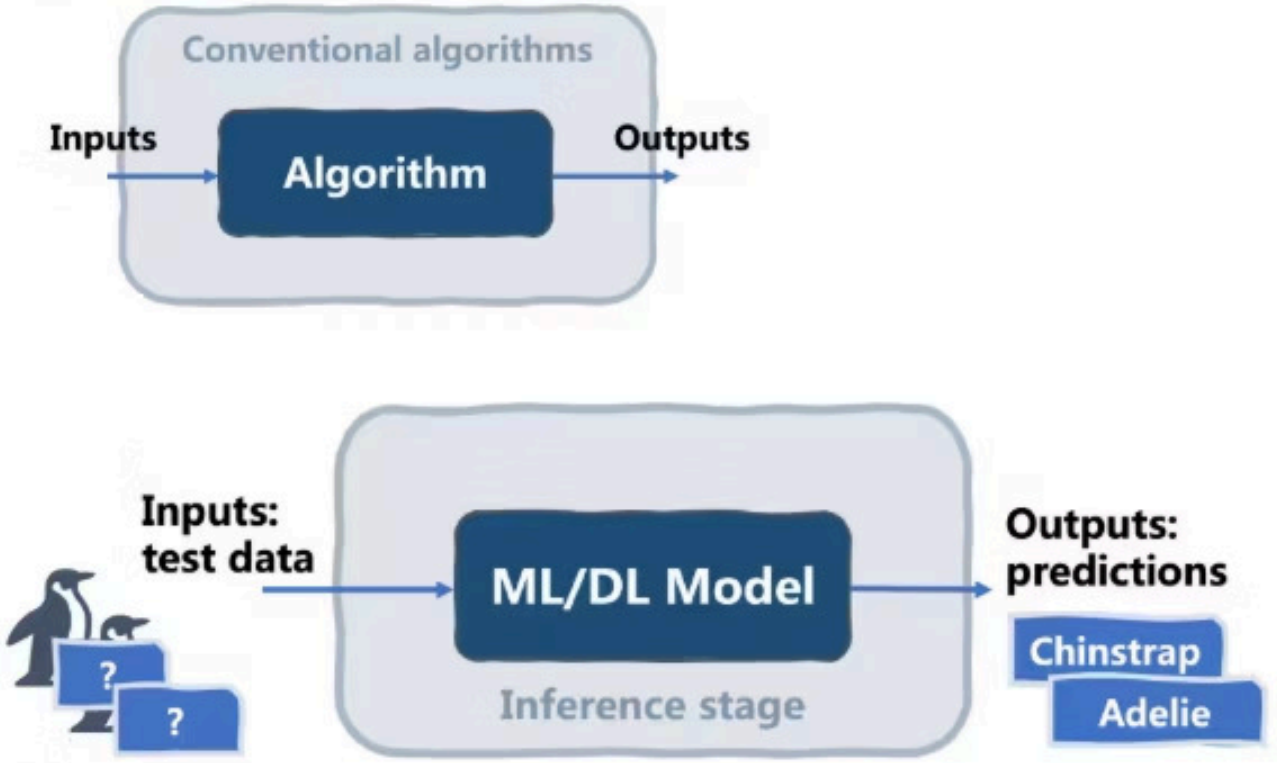
- **Binary classification:** two classes, e.g. positive/negative, male/female, etc.
- **Multi-class classification:** several mutually exclusive classes, e.g. multiple species

> **Supervised learning:** *Data annotation* (getting labelled observations with *known class a priori*) needed to learn/train a **model** capable of making inference

Machine Learning algorithm vs Model

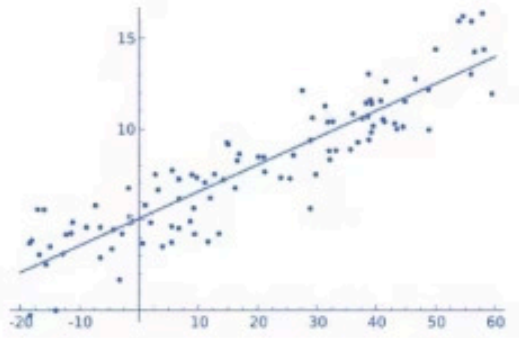


Machine Learning algorithm vs Model

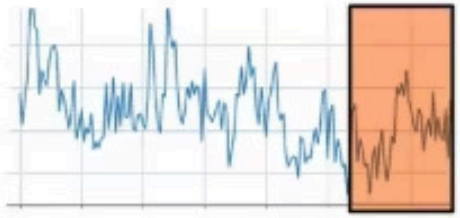


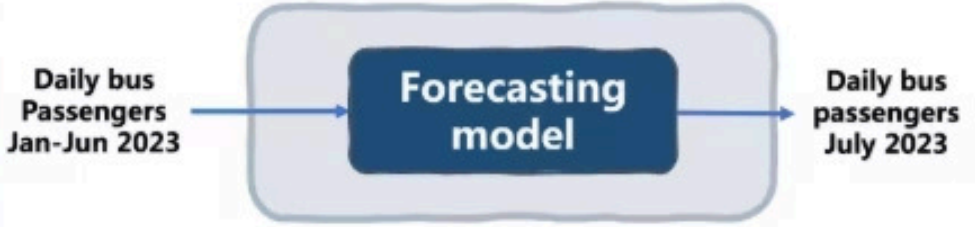
Supervised Learning: regression and forecasting

Regression: assign each data observation a numerical output or *label* based on its inputs



Time series forecasting: predict future values of variable, based on its past behavior





Supervised Machine Learning

Anomaly detection in fund disbursement is a critical application of supervised machine learning, allowing organizations to proactively identify and flag unusual transactions that deviate from established patterns.

Data Ingestion

Collect features like transaction amount, supplier, timing, budget item, and approving office for analysis.

Model Training

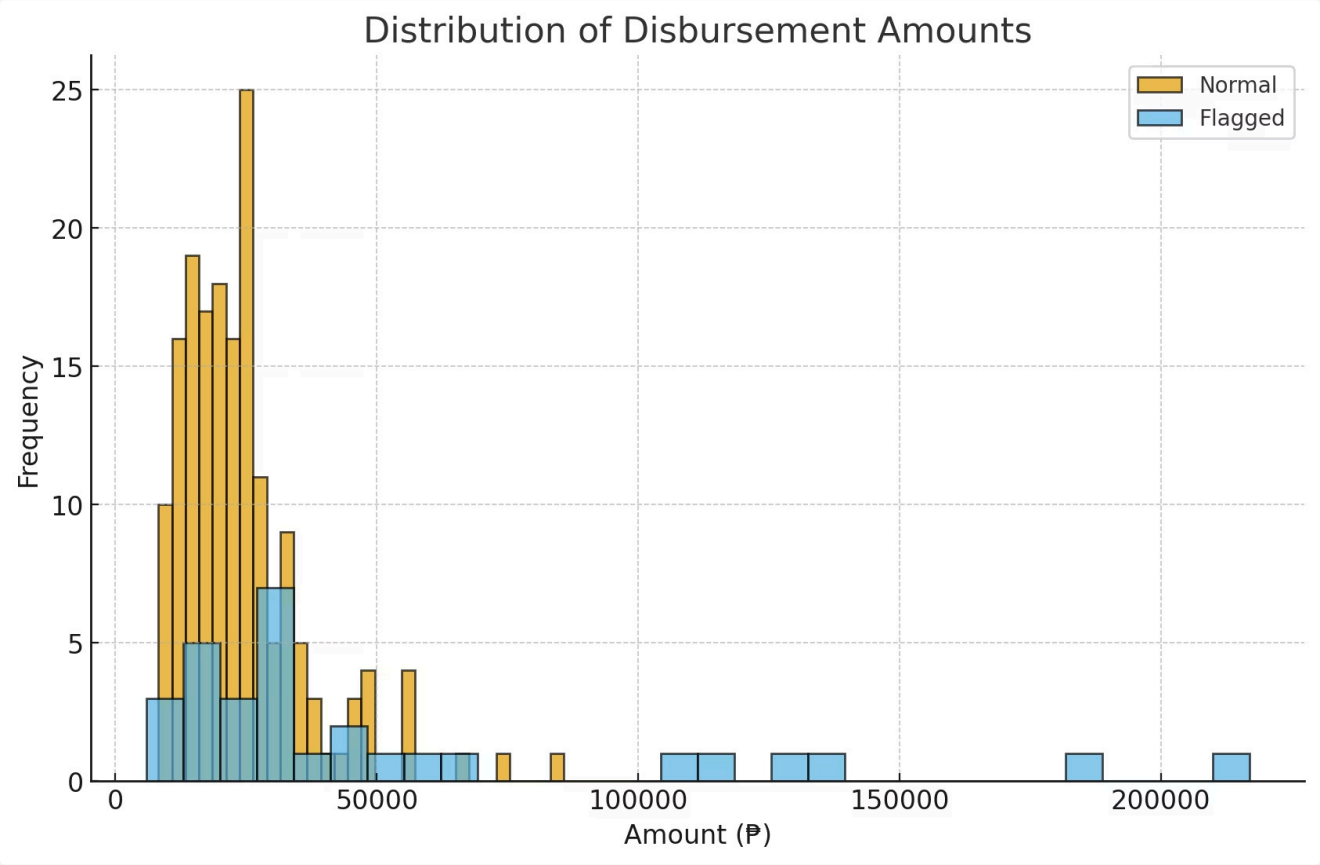
Train a binary classification model (e.g., logistic regression or XGBoost) using historical data with labeled 'normal' vs. 'flagged' outcomes.

Anomaly Flagging

The model highlights transactions that exhibit high risk for potential fraud, double disbursement, or errors before they become audit issues.

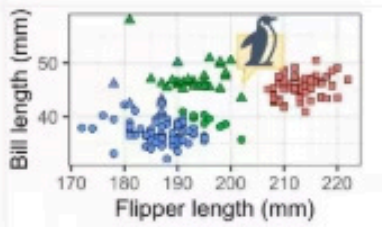
For example, a finance division can apply a model trained on historical COA audit flags to detect risk-prone transactions early, ensuring greater fiscal integrity.

Supervised Machine Learning

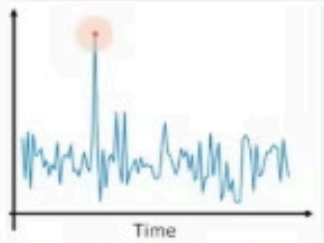


Unsupervised and reinforcement learning

Clustering: find subgroups of data with *similar* characteristics (e.g. *k-means* algorithm)

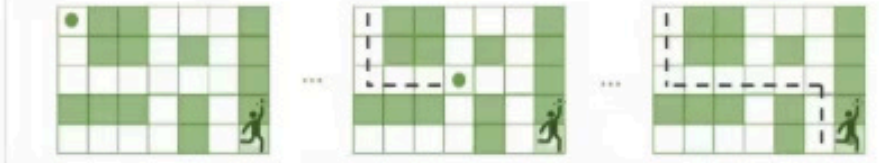


Anomaly detection: detecting *abnormal* data observations e.g. unusual card transactions

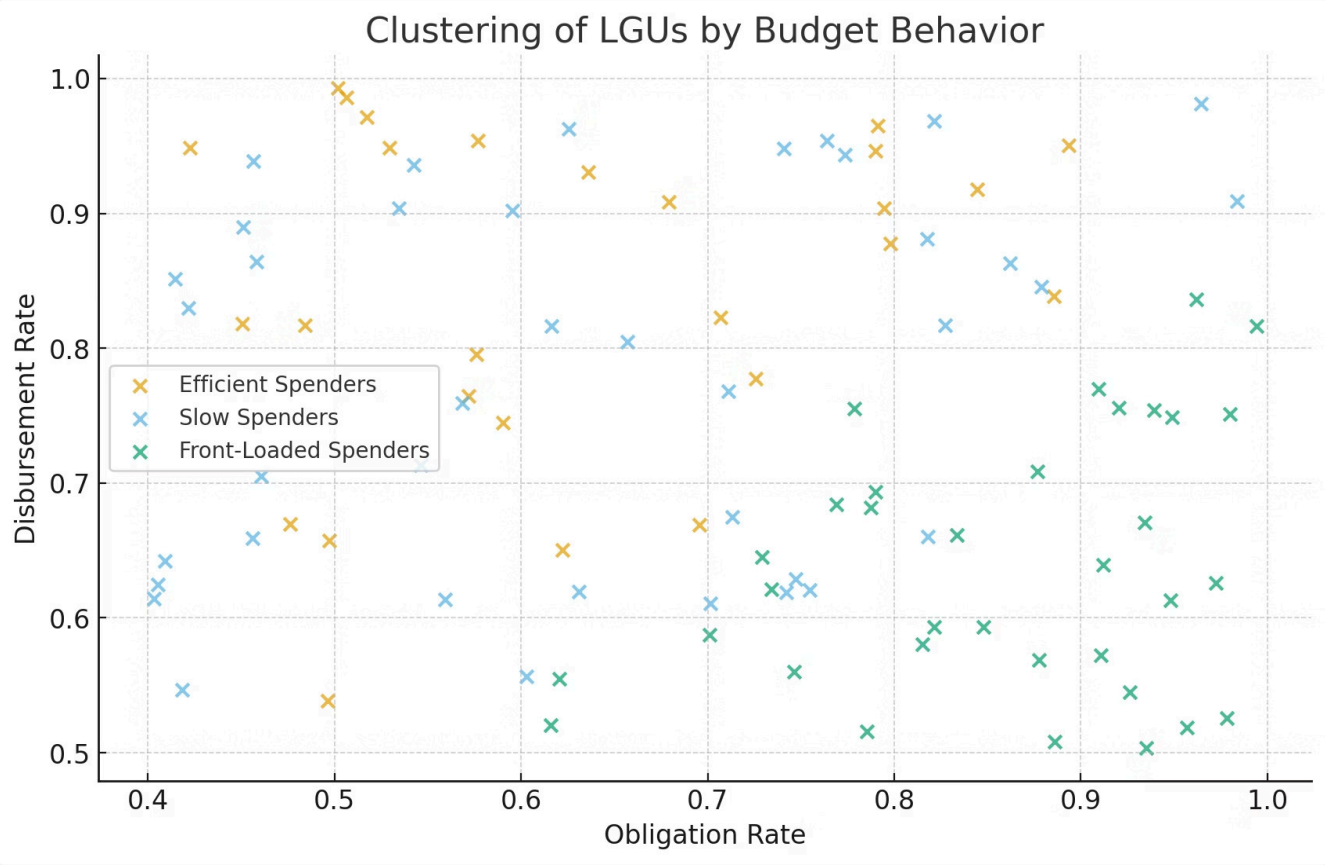


Association rule discovery: find common co-occurrences of items in transaction data

Reinforcement learning: learn by *experience* (trial and error) to master a complex task



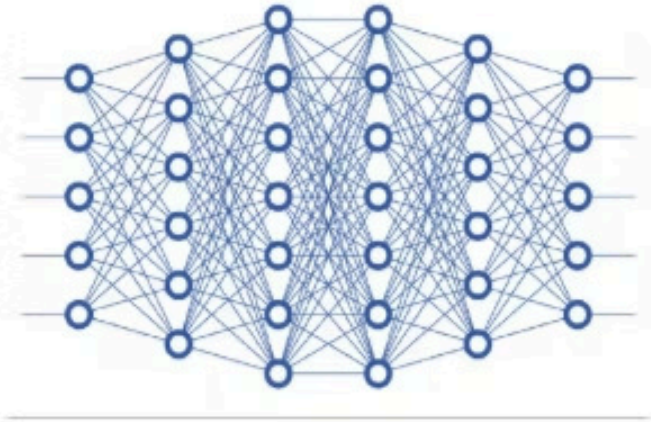
Unsupervised Machine Learning

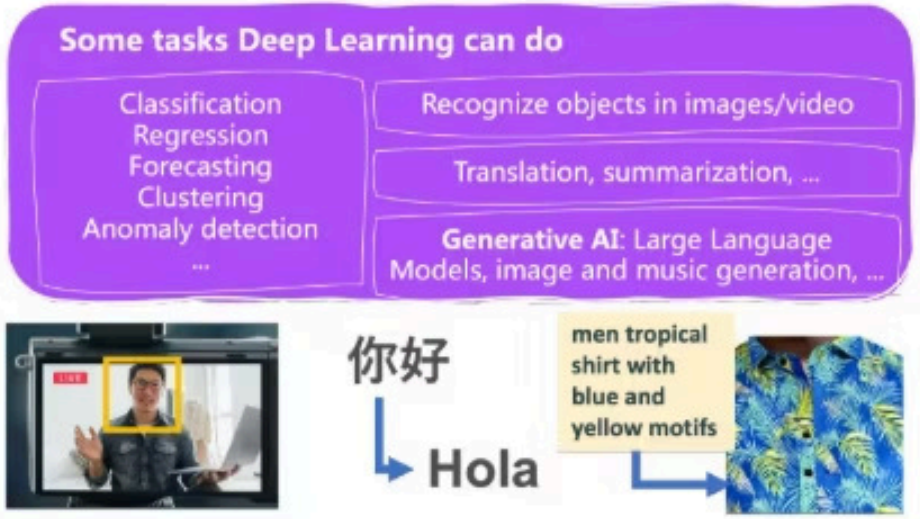


How about Deep Learning?

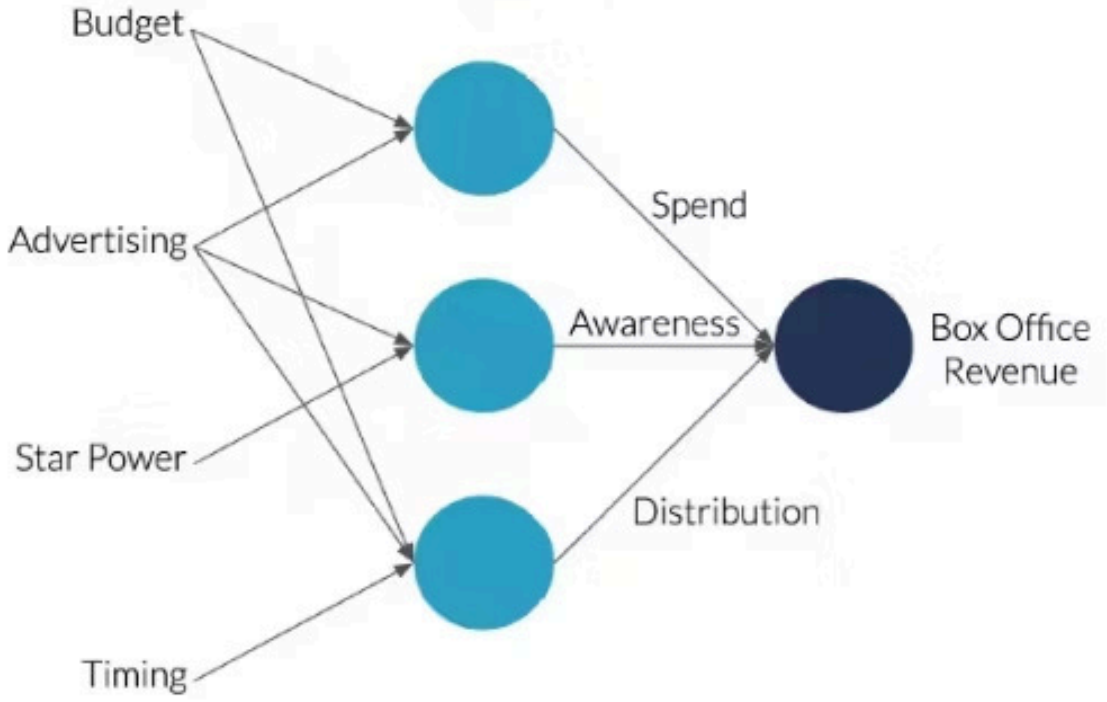
> Highly sophisticated models based on **deep neural networks:** solve very challenging tasks where classical ML models become limited.

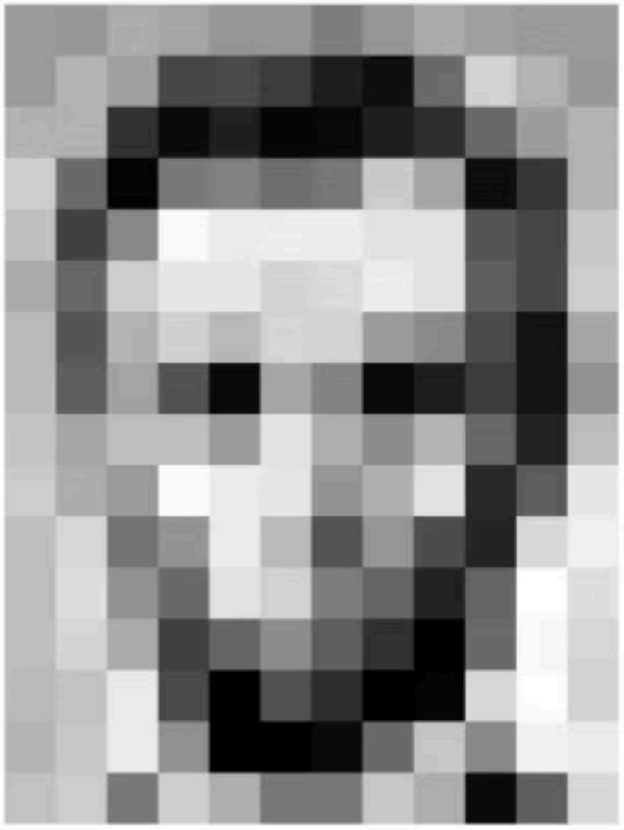
> **Need a lot of data** to learn: sometimes *millions* of observations.





Predicting box office revenue





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180	180	50	14	34	6	10	33	48	106	159	181
206	109	5	124	131	111	120	204	166	15	56	180
194	68	137	251	237	239	239	228	227	87	71	201
172	105	207	233	233	214	220	239	228	98	74	206
188	88	179	209	185	215	211	158	139	75	20	169
189	97	165	84	10	168	134	11	31	62	22	148
199	168	191	193	158	227	178	143	182	106	36	190
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190	224	147	108	227	210	127	102	36	101	255	224
190	214	173	66	103	143	96	50	2	109	249	215
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183	202	237	145	0	0	12	108	200	138	243	236
195	206	123	207	177	121	123	200	175	13	96	218

157	153	174	168	150	152	129	151	172	161	155	156
155	182	163	74	75	62	33	17	110	210	180	154
180	180	50	14	34	6	10	33	48	106	159	181
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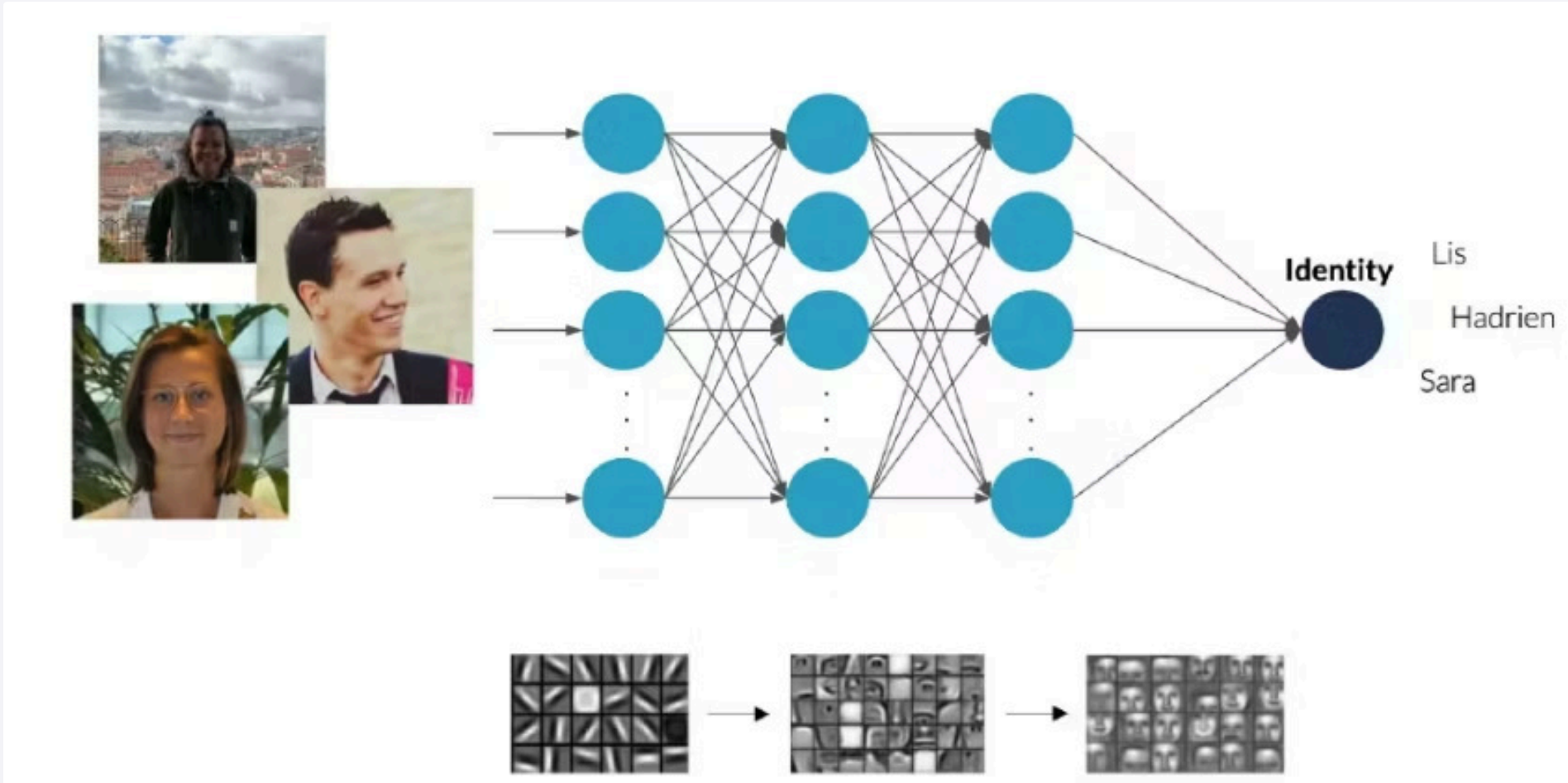
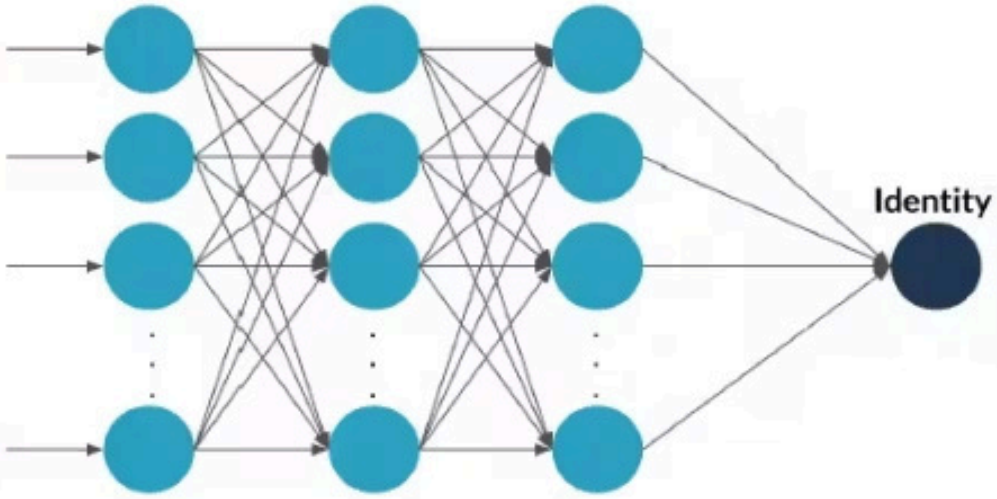
Deep Learning

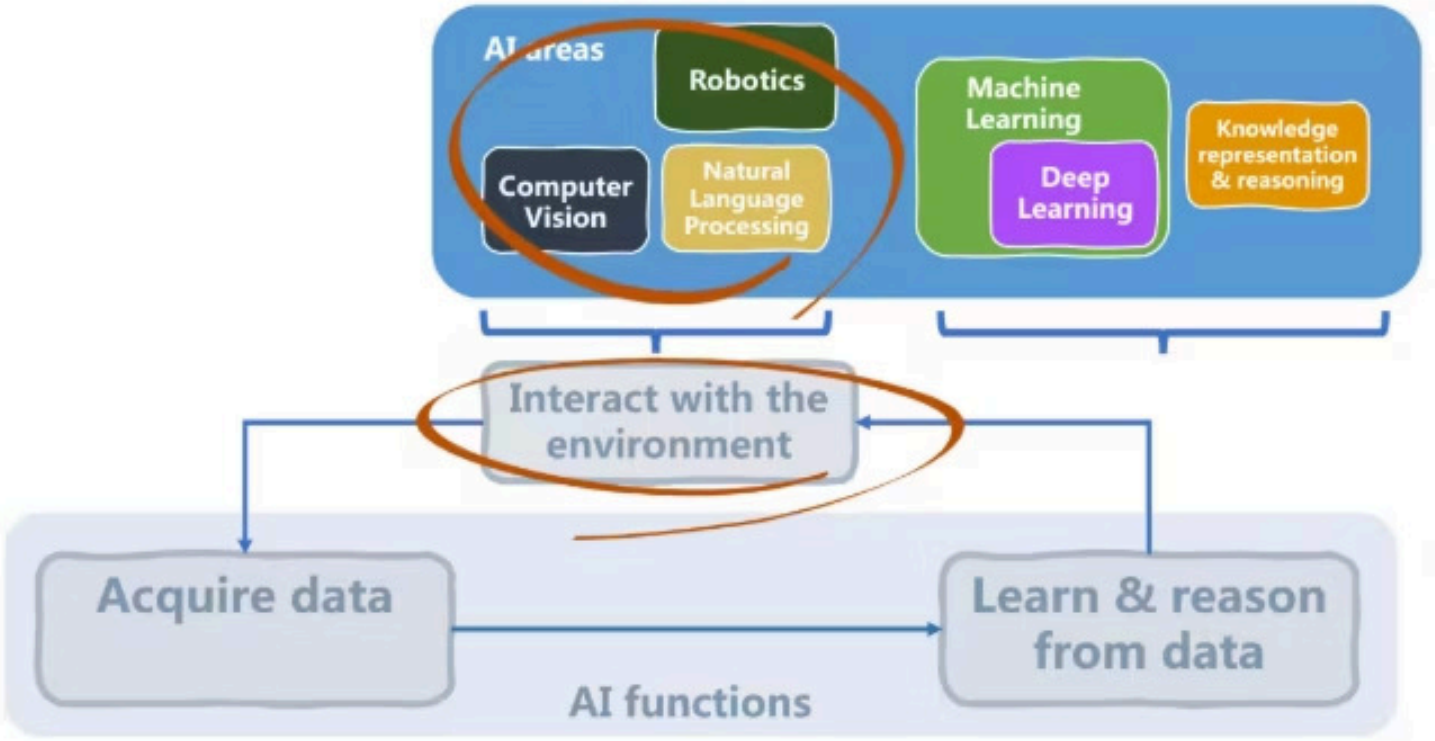


Face Recognition

Training the neural network



AI functions and areas involved



Computer Vision

- **Image processing:** intelligently enhance images and video
- **Object detection:** identify subjects in images/video for surveillance, logistics, etc.
- **Motion analysis:** extract motion information like speed and direction of objects
- **Image and video generation:** create realistic visual data from human text

YouTube

DeepX: Computer Vision Application In The Construction Industry

DeepX is an R&D-intensive and innovation-driven consortium that provides Artificial Intelligence-powered Computer Vision solutions for businesses. We help businesses...

Natural Language Processing (NLP)

- **Text-based**
  - **Text classification**
  - **Sentiment analysis:** extract positive and negative feelings in text, e.g. customer reviews.
  - **Question answering** (*chatbots*)
  - **Text summarization**
- **Speech-based**
  - Text-to-speech
  - Speech-to-text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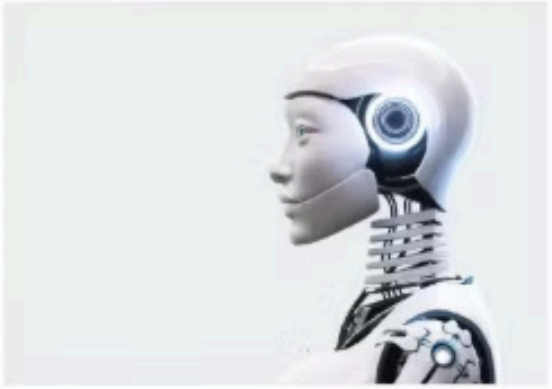
Robotics

- **Sensing and perception:** collecting data or perceiving signals
- **Mobility:** moving in the environment guided by perceptions of surroundings
- **Manipulation:** the robot modifies its environment
- **Human-robot interaction:** e.g. conversational robots endowed with NLP

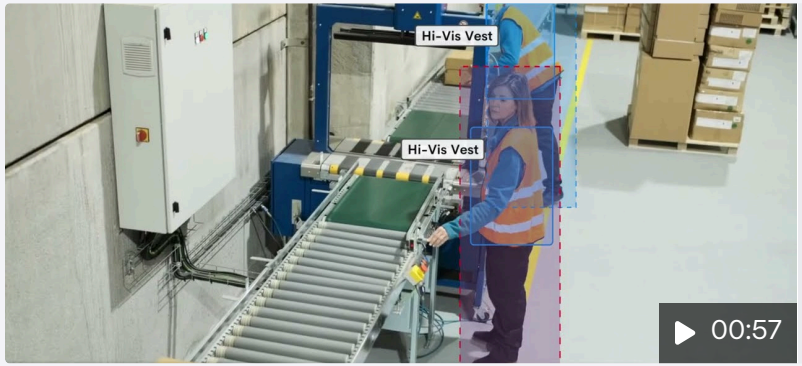




YouTube

Coffee Shop AI – Barista Tracking

Coffee shop uses AI to track the Productivity of Baristas and how much Time Customers are spending in the Shop. Guys, I found the source. Here it is:...



YouTube

How to improve workplace safety with AI Monitoring

Integrating with existing cameras, AI Monitoring provides insights into previously unseen activity that enables managers to proactively improve operations and...

AI Evolution in Public Financial Management

AI as Assistant

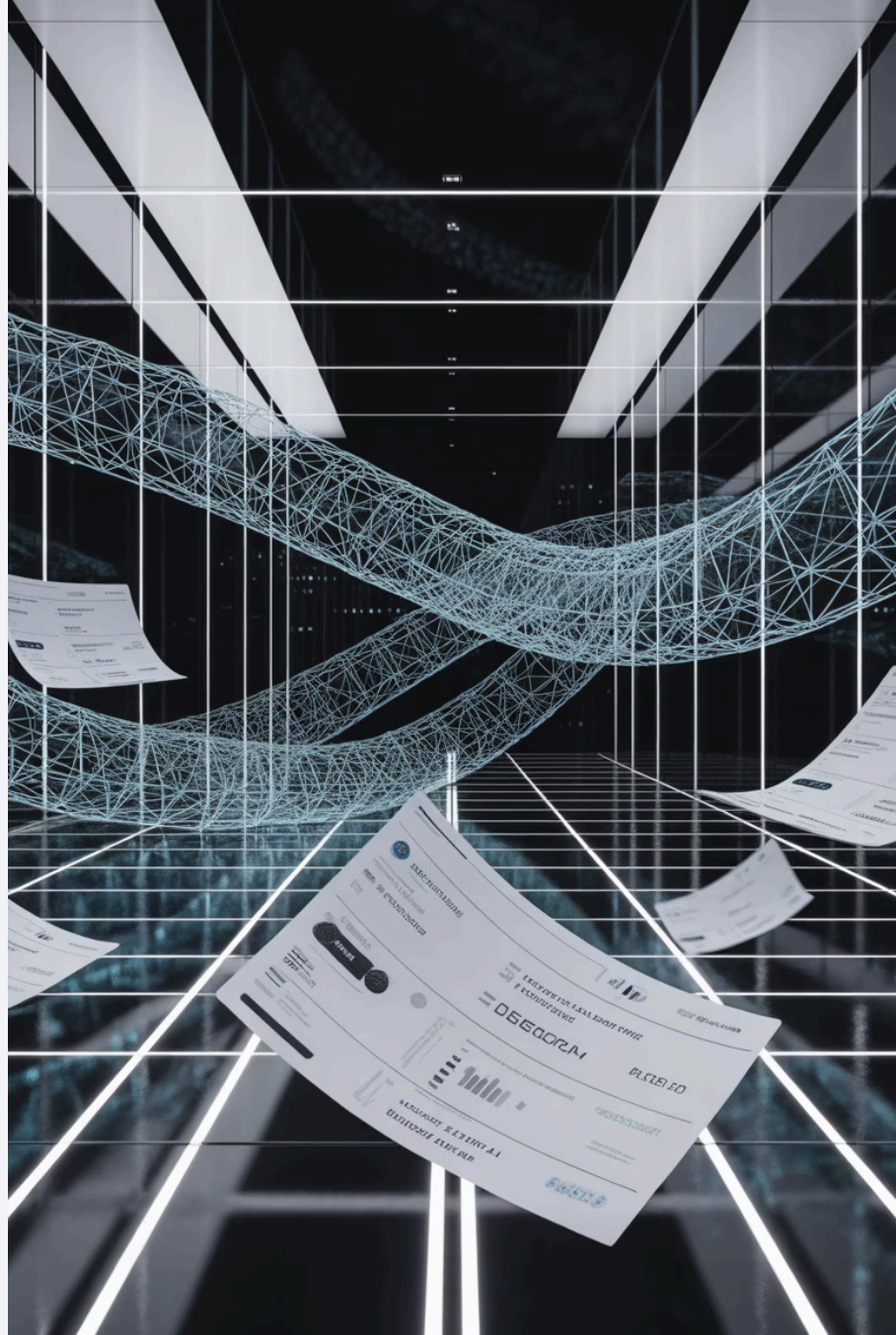
Automates high-speed, low-cost administrative tasks

- Documentation acceleration
- Data accuracy improvement
- Workflow digitization

AI as Advisor

Analyzes complex datasets for enhanced forecasting

- Decision support systems
- Predictive analytics
- Strategic insights



Budget Preparation and Forecasting

Predictive AI Power

ML and Deep Learning analyze historical data with superior accuracy

What-If Scenarios

Azure Data Analytics runs sophisticated simulations for policy costing

Proactive Planning

Adjust expenditure baselines based on robust future impact simulations

Financial Reporting and Oversight

NLP & GenAI Transform Reporting

Document classification

Invoice matching

Internal controls

Microsoft 365 Copilot condenses massive textual data into accurate, structured summaries instantly

Procurement and Audit Excellence

Document AI

OCR and NLP automate data capture from invoices, receipts, contracts

Contract Analysis

Google DocAI extracts key clauses, reducing legal review time

Anomaly Detection

ML models identify suspicious patterns, optimize auditor workload

AI Tool Mapping for Core PFM Functions

PFM Function	AI Tool Type	Tool Examples	Productivity Gain
Budget Preparation	Predictive AI / ML	Azure Data Analytics	Enhanced baseline costing accuracy
Financial Reporting	NLP / GenAI	MS 365 Copilot	Automated data extraction
Procurement	Document AI / OCR	Google DocAI	Automated invoice matching
Policy Analysis	GenAI (LLMs)	Grammarly/Copilot	Drafting policy memos
Audit & Compliance	ML / Anomaly Detection	Custom ML models	High-risk transaction identification

Practical AI Tools: Low-Hanging Fruit

Generative Writing

Grammarly (46.2% usage) and MS 365 Copilot (13.9%) for policy memos and presentations

Data Validation

AI agents verify transactions across systems, flag discrepancies in real-time

Meeting Transcription

GenAI tools auto-transcribe and summarize, saving 3 hours per worker weekly

Prompt Engineering Mastery

The CASINO Method for Strategic PFM Prompts

01

Context

Define role, agency, background

02

Audience

Specify reader's role and knowledge level

03

Scope

Set boundaries, data, constraints

04

Intent

Define output objective

05

Narrator

Specify style and tone

06

Outcome

Define format and length

The 4 C's for Policy Memos: Condition (what's happening), Criteria (what should happen), Cause (why it's happening), Effect (what might happen next)

Quantified Global Success Stories

1,000

Hours to 8 Hours

Brazil Treasury: ML classification reduced time by 99%, 97%+ accuracy

$375M

Recovered

US Treasury: AI-powered fraud detection in FY23

19,000

Vendors Flagged

US Defense: AI identified high-risk vendors from 43,000 analyzed

3

Hours Saved

Philippines: Potential weekly time savings per worker through AI

Fiscal Resilience Against External Shocks

From Reactive to Proactive

Advanced ML and deep learning maintain **R^2 of 0.993%** forecasting accuracy even during crises

- Scenario modeling with 'what-if' simulations
- Pre-determined reallocation pathways
- Real-time KPI tracking dashboards
- Informed budgeting framework

> "AI enables budgets to be inherently adaptable, sustaining critical services during turbulence"

Strengthening Accountability: Fraud Detection

The Threat

291% surge in synthetic identity fraud in Philippines (early 2025)

The Solution

Agentic AI with real-time risk scoring adapts to emerging fraud typologies

Applications

- Procurement anomaly detection
- Vendor risk assessment
- Document integrity verification

INQUIRER.net

AI is fueling a new wave of fraud–Is the Philippines ready?

If you have ever signed up for a digital service, you have probably gone through some kind of identity check.

Aligning Spending with Sustainable Growth

SDG Alignment

Precision resource allocation for sustainable development goals

Enhanced P/PE

AI accelerates program evaluation and evidence synthesis

Social Services

Precision beneficiary identification and rapid aid distribution

Ex-Ante Analysis

Predict policy impacts before implementation

AI-powered chatbots reduce bureaucratic hurdles, making social assistance more accessible and inclusive

Ethical and Data Privacy Frameworks

DPA Compliance is Paramount

1

Privacy Impact Assessments

Mandatory PIAs for all AI systems processing sensitive PFM data before deployment

2

Data Subject Rights

Uphold rights to object, rectify, or erase personal data in AI lifecycle

3

Security Architecture

Robust systems preventing data leakage and privacy breaches

4

Data Minimization

Use only strictly necessary and relevant data for defined PFM functions

Legal Foundation: Data Privacy Act of 2012 (RA 10173) applies to all AI phases—training, testing, deployment

The Human Factor: Workforce Augmentation

Core Competencies Required

1. **AI Literacy:** Understand capabilities and limitations
2. **Prompt Engineering:** Master CASINO framework
3. **Model Interpretability:** Analyze ML outputs, identify biases

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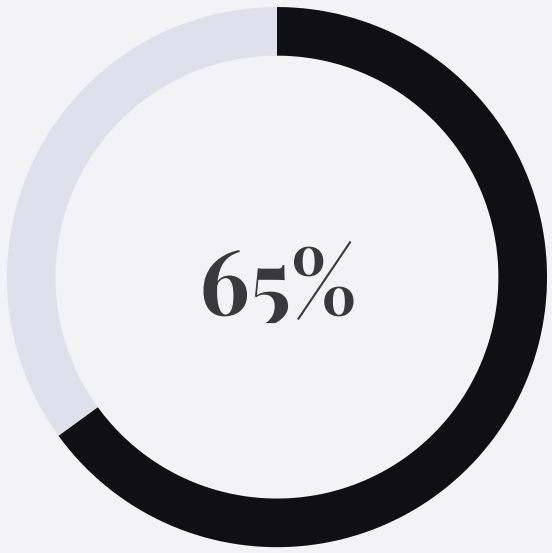
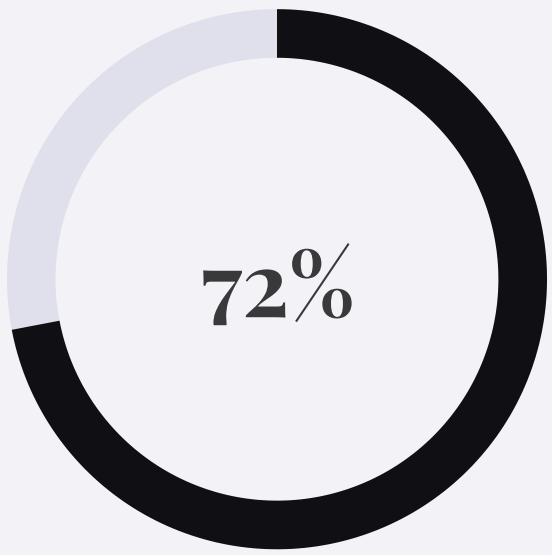
Training Resources

DICT free MOOCs, Coursera partnerships, specialized local providers

Addressing Workforce Anxiety



Employees anxious about job replacement



Fear negative salary impacts

Solution: Frame AI as augmentation tool, not replacement. Focus on strategic reallocation to higher-value work

Actionable Recommendations

Deploy Pilot Projects

Immediate rollout of Copilot, Grammarly, NLP tools for 10-20% time savings

Adopt Predictive Analytics

Invest in ML forecasting with 'what-if' scenario modeling for budget design

Institutionalize Governance

Establish AI Oversight Committee, mandate PIAs, ensure DPA compliance

Prioritize Transparency

Reject black-box models, implement XAI with human-in-the-loop oversight

Launch Augmentation Strategy

Integrate AI literacy into civil service standards, reinvest gains into strategic roles

> "AI offers unprecedented opportunity for efficiency, resilience, and inclusive growth aligned with national policy objectives"

Implementing AI Solutions in Your Organization

Approaches to integrate AI capabilities, ranging from individual empowerment to strategic in-house development.

Individual Adoption

Empower employees to leverage AI tools for personal productivity gains and efficiency.

API Integration

Build custom AI-powered features by connecting to existing AI services and platforms.

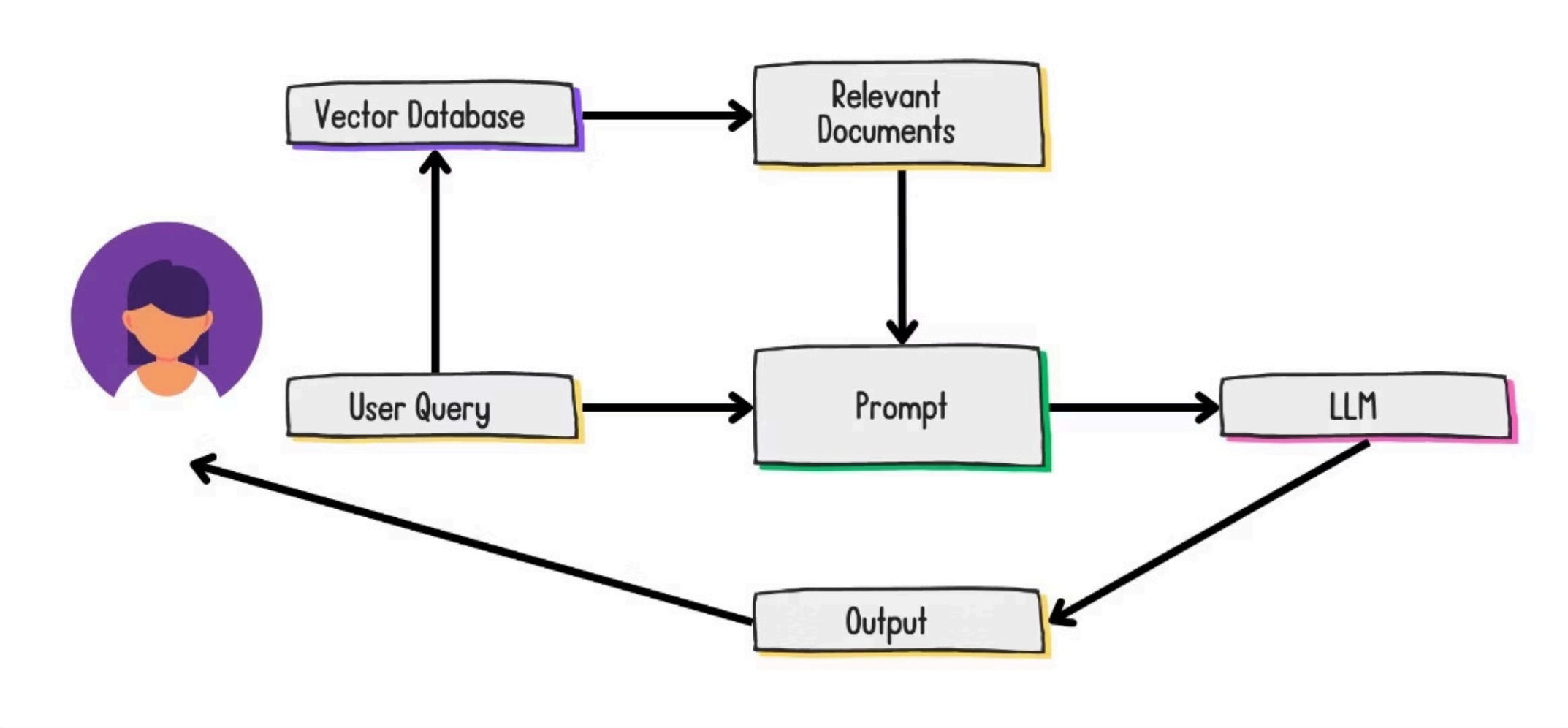
Off-the-Shelf Procurement

Acquire commercial AI applications tailored for specific business needs and quick deployment.

In-house Development

Invest in R&D to create proprietary AI solutions and models aligned with unique organizational goals.

Retrieval Augmented Generation



What are AI Agents?

AI Agents are autonomous systems designed to perceive their environment, make decisions, and act to achieve specific goals, often adapting their behavior over time. They represent a significant leap beyond traditional AI tools.

Perception

Continuously gathers and interprets data from their operating environment.

Reasoning & Planning

Utilizes internal models and logic to plan actions and make informed decisions.

Action Execution

Carries out tasks directly or through other systems to achieve defined objectives.

Autonomy & Learning

Operates independently and improves performance through accumulated experience.

AI Tools for Work: ChatGPT vs. NotebookLM

Choosing the right AI tool depends on your specific task. Let's compare two popular options for enhancing productivity:

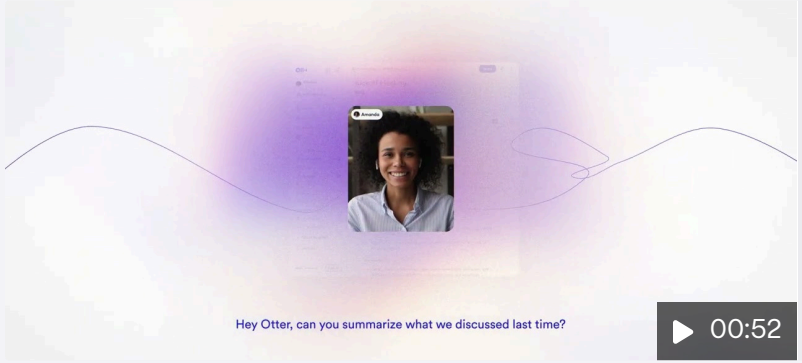
ChatGPT

- **General Purpose:** Utilizes a vast, broad knowledge base, excelling in creative content generation, brainstorming, and code assistance.
- **Conversational Interface:** Ideal for interactive dialogues, asking open-ended questions, and generating diverse text formats on various topics.
- **Versatile Applications:** Useful for initial drafts, summarizing public information, exploring new ideas, and general queries.

NotebookLM

- **Source-Grounded:** Exclusively uses user-uploaded documents (e.g., PDFs, Google Docs, web pages) as its knowledge base.
- **Research Assistant:** Optimized for summarizing, analyzing, and generating insights directly from your specific, private data.
- **Contextual & Factual:** Reduces hallucinations by referencing only the provided sources, making it excellent for fact-checking and deep dives into specific materials.

Otter AI



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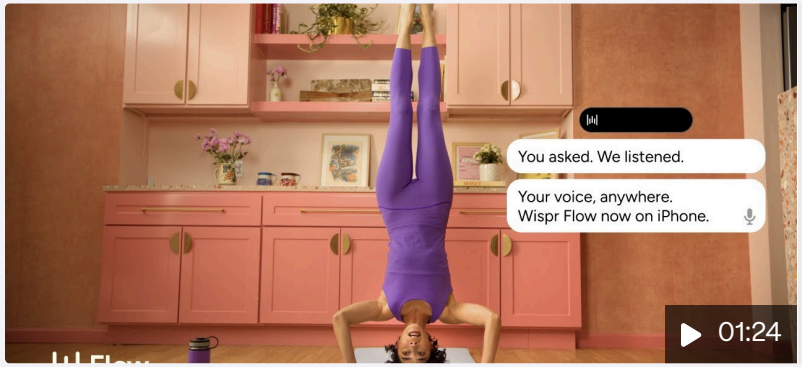
Otter Meeting Agent: Your New Voice-Activated Teammate

Otter Meeting Agent is a voice-activated AI meeting agent that can actively participate in meetings, responding to queries based on the organization's...

Wispr Flow



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Wispr Flow for iPhone

Talk naturally. Flow writes perfectly. 🚀 Wispr Flow is the #1 Product of the Day & Week on Product Hunt—now on iPhone. □ Download FREE on the App Store:...

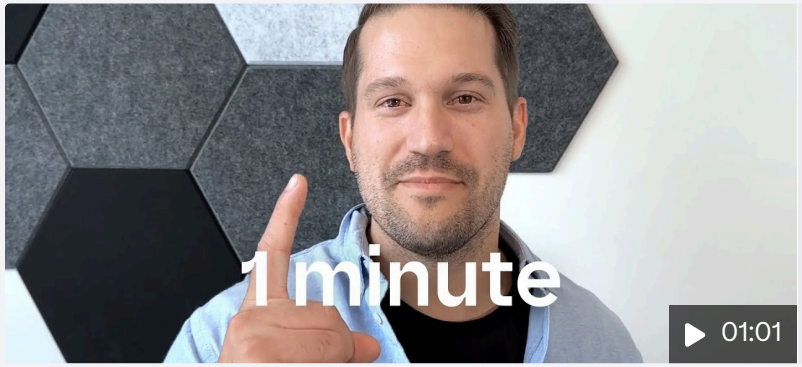
Notion AI

YouTube

Introducing the new Notion AI

Meet the new Notion AI—the helpful assistant you didn't know you need. Now, Notion AI is able to search Notion, Slack, and Google Drive, generate and edit content,...

Lumen5



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Create a Video in 60 Seconds Using Lumen5 (AI-Powered Quick Start)

Pressed for time? Watch how easy it is to make a complete video in under a minute with Lumen5. Leveraging AI-powered storyboarding, rich media suggestions, and...

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Thank you for the privilege of your time