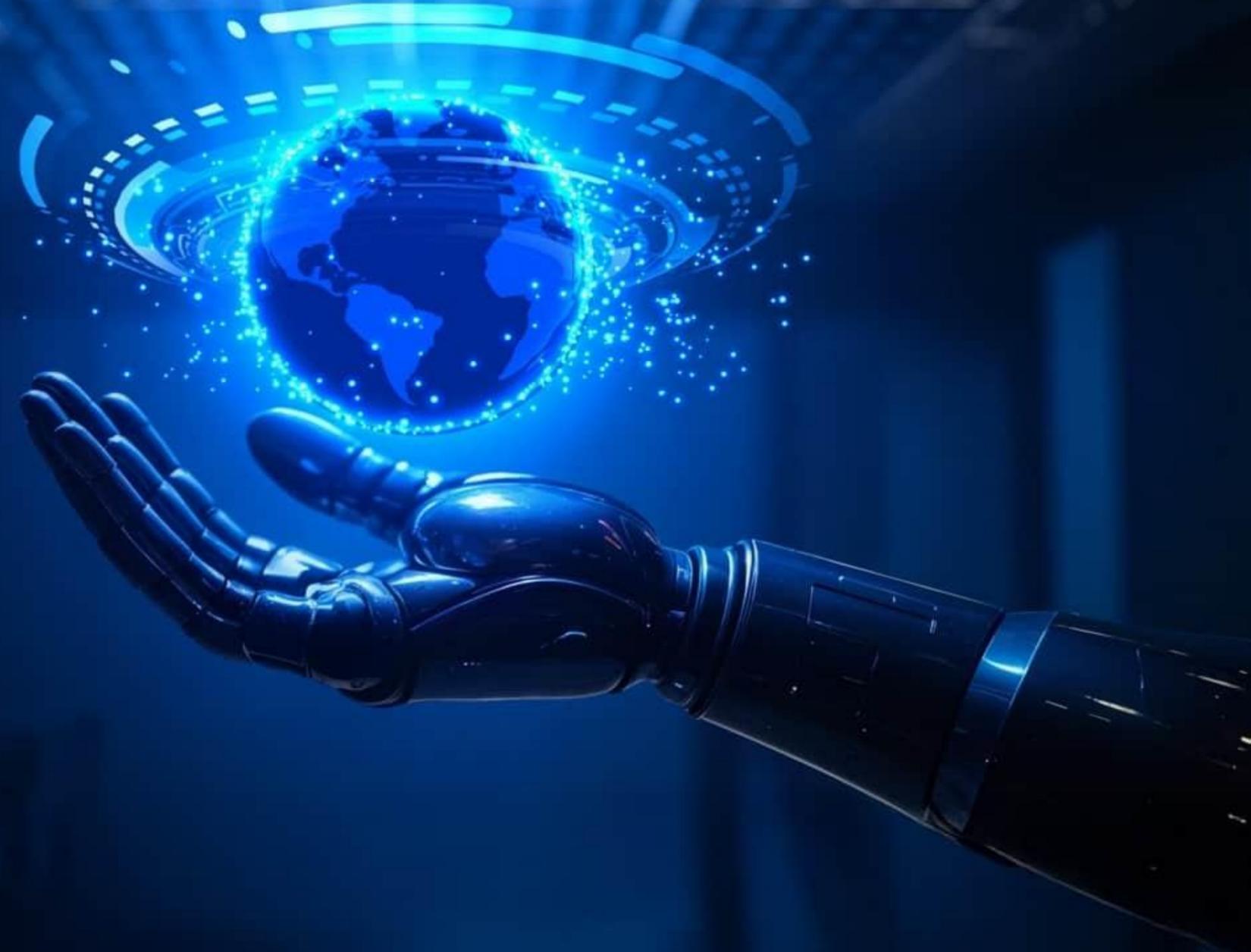




Will AI Eat Geo?



Idays, Bad Nauheim, Germany

Peter Rabley

09.12.2025

We created maps to simplify our understanding of the world

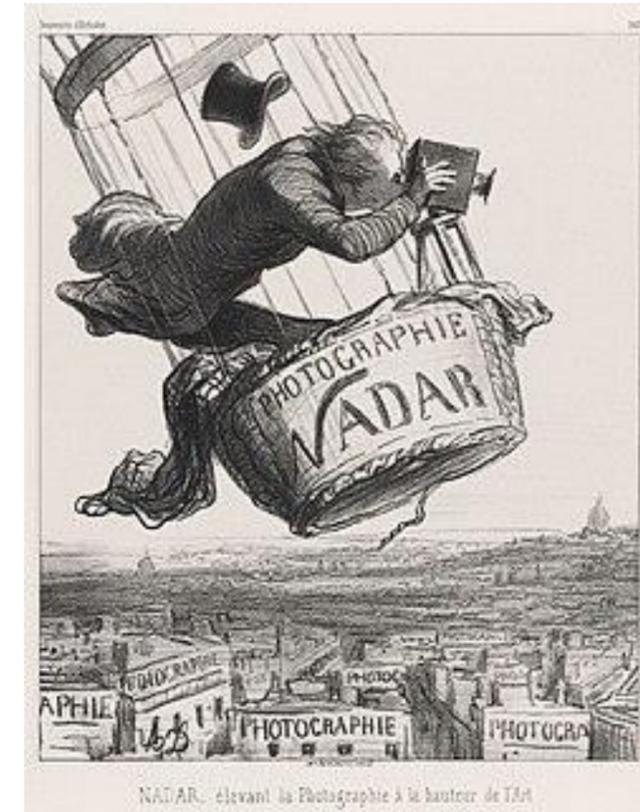
World Mercator projection with true country size and shape added



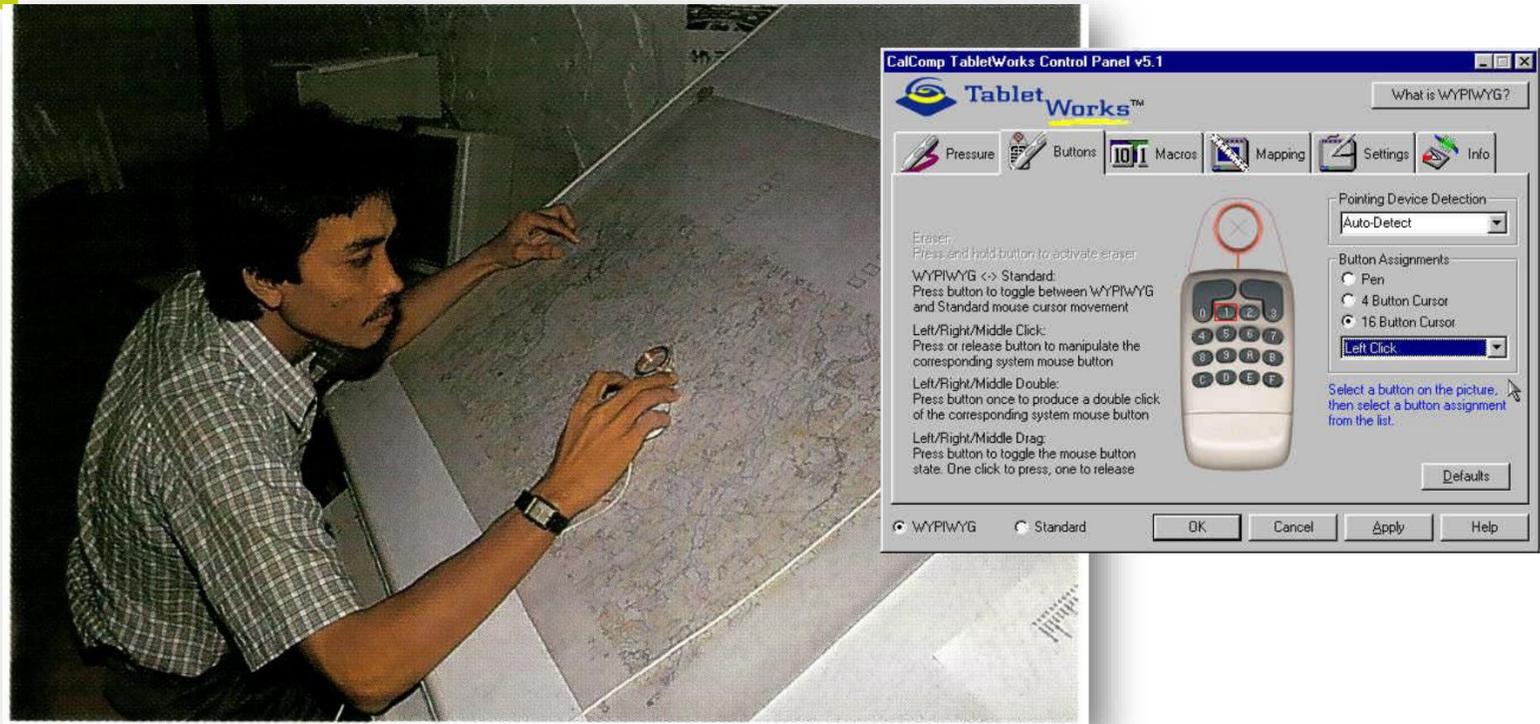
Nippur map tablet, Iraq (c.1500 BC)



@neilrkaye



Then we digitized them for efficiency (or so we thought)



Jakarta, JABOTABEK Land Use Mapping (1992)

INSPIRE Data Themes

Explore all Member States' datasets by selecting a data theme.

Annex I

<p>Addresses</p> <p>Def: Location of properties based on address identifiers,...</p> <p>191 112 114</p>	<p>Administrative units</p> <p>Def: Units of administration, dividing areas where Member...</p> <p>628 218 427</p>	<p>Cadastral parcels</p> <p>Def: Areas defined by cadastral registers or equivalent...</p> <p>227 102 108</p>	<p>Geographical grid systems</p> <p>Def: Harmonised multi-resolution grid with a common point...</p> <p>138 55 94</p>
<p>Geographical names</p> <p>Def: Names of areas, regions, localities, cities, suburbs,...</p>	<p>Hydrography</p> <p>Def: Hydrographic elements, including marine areas and all...</p>	<p>Protected sites</p> <p>Def: Area designated or managed within a framework of international...</p>	<p>Coordinate reference systems</p> <p>Def: Systems for uniquely referencing spatial information...</p>

INSPIRE data catalog

Data Sources

In addition to traditional sources of information such as maps, records, plans, etc., satellite data-gathering systems play an ever-increasing role in the provision of geographically distributed data and in surveying and mapping. The services offered include consideration of the application of satellite data to specific projects.

Database Management

Project options can be assessed and real savings in terms of design and construction costs achieved by using a GIS. Costs and uncertainty are minimised by reducing time spent searching for information. The expertise provided by Wimpey Environmental allows the owner to have constant access to relevant information for re-direction of his plans.

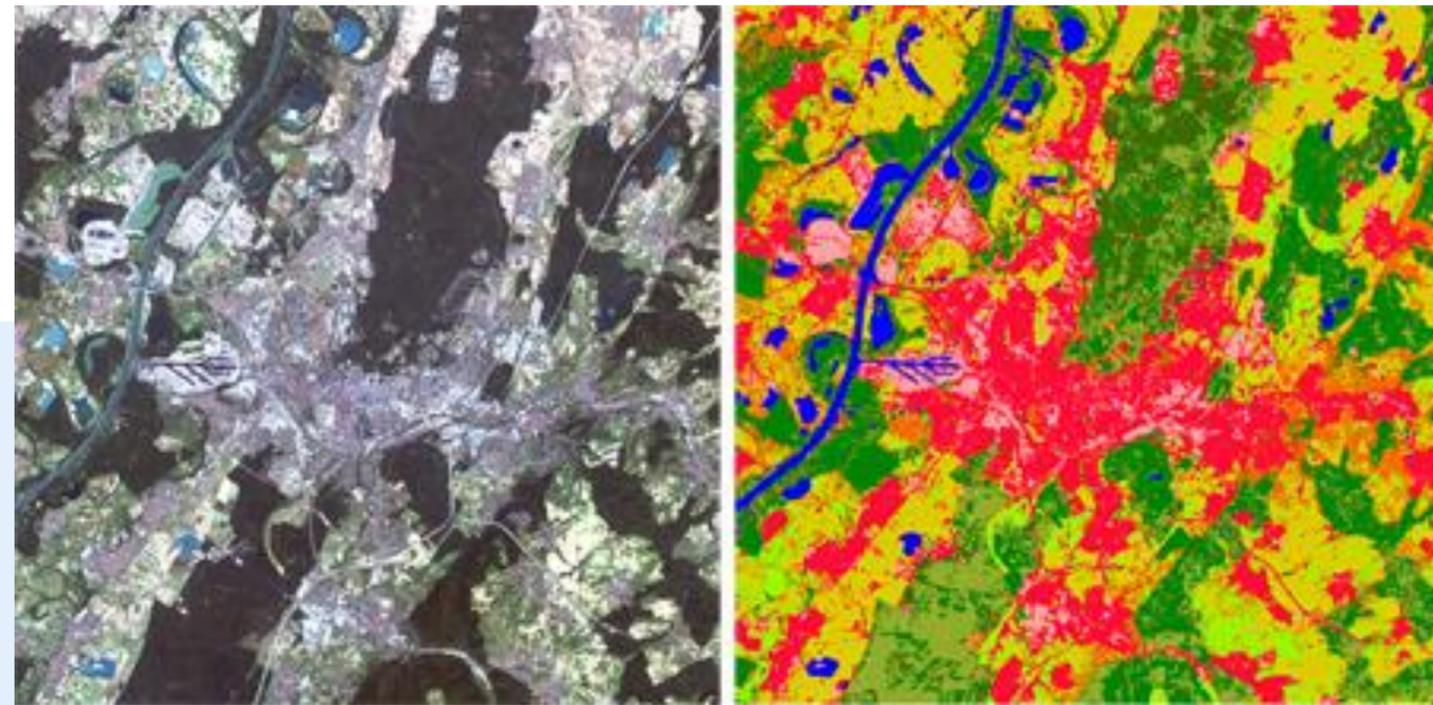
Data Output

Information is held within computer databases and can be utilised as screen display by design engineers. In order to communicate development decisions or to provide a base for field data gathering however, good quality maps and plans at reasonable cost are required. Wimpey Environmental uses the latest map production

GIST brochure, Wimpey Environmental (1989)



AI: Geospatial for 40+ years – early agents - Computer Vision



Satellite Image from the Karlsruhe Region and Classification
Source: [LANDSAT](#) and [© LUBW](#) with modifications

Wikipedia
<https://en.wikipedia.org/wiki/Roomba>

Roomba - Wikipedia

Engineer Joe Jones first conceived the idea for what eventually became the Roomba in **1989** while working at the MIT Computer Science and Artificial Intelligence Laboratory. The initial design, using Lego, stemmed from Jones and his colleagues. Early prototypes were created

Overview

A Roomba is an **autonomous robotic vacuum cleaner** made by the company **iRobot**, and was first introduced in September 2002. Roombas have a set of **sensors** which help them navigate the floor area of a home. ... [See more](#)



Design

Roomba measures enough to fit in most rooms. Most Roombas are measuring 3



[See all on Wikipedia](#)

Wikipedia text under CC-BY-SA license

USING PERCEPTUAL GROUPING TO DETECT OBJECTS IN AERIAL SCENES ¹

Keith Price and Andres Huertas
Institute for Robotics and Intelligent Systems
University of Southern California
Los Angeles, California 90089-0273

Abstract

Mapping, cartography, photointerpretation and guidance are some applications that can directly and readily benefit from automated aerial scene analysis. We have successfully used perceptual organization ideas to analyze aerial scenes and to describe cultural features of interest, such as buildings. Perceptual organization refers to the ability of a visual system to quickly capture representations of structure and similarity among otherwise random elements, features, and patterns in the visual field. We describe some of the systems we have developed and applied to aerial images and present several examples. We also give a brief description of our current work, in particular the development of the concept of a *grouping field* to represent saliency and help define the computational aspects of grouping operations. This paper is based on the work of many different people in our research group with more details of each part found in the referenced papers.

KEY WORDS: Automatic Mapping and Photointerpretation, Aerial Image Understanding, Perceptual Grouping, Computer Vision.

ACRONYM

Scientific Applications
FN Fritsch Editor
An Algorithm for Planning Collision-Free Paths Among Polyhedral Obstacles
Tomás Lozano-Pérez and Michael A. Wesley
IBM Thomas J. Watson Research Center

The problem of avoiding collisions when operating on computer models of physical objects is central to model-based manipulation systems. This paper describes an algorithm for planning safe, that is collision-free, paths for a polyhedral object among similarly described obstacles.¹ The algorithm is required to:
(1) find safe paths that might involve going near obstacles, and
(2) guarantee that these paths are short relative to a prespecified distance metric.
The simplest collision avoidance algorithms fall into the generate and test paradigm. A simple path from start to goal, usually a straight line, is hypothesized and then



Those agents are now smarter & faster



Cantabria, Spain

Courtesy Gabriel Ortiz,
Government of Cantabria,
Spain

[\(13\) Gabriel Ortiz | LinkedIn](#)

1:5.000 Series, 2007 stereo plotting, complex project involving over 1.2 million euros, 20+ people complete QC/QA program. 1 year edited and reviewed many times.

2024 True ortho. 1 Geographer with a single GPU with #AI capabilities, 2 days for training and 1 day for inference + regularization. No editing, just automatic regularization. Revision and QC/QA pending.



Iron Bridge, Shropshire (1779): World's first major cast iron bridge





World Models are driving the next wave of AI

‘A house cat has way more common sense of the world than any LLM.’

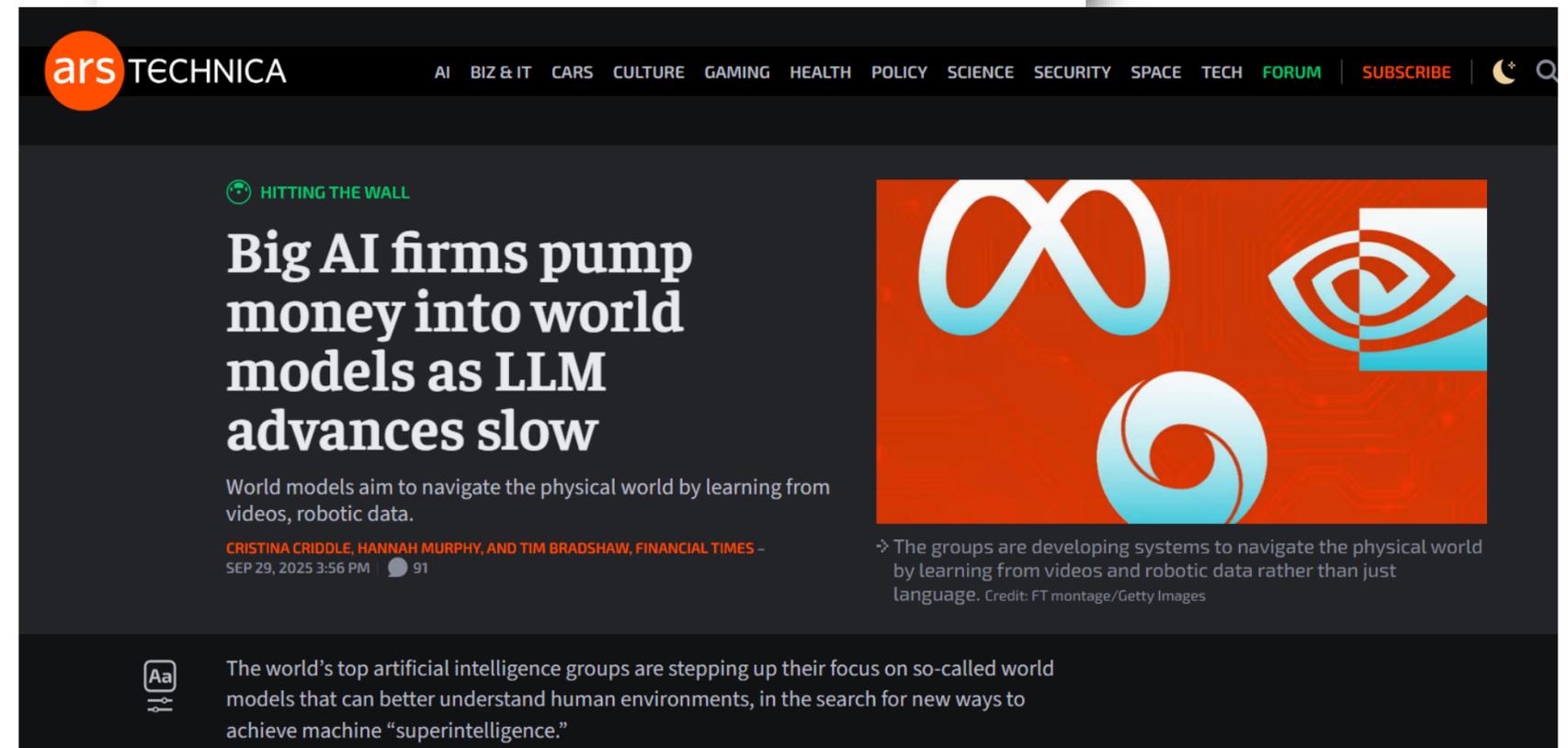
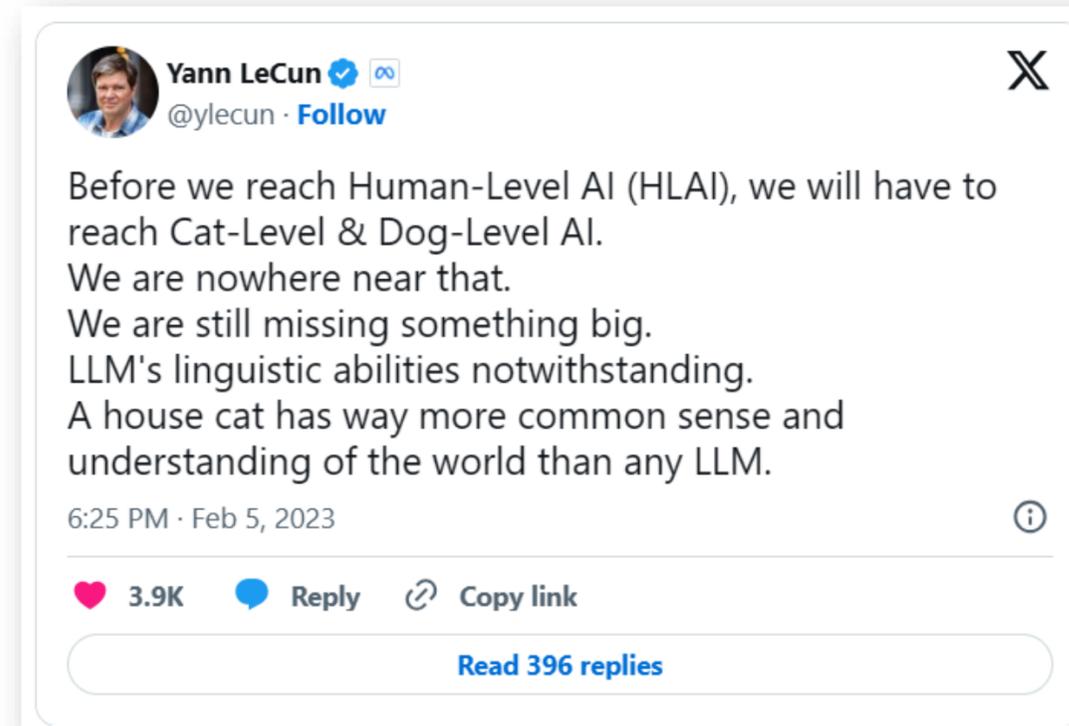
Yann LeCun, Meta’s chief AI scientist

Progress depends on systems that can model the world, remember, reason, and plan¹.

As LLMs reach their limits, reasoning models, world models, and robotics will drive the next AI wave².

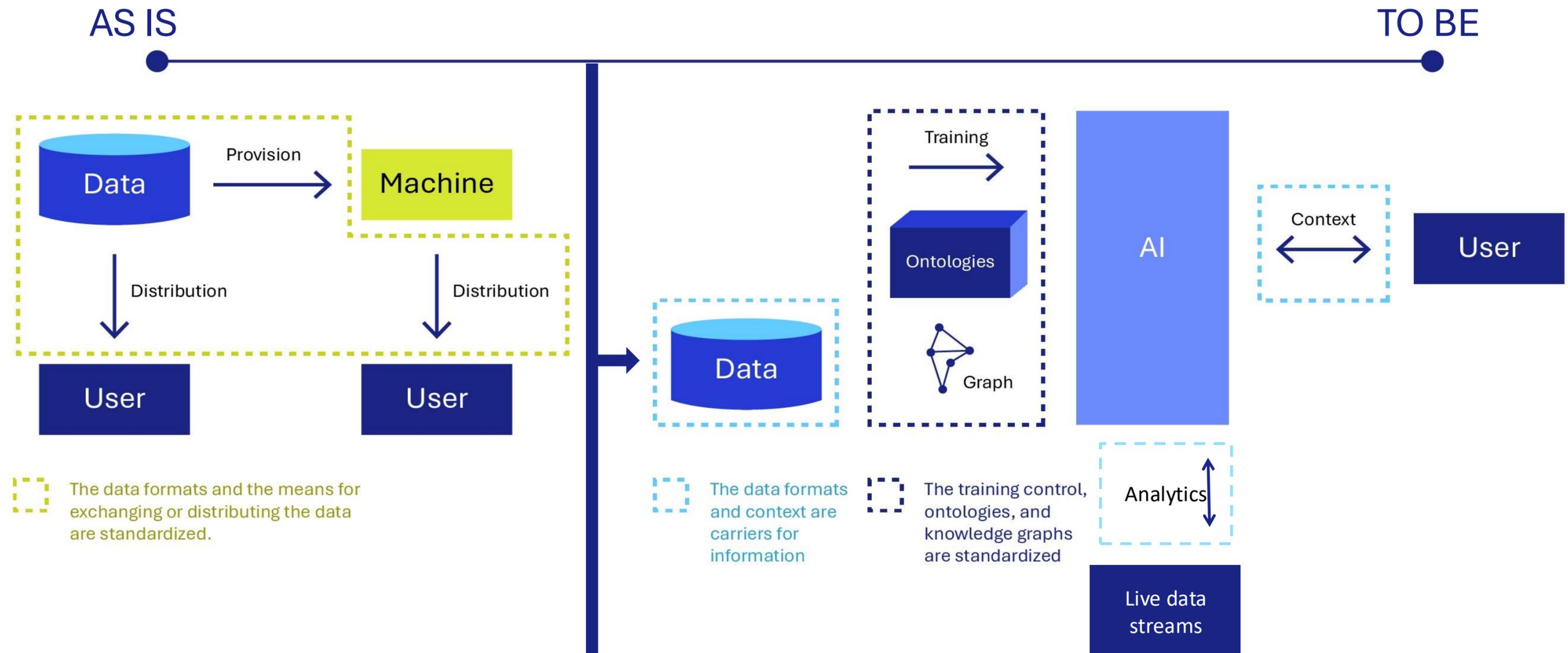
¹<https://www.builderlab.ai/p/why-lecun-is-betting-on-world-models>

²<https://www.1950.ai/post/why-yann-lecun-believes-ai-needs-world-models-not-just-language-models-2>

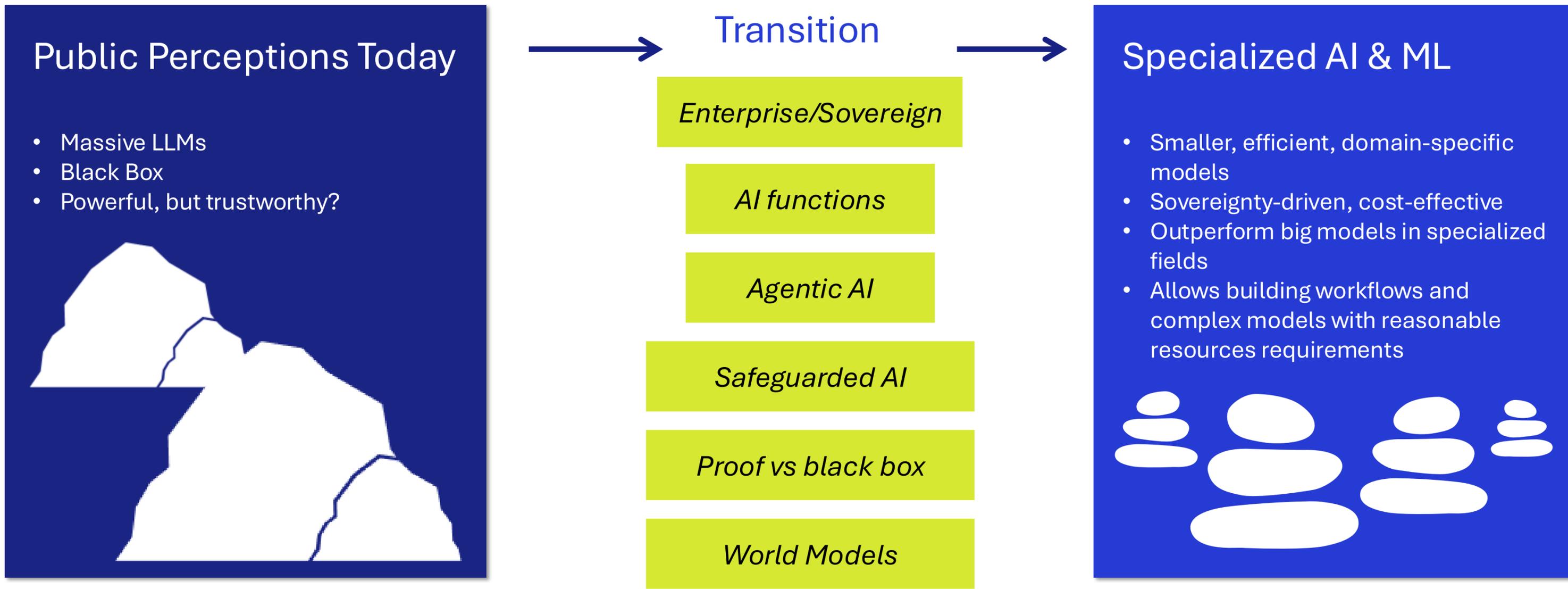


The question isn't "can I get the data?" but "can I trust it?"

From codifying data to codifying knowledge – reusable technical blocks that can be assembled in countless ways to meet the needs of different users, sectors, and geographies



Blocks – a new enabling ecosystem



Real-World Systems:

- Autonomous cars, power grids, underground infrastructure
- AI must be *trusted* and *safe*
- Formalize expert knowledge → ML inference → safety regions → real world data integration at runtime

OGC's Role:

- Integral, not niche: Geospatial everywhere
- Safeguarded AI for spatio-temporal systems
- Support fast innovation & public admin
- Vision: Ask a chatbot, enable a trustworthy system



Proposed OGC principles for AI

- Values and ethics must be operationalized from the outset
- IPT - Integrity, Provenance, and Trust (-worthiness)
- SPA – Security, Privacy, and Accuracy
- AI must always be checked by humans
- Use open models and protocols
- Minimize environmental impact



AI

Anthropic CEO wants to open the black box of AI models by 2027

Maxwell Zeff — 4:28 PM PDT · April 24, 2025

AI: Will it eat Geospatial?

Not really...

Amplify...

Re-orient...

Scale...





Thank you

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