LEAN AND SMART MANUFACTURING CONFERENCE

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using midjourney

Generative AI in Manufacturing

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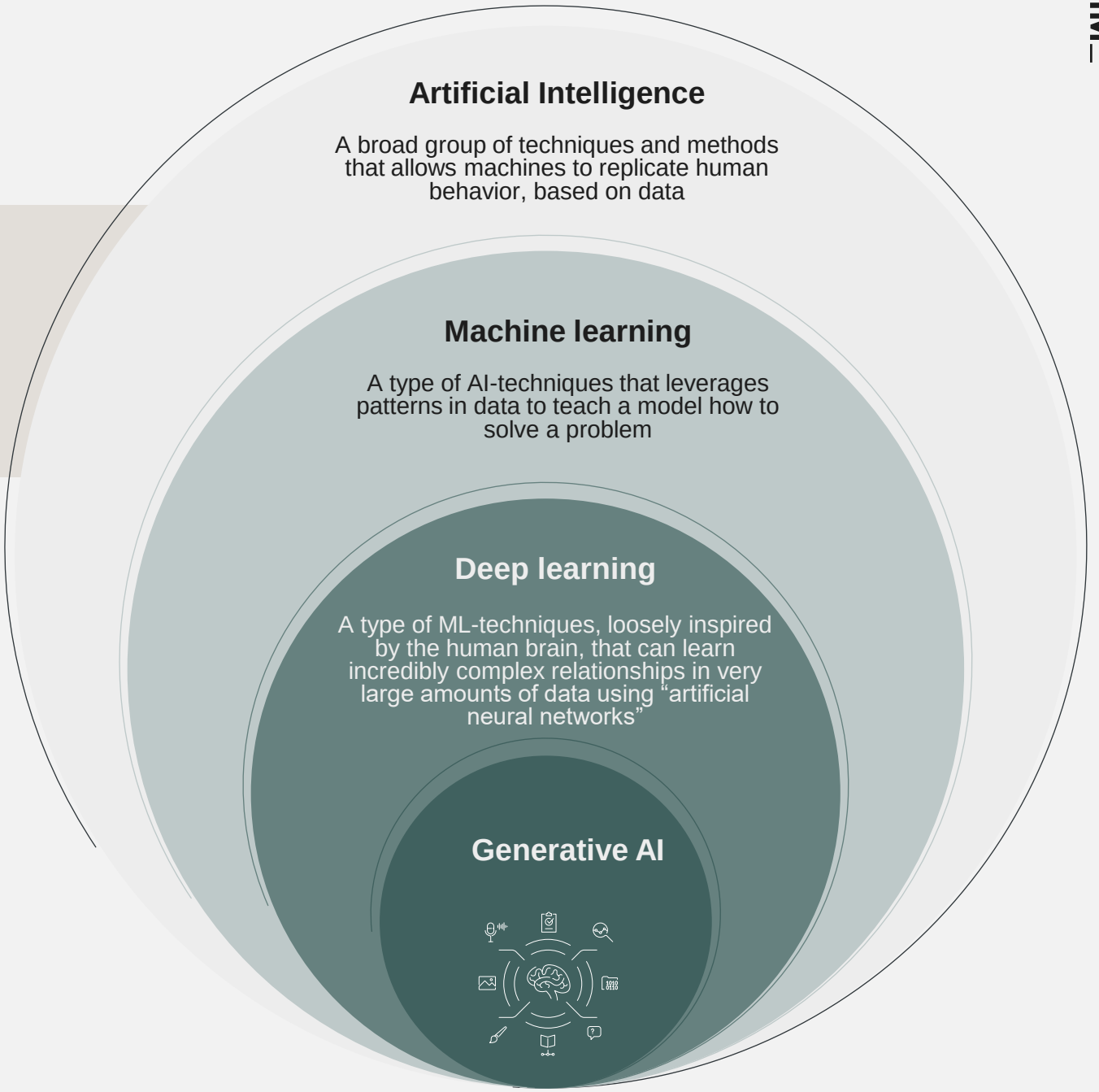
Understanding the terms by unfolding *Artificial Intelligence*



Why?

It’s a new computing paradigm.
A new digital capability.

GENERATIVE AI

/ˈʤɛnərətɪv eɪ-aɪ/

Algorithms that can be used to **create new content**, including audio, code, images, text, simulations and videos.

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Technology

ChatGPT sets record for fastest-growing user base - analyst note

By Krystal Hu

February 2, 2023

CNN BUSINESS Audio Live TV Log In

Snapchat users freak out over AI bot that had a mind of its own

Bloomberg

Technology | AI

IBM to Pause Hiring for Jobs That AI Could Do

- Roughly 7,800 IBM jobs could be replaced by AI, automation
- CEO Krishna says IBM to pause hiring for replaceable roles

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BT is cutting 55,000 jobs. Its CEO says AI could replace 10,000 of those by 2030.

Technology

Elon Musk and others urge AI pause, citing 'risks to society'

Report: Potential NYT lawsuit could force OpenAI to wipe ChatGPT and start over

ChatGPT

This article is more than **2 months old**

Two US lawyers fined for submitting fake court citations from ChatGPT

FOLKESKOLEN

Hver fjerde lærer har oplevet snyd med ChatGPT

Schibsted

Schibsted's key role in developing a Norwegian language model

NEWS

Sweden is developing its own big language model

FORTUNE

TECH · HOLLYWOOD

Writers strike: Why A.I. is such a hot-button issue in Hollywood's labor battle with SAG-AFTRA

Forbes

FORBES > INNOVATION > ENTERPRISE TECH

The Amazing Ways Coca-Cola Uses Generative AI In Art And Advertising

New Zealand

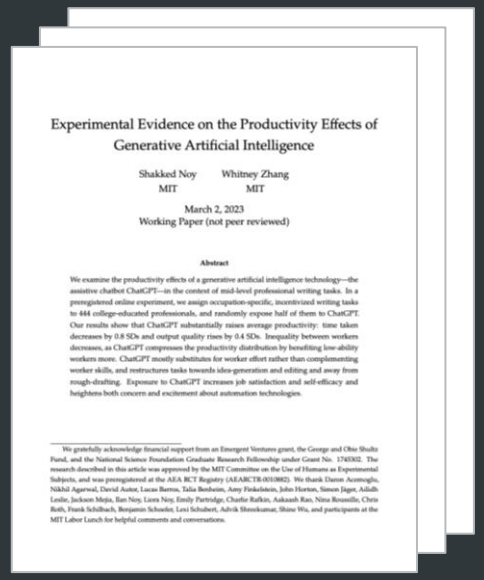
This article is more than **1 month old**

Supermarket AI meal planner app suggests recipe that would create chlorine gas

R KRONIKEN KLUMMER MENU Log ind Kø

CEO for Netcompany: Om lidt er arbejdsmarkedet vendt på hovedet. Er universitetspolitikken klar til det?

ChatGPT banned in Italy over privacy concerns



Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence

Shakked Noy MIT Whitney Zhang MIT

March 2, 2023
Working Paper (not peer reviewed)

Abstract

We examine the productivity effects of a generative artificial intelligence technology—the assistive chatbot ChatGPT—in the context of mid-level professional writing tasks. In a preregistered online experiment, we assign occupation-specific, incentivized writing tasks to 444 college-educated professionals, and randomly expose half of them to ChatGPT. Our results show that ChatGPT substantially raises average productivity: time taken decreases by 0.8 SDs and output quality rises by 0.4 SDs. Inequality between workers decreases, as ChatGPT compresses the productivity distribution by benefiting low-ability workers more. ChatGPT mostly substitutes for worker effort rather than complementing worker skills, and restructures tasks towards idea-generation and editing and away from rough-drafting. Exposure to ChatGPT increases job satisfaction and self-efficacy and heightens both concern and excitement about automation technologies.

We gratefully acknowledge financial support from an Emergent Ventures grant, the George and Obie Shultz Fund, and the National Science Foundation Graduate Research Fellowship under Grant No. 1745302. The research described in this article was approved by the MIT Committee on the Use of Humans as Experimental Subjects, and was preregistered at the AEA RCT Registry (AEARCTR-0010802). We thank Daron Acemoglu, Nikhil Agarwal, David Autor, Lucas Barrios, Talia Bernheim, Amy Finkelstein, John Horton, Simon Jäger, Ashish Leslie, Jackson Mejia, Ilan Noy, Liora Noy, Emily Partridge, Charlie Rafkin, Aakaash Rao, Nitza Rosenfin, Chris Roth, Frank Schilbach, Benjamin Schoefer, Levi Schubert, Ashvik Shreekumar, Shine Wu, and participants at the MIT Labor Lunch for helpful comments and conversations.

Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence

- Zhang et al., MIT, 2023

40%

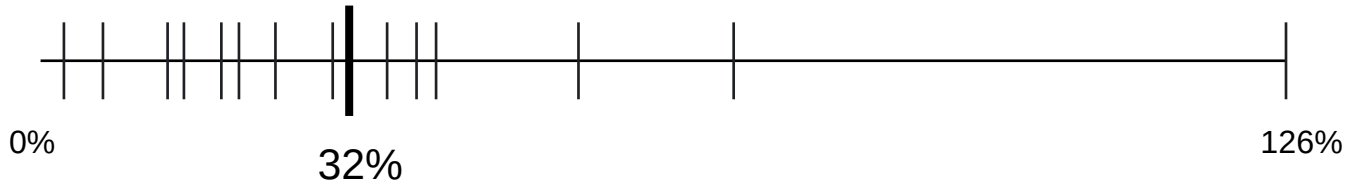
Increased productivity

15%

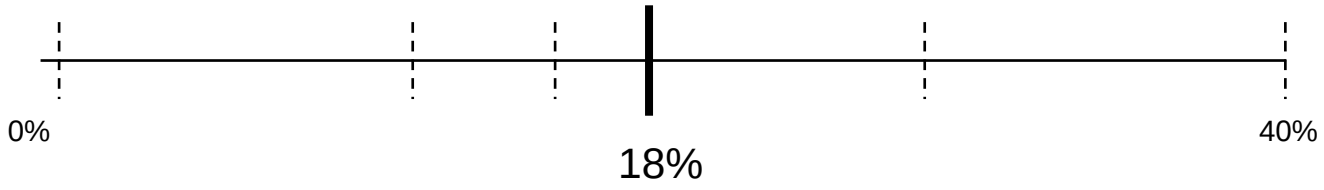
Increased quality

A growing number of studies indicates the *transformative* potential of generative AI in everyday tasks

Studies in *productivity*



Studies in *quality*

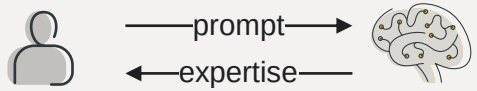


Chang & Noy, MIT (2023), Peng & Kannan, Microsoft Research (2023), Nielsen, Nielsen Normann Group (2023), Tabachnyk & Nikolov, Google (2023), Goldmann Sachs Reearch (2023), Chui, et.al., McKinsey & Company (2023), Mollick etl.el, MIT, Havard, Boston Consulting Group (2023), BrynjofIsson, Li & Raymond, National Bureau of Economic Research (2023), Korinek, National Bureau of Economic Research (2023), Congressional Budget Office (2023)

Implement's generative AI interface framework divides use into four different categories

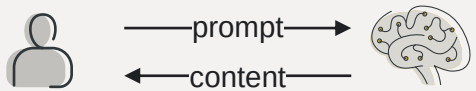
Dialogue

You can use it to simulate a conversation with an expert or brainstorm on a specific topic.



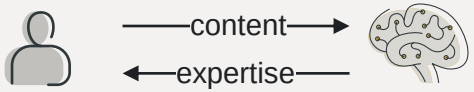
Generate content

You can use it to create content such as drafting an email, a LinkedIn post, a blog post on a topic etc.



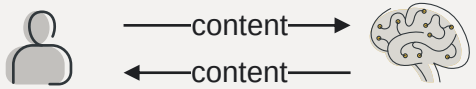
Analyse content

You can use it to extract insights from a text such as sentiment, key point or tone of voice.



Modify content

You can use it to modify existing content such as simplifying, summarising, translating etc.



Use case examples within the Implement GenAI framework

Dialogue

KNOWLEDGE BOT

An internal chatbot based on company information. This would enable new employees to “chat” with manuals, experience employees could query questions about internal processes and company information would be more readily available for all employees.

Generate content

GENERATE DOCUMENTATION

Based on structured data about raw materials and sensor data, generative AI could create (draft) deviation reports and CAPAs.

Analyse content

TRIGGERING COMPLEX ACTIONS

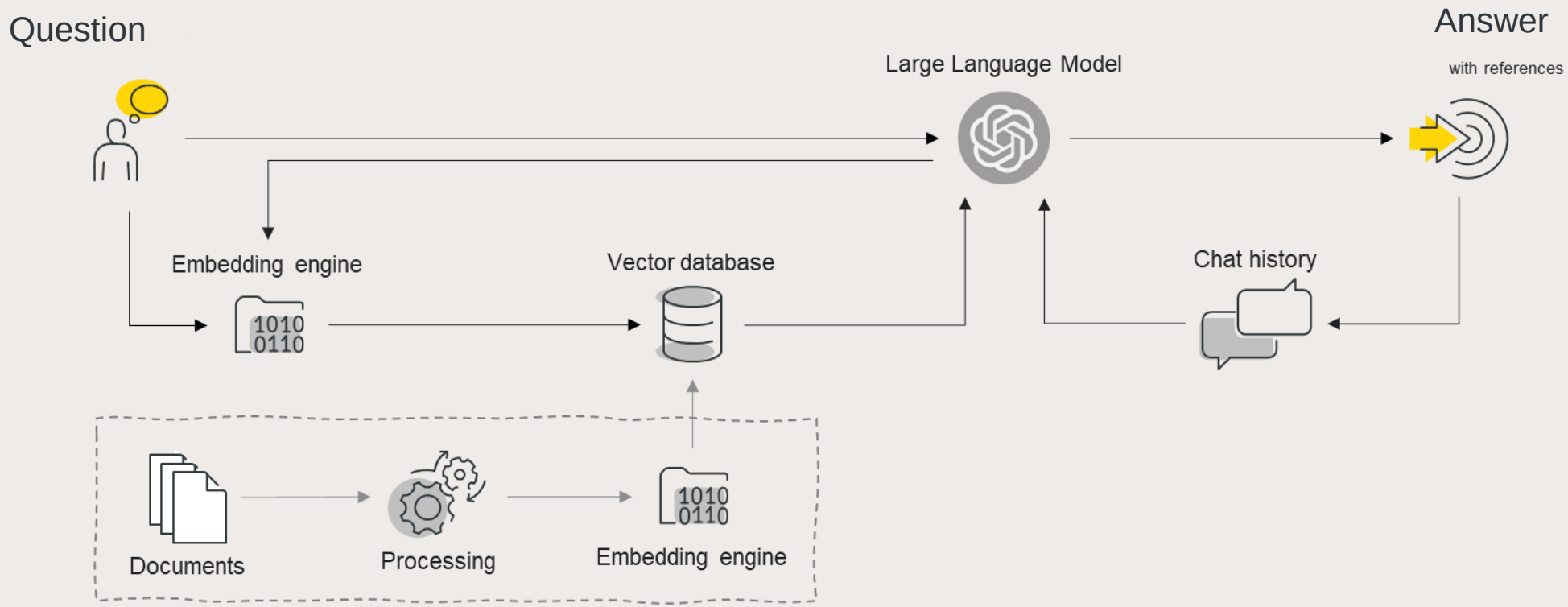
Given a set of complex input parameters, Generative AI assess, reason and trigger certain workflows

Modify content

TRANSLATE TO OTHER LANGUAGES ON DEMAND

Translate manuals, instructions or HMI interfaces to any preferred language.

Generative AI *Retrieval Augmented* Generation



USE CASE EXAMPLE:

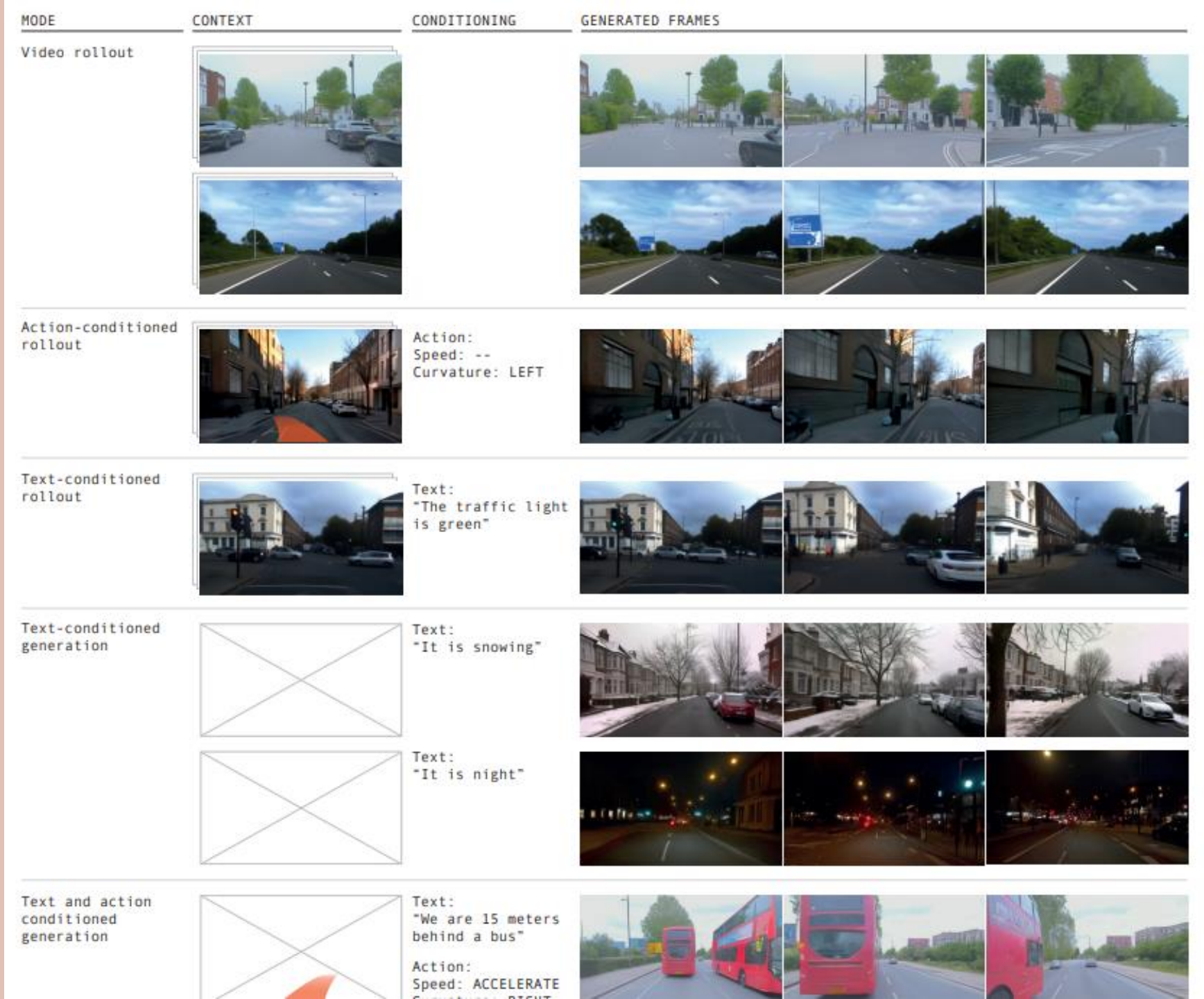
Troubleshooting with help from a Multimodal GPT interface

The GPT model is now multimodal, meaning the model can understand and generate text, speach, sounds, images and videos

Example from Open AI

Using generative models to train vision systems

Generative AI is now being used for the input feed of training sets to vision systems to speed up deployment time and accuracy



Four archetypes for getting started with Generative AI or Advanced Analytics in general

USE CASE EXPLORATION

Identifying the real potential

- Gain deep insights into generative AI technology
- Follow Implements use case discovery framework
- Perform technical feasibility studies of select use cases
- Understand which use case to execute on and how

STRATEGIC INITIATIVE

Ensuring a holistic approach

- Get a full generative AI impact assessment on your business
- Follow a use-case driven approach to ensure value
- Set a strategic direction for one or more business units
- Get AI governance, architecture and infrastructure in place

RAPID PILOT

Rapidly gain experience

- Rapidly develop a prototype in 6-8 weeks
- Showcase value early by bringing the technology into the organisation
- Learning-by-doing approach

PRODUCTIVITY BOOST

Boost output now

- Get up to 40% increased productivity and 15% increased quality on common white-collar tasks
- Scientific-grade research backing
- Best path to prepare for technologies like Microsoft Copilot

Q&A