
Emerging technology trends in the Middle East 2025



pwc

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Introduction

The Middle East has experienced a swift trajectory of emerging technologies in recent years, driven by increasing recognition of their potential to foster a culture of innovation, connectivity, and contribute to global competitiveness and economic diversification.

This report explores the concepts that will dominate the technology landscape's conversations in 2025, and offers a glimpse into the success stories of emerging technologies in the Middle East. It also emphasises the importance of organisations establishing their own research and development teams to secure a competitive edge and stay ahead of the curve.





The impact of innovation labs

Innovation labs are collaborative environments that foster new ideas and experiences, as well as enable experimentation with cutting-edge technologies. They act as a dynamic space where organisations can discover emerging market trends and gain insights into challenges faced by internal and external stakeholders.

All industries are under pressure to innovate. To maintain a competitive edge, an organisation must approach problems proactively and strategically, ensuring quick and effective responses to market demands.

Innovation labs are on the rise across the region, driving collaboration between industry, academia, and government. These labs are shaping the region's knowledge and innovation landscape. By leveraging the expertise and insights of internal subject matter experts and partners, organisations can explore the most effective ways to address challenges and increase their chances of successfully securing organisational support.

The key to a successful lab

The key to a successful Innovation lab is agile experimentation and prototyping, driven by continuous research, iterative design, and development. The purpose of the lab shapes the approach to exploring emerging technologies - this can be through concept validation, solution deployment, or industry research to drive meaningful innovation and impact.

Strategic and organisational alignment

The success of an innovation lab hinges on its integration with the business and its alignment with the strategic goals and needs of the organisation, with its impact on key performance indicators (KPIs) forming the foundation of leadership buy-in.

Space functionality and design

A well-designed innovation lab is adaptable, with dedicated spaces for emerging technologies, like AI and immersive tech. Ideas originate in testing labs for validation in co-creation spaces. A demo zone is essential to showcasing innovations.

Skillsets and talent

The skillsets present in innovation spaces require both creative and technical individuals. Researchers, user experience (UX) specialists, developers, and innovation consultants are needed to support across the typical innovation funnel from idea to execution.

Culture and environment

Having culture and experimentation as a mindset is fundamental to instilling the right mindset and creating an environment that encourages challenging the status quo, thinking outside the box and embracing experimentation to deliver impactful solutions.



Innovation labs in the region

Innovation labs exist in various forms, each defined by the strategic objectives and long-term goals of the institution that operates it. The structure, focus area, measure of impact, and success assessment depends on those distinct goals.

Government labs

Government labs focus on cross-sector collaboration and improving public services with emerging technology.

Government focused innovation labs are driving collaboration across key public sectors through partnerships with other government entities, industry leaders, and global companies to drive digital transformation goals. Dubai Future Labs, for example, is a government-led lab under the Dubai Future Foundation, that acts as a strategic hub for experimenting, researching and developing emerging technology solutions in the fields of artificial intelligence and robotics.

Industry specific labs

Industry specific labs (or business-led labs) are built to deliver products and solutions that show real-world impact.

Industry specific labs are designed to allow businesses to adopt emerging technologies and explore how they can drive efficiency and business transformation. PwC's Emerging Technology Labs operate across the region including UAE, Qatar, Saudi Arabia, and Jordan. It harnesses the transformative potential of emerging technologies to produce rapid prototypes that can be tested and validated. Also, conducting research to address critical business challenges, delivering substantial value to both internal stakeholders and clients.

Academic and applied research labs

Academic and applied research labs prioritise upskilling, experimentation with hands-on tools, and knowledge transfer.

Academic innovation labs play a crucial role in advancing research, nurturing talent, upskilling and educating people whilst integrating emerging technologies into learning and development environments. The King Abdullah University of Science and Technology (KAUST) in Saudi Arabia is fostering interdisciplinary collaboration and leveraging advanced technologies such as AI, robotics, and immersive technology to tackle global challenges.



The evolving AI landscape

Artificial Intelligence has rapidly evolved in the region, showcasing transformative applications and fostering a deeper understanding of its capabilities and potential.

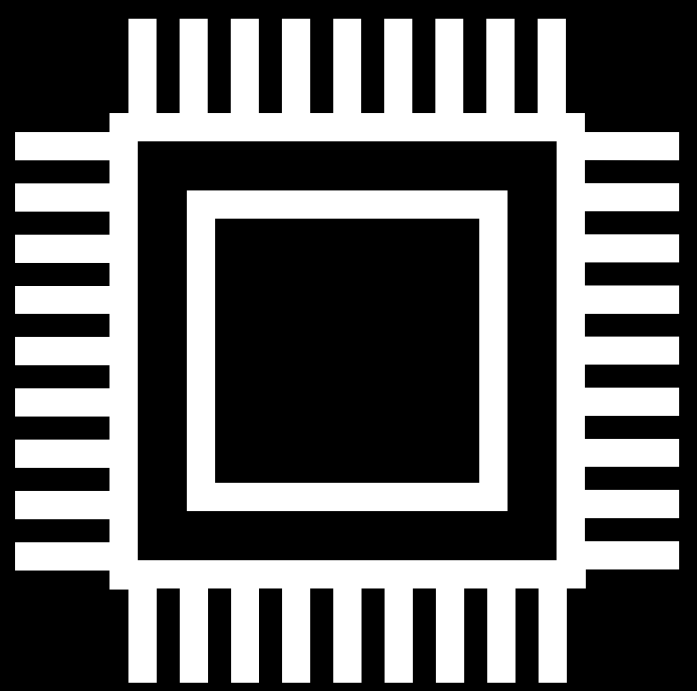
Driven by governments and global partnerships, the Middle East has made remarkable progress in emerging AI technologies, with various countries in the region leading the charge by developing advanced Large Language Models (LLMs) and initiatives - each marking a significant step towards greater inclusivity and regional adaptivity in AI.

Each paradigm shift in emerging technologies reshapes infrastructure demands, business applications and market needs. Artificial intelligence evolves in waves, with each aspect being initially applied to niche fields before it breaks out into widespread adoption. We are entering agentic AI and an era of models that go beyond outputs and are making decisions and adapting to challenges in real time.

The path to superintelligence

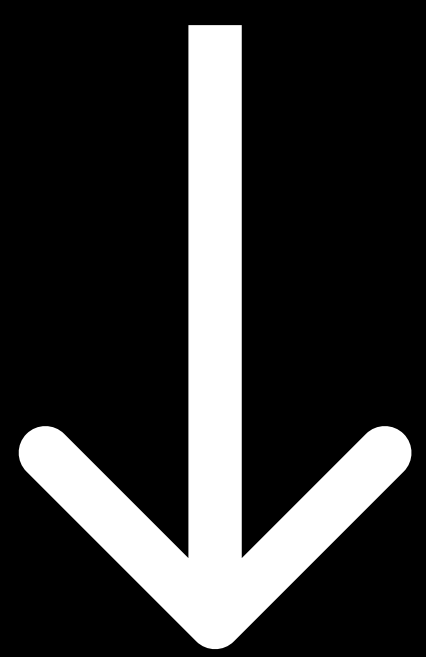
Artificial narrow intelligence (ANI)

AI designed for specific and predefined tasks



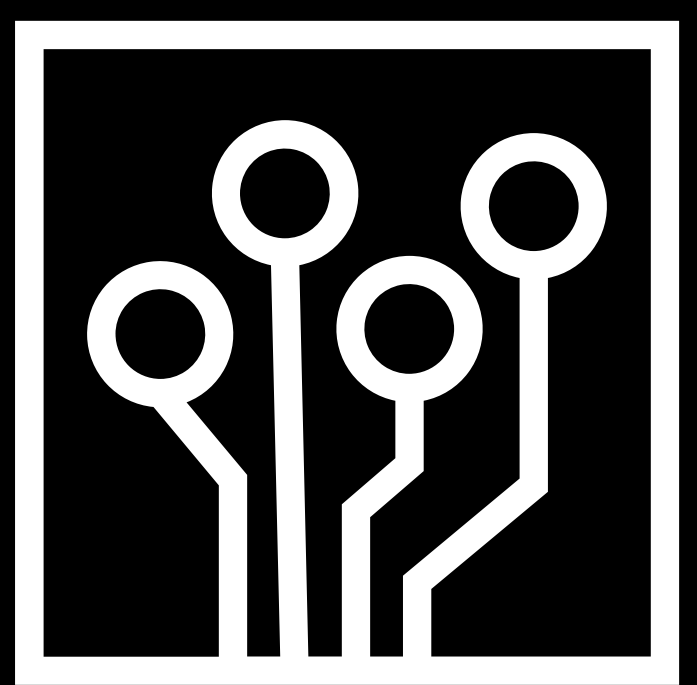
AI applications that fall under ANI include voice assistants, natural language processing (NLP) models, and facial recognition.

ELIZA, known as the first chatbot developed in the 1960s, marked a breakthrough in¹AI . Most AI use cases today are goal-oriented ANI, designed for specific tasks with predefined² rules .



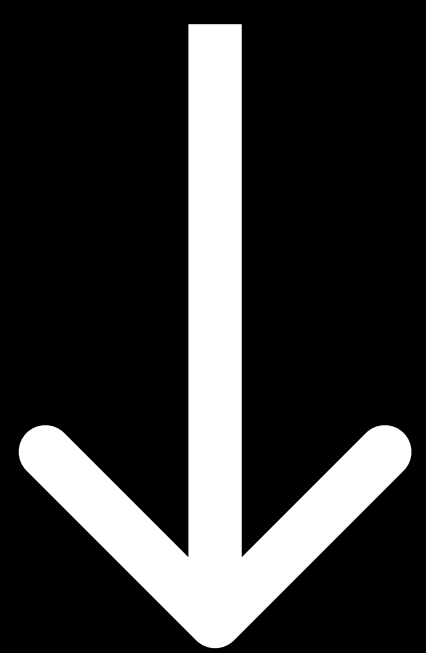
Artificial general intelligence (AGI)

AI that thinks, learns and adapts like a human



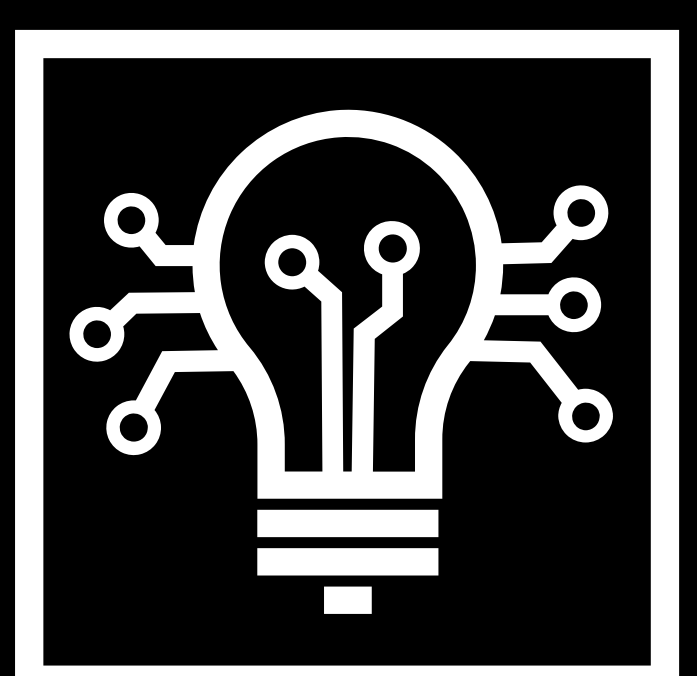
Marked as the next era of AI, AGI will exhibit human-like intelligence, learning and reasoning^{3 4}.

AGI's potential lies in solving inefficiencies autonomously. However, infrastructure demands and aligning AGI's goals with human values present to be a challenge.



Artificial superintelligence (ASI)

Machines with capabilities beyond a human's across all domains



ASI is an intelligence that surpasses human cognition, capable of independent reasoning and even emotional intelligence⁵ . ASI raises profound questions about control, ethics, governance, and the future of human-computer interaction.

The rise of Arabic LLMs

Arabic, a language spoken by over 400 million people worldwide, only makes up about 3.5% of web content⁶.

The recent boom in the quality and volume of LLMs is enabled and supplemented by the exponential growth of publicly available data.

The scarcity of annotated and pre-trained Arabic data complicates the process of fine tuning and customisation of Arabic AI applications⁷. The dialect variations⁸ within Arabic require their own high-quality datasets as each differs in rules, phrasing and sentence structure.

These models underscore the importance of ensuring that AI systems are not only capable but also representative of the diverse cultures and languages they aim to serve.

Achieving this requires integrating these principles at every level of the AI ecosystem – encompassing data collection, algorithm design and practical outcomes.

The development of Arabic LLMs represents a pivotal moment in the evolution of AI in the region, highlighting the critical need to address diversity and inclusion in technological advancements.

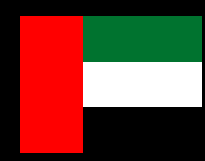


LLMs across the Middle East

The Middle East has been extremely proactive in investing in AI infrastructure and research, customising LLMs to suit regional needs that reflect the linguistic and cultural diversity of Arabic speakers, ensuring we are always moving forward as a society:

Falcon 3

Technology Innovation Institute (TII)



Aligned with the UAE’s National AI Strategy, Falcon 3 combines low compute requirements with high-quality results⁹, enabling the model to run on light infrastructure such as laptops.

1

ALLaM 3

Saudi Data and Artificial Intelligence Authority (SDAIA)



ALLaM has created a robust foundation for Arabic NLP by launching on an enterprise AI platform in partnership with Microsoft Azure AI Model Catalog and IBM¹⁰. These strategic partnerships allow for the advancement of an Arabic AI ecosystem.

2

Fanar

Qatar Computing Research Institute (QCRI) at Hamad Bin Khalifa University, with support from MCIT

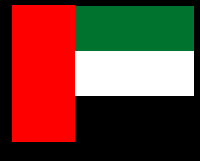


Fanar is trained on culturally and religiously aware datasets, meaning it recognises many cultural expressions and diverse dialects. Supporting text and image generation as well as voice interaction, it has a suite of applications including a playground¹¹.

3

Jais

G42’s Inception and Mohamed bin Zayed University of Artificial Intelligence (MBZUAI)



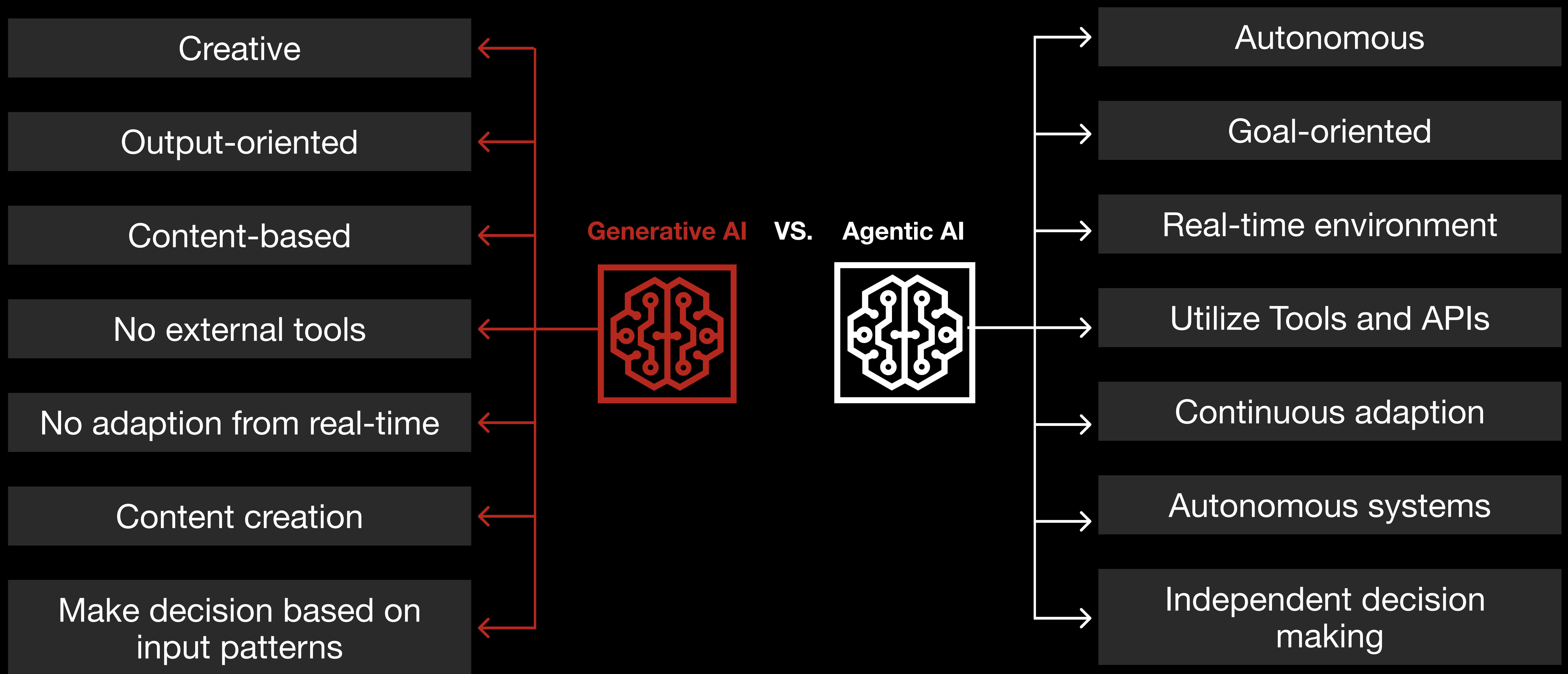
By blending high-calibre English and Arabic datasets, Jais overcomes the scarcity of Arabic annotated data, tailoring this model for the region from a linguistic and cultural perspective¹².

4

As momentum builds around regionally tailored LLMs, the Middle East is positioning itself as a key player in the global AI landscape. The region is well placed to scale its AI capabilities in a way that aligns with global benchmarks while maintaining cultural and linguistic relevance. Strengthening infrastructure such as data governance frameworks, compute power, and access to high-quality datasets will be key to sustaining this growth and innovation across the region.

The next wave of AI: Redefining intelligence

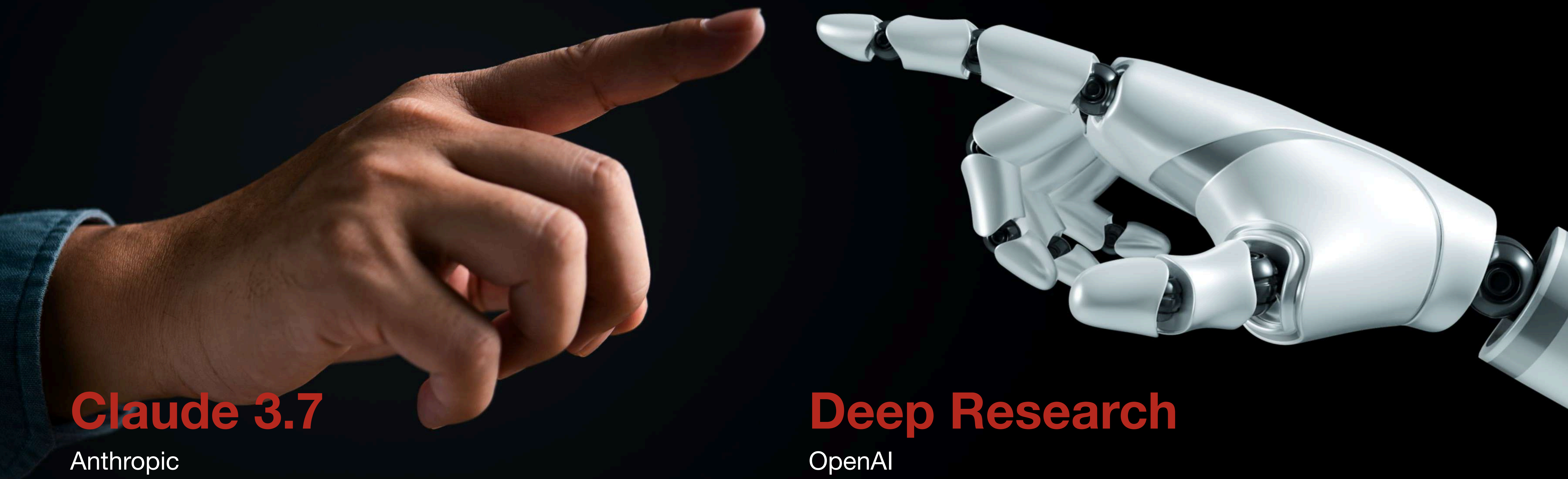
Generative AI (GenAI) marked a breakthrough in artificial intelligence, enabling the production of content that can write text, generate images, and simulate realistic dialogue. While this is based on learning patterns and producing output that mimics human creativity, it lacks in real-world action. Entering the next wave of AI means agentic systems that can set goals, operate autonomously in dynamic environments, and executing what generative AI creates without constant human input.



From early predictive models, to the rise of generative AI, and now to agentic AI systems that can act, adapt, and make decisions autonomously - each wave represents a leap in both functionality and impact. Understanding this progression is essential to recognising where we are today and what the next frontier of AI will look like.

From language to action: Agentic AI

Agentic AI marks a shift in the AI landscape where models are moving beyond responses and to actively making decisions and adapting to their environment. The race is on among tech giants to develop their own versions of autonomous AI systems and redefine how humans interact with them^{13 14}.



Claude 3.7

Anthropic

Anthropic's computer use feature enables the Claude LLM to interact with desktops, mimicking human actions like moving the cursor, typing, and clicking. Normally, directing AI to perform these tasks intuitively would require multiple steps¹⁵.

Deep Research

OpenAI

The Deep Research feature enhances ChatGPT, making it operate as a research analyst providing in-depth insights on complex topics. Utilising reasoning and RAG, it's capable of handling intricate tasks independently¹⁶.

Next-gen AI labs: Scaling innovation with multi-agents

PwC Middle East's Emerging Technology Lab developed an Agentic AI lab, a prototype modeled after the physical innovation labs in PwC Middle East in the region. Using Microsoft Autogen, it employs a multi-agent approach, where AI agents mirror key team roles to conduct research, generate insights, and produce business-ready solutions across different domains and industries. Each agent is powered by the model best suited to its function:



GPT-4o

For the project manager's reasoning and orchestration.



Deepseek-R1

For the technical researcher with its analytical abilities.



DALL-E 3

For the graphic designer for image generation.



Immersive technologies

Redefining immersive technologies

The continued rise in the adoption of immersive technologies has reshaped consumer expectations and redefined the standards for evaluating their maturity and impact. The focus has shifted toward how well these technologies blend physical and virtual realities, integrating seamlessly into daily routines to enhance productivity and overall user experience.

Immersive tech is already benefitting from this convergence, with AI playing a major role in transforming Extended Reality (XR) - elevating it from personalised environments to entirely new levels of immersion.

The power of convergence: Immersive AI (XR x AI)

Immersive AI is the convergence of immersive technologies with artificial intelligence creating responsive and customised experiences.

AI-powered wearable technology unlocks unprecedented use cases, making them more than just visual displays, but worlds that are intelligent and interactive.

The high expense of producing immersive experiences is a barrier to entry for many companies; however, incorporating AI into the development and experience of these devices reduces long-term development costs and the need for constant updates or redesigns.

This emerging field is studied by several world-leading research institutes, including Google Health, Intel Labs, Microsoft Research, Stanford Vision and Toyota Research Institute¹⁷.

An AI company, Decart, developed Oasis - a platform that can create real-time interactive elements and responsive gameplay, enabling personalised and adaptive gaming experiences¹⁸.

Immersive AI use cases



Training and education

The Middle East constantly adopts innovative healthcare solutions to create a risk-free environment for medical training.

At GITEX 2024, the UAE's Technology Innovation Institute showcased a digital avatar powered by the Falcon LLM¹⁹. The avatar interprets complex medical data using multi-omics analysis, enabling early detection of diseases. The convergence of AI and XR has promising applications in immersive and interactive training experiences for medical professionals.



Marketing and tourism

The tourism industry is embracing immersive technologies to unlock new possibilities for historical site engagement, interactive storytelling, and the preservation of cultural heritage.

PwC's Emerging Technology Labs recently developed a mixed reality landmark viewer prototype that enables users to experience physical landmarks through a first-person virtual reality perspective. The experience is enhanced by GPT-powered AI tour guides and the latest virtual reality headset features such as passthrough and hand-tracking technology.

The ergonomics of a wearable headset

The commercialisation of AR and VR headsets for the mass consumer market has helped the industry better understand what makes a good headset beyond virtual and sensory realism. Factors like ergonomics and aesthetics are just as critical, among many other features that play a role in user adoption:

Weight

For every 33 gms of weight added to a headset, it yields an average of 11 fewer minutes of comfortable wear time and can cause neck strain and fatigue²⁰.

Field of View (FoV)

A narrow field of view may cause tunnel vision, which affects the sense of presence of the user, increasing sickness and fatigue during movement while wearing the headset²¹.



Appearance and aesthetics

Mirroring conventional eyewear allows users to experience immersivity without severing their connection to the real world²², and harbour social acceptability.

Cultural considerations

In the Middle East, putting on a headset can conflict with traditional attire like head coverings or loose-fitting clothing, which can affect usability and acceptance of immersive devices.

The wearables of the future

Expectations of smart headsets will continue to evolve moving forward.

Meta Orion

Meta's prototype of its first augmented reality glasses with a holographic display, eye tracking, smart AI assistant, all at 90 grams and the style of near-conventional glasses²³. Orion is controlled by an EMG wristband that lets the user control the headset without moving their hand.

Project Moohan

Project Moohan is a headset built by Samsung specifically for Android XR²⁴. It will have multi-modal input, an ergonomic lightweight design and passthrough capabilities to allow the user to stay aware of their surroundings while, for example, using Google Maps on the headset.

Halliday DigiWindow Glasses

Unveiled at CES 2025, Halliday's lightweight (35g vs the usual 75g) smart glasses have the world's smallest display module projected on the upper right corner of the glasses²⁵. One of the key features is 'cheatsheet', which can provide wearers with a discreet script as they give presentations, instant translation and voice recordings. The glasses come with a control ring for the user to input commands, respond to notifications and switch between functions.





Intelligence meets automation: Robots of the future

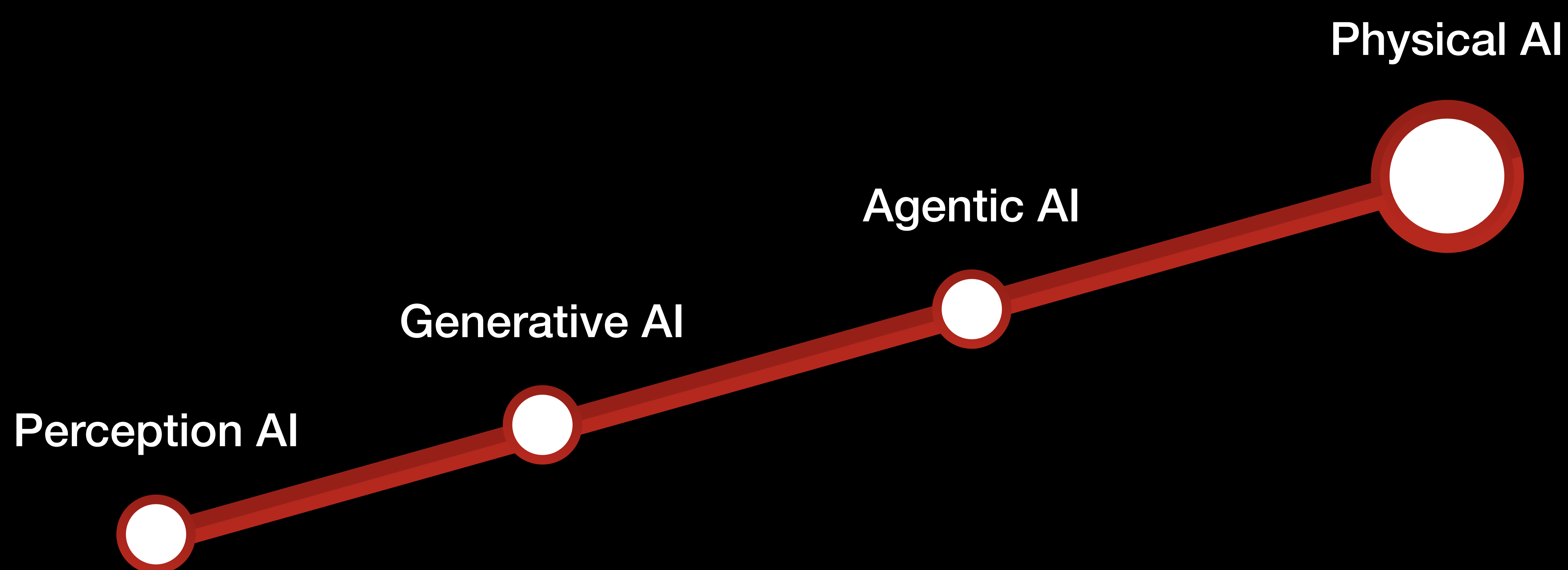
Robotics are transforming in this era of AI-driven intelligence and automation converging with the physical ability to adapt dynamically to their environment.

The Middle East has made significant progress in robotics. Saudi Arabia's DeepFest 2025 served as a key platform for showcasing advancements and sparking dialogue around robotics and emerging technologies. In Qatar, Hamad Medical Hospital recently used a surgical robot to successfully perform an artery bypass grafting procedure²⁶, marking a major milestone in medical robotics.

Innovations in collaborative and humanoid robots along with the advancements in AI are going to redefine and drive efficiency rates and implementation.

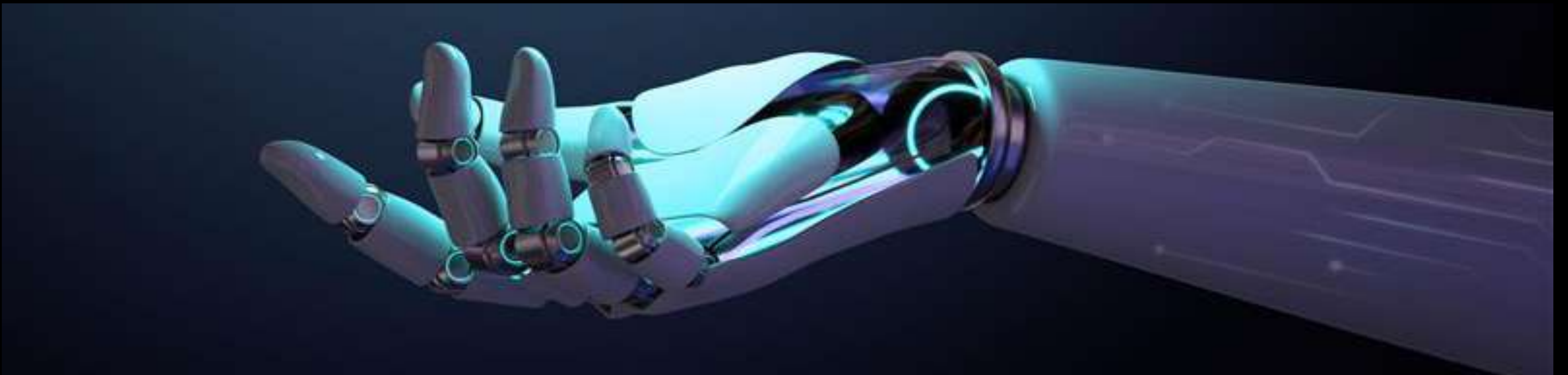
Physical AI's role in robotic evolution

With advancements in both hardware and software for robotics - alongside continued evolution of AI- mass adoption for commercial and industrial robots is becoming a reality. Physical AI is reshaping the robotics landscape, enabling robots to interact with the world dynamically and with more intuition, with less need for explicit instructions to do things that were previously beyond the scope of their capabilities. Increased competition in advanced robotics has led to a surge of innovation among companies and startups, accelerating the technology's maturity at an unprecedented pace.



Physical AI

Physical AI enables autonomous machines such as robots and self-driving cars to perceive, understand and perform complex actions in the real (physical) world. It is also often referred to as “generative physical AI” due to its ability to generate insights and actions to execute on²⁷.



Navigating the functionality of advanced robotics

Various types of robots are emerging to address the different aspects of what it means for robotics to be widely used and accepted. From appearance to functionality, we can expect to see multiple iterations of different robots in the coming years that will focus on improved productivity.

Humanoid robots

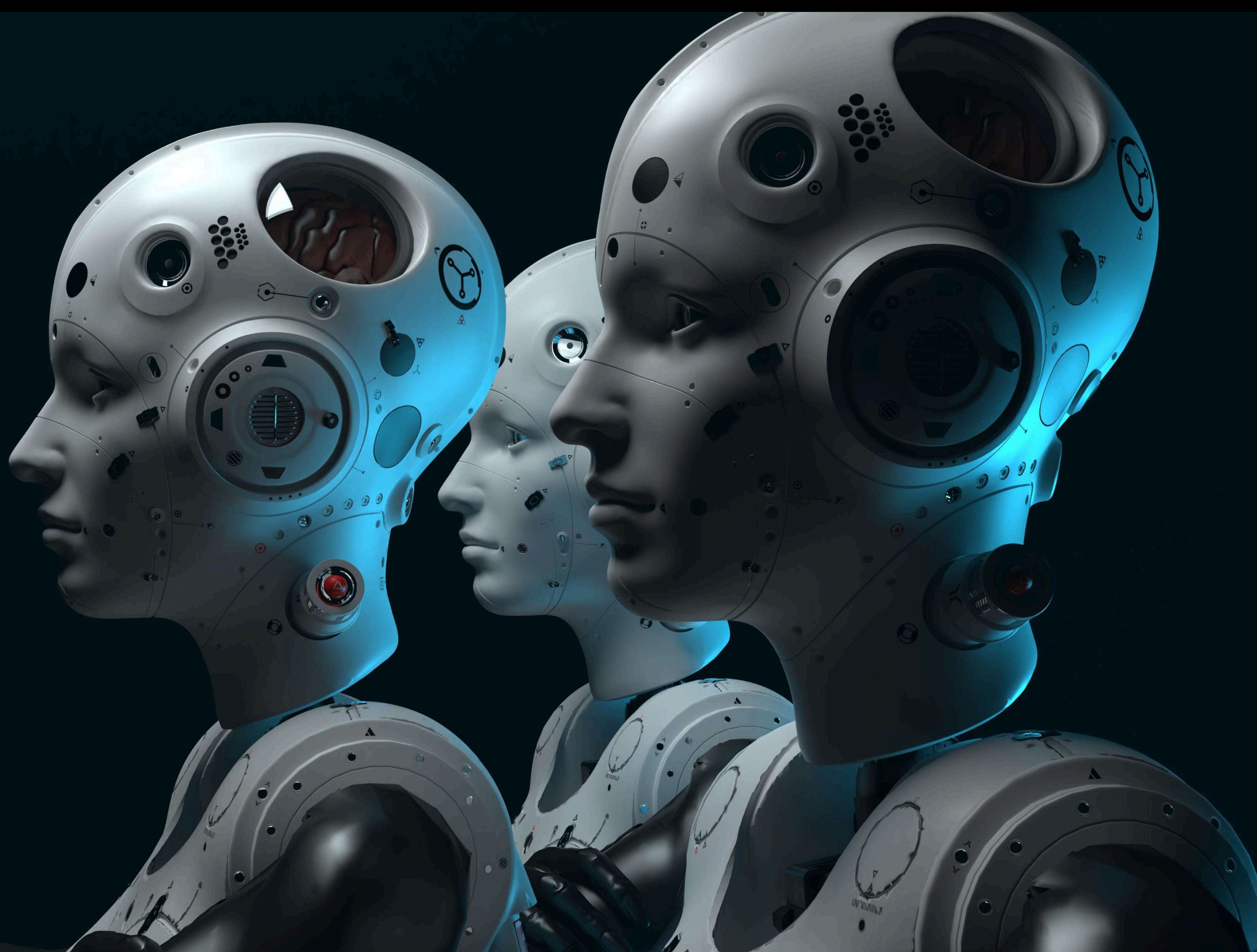
Humanoid robots have spatial awareness through sensors and cameras, and have autonomy to move and learn on their own from their environment²⁸. They are designed to look and act like humans, making them suitable for human-facing roles such as cooking, cleaning, and labor-intensive work like lifting and assembling items.

Cobots (collaborative robots)

Human-robot collaboration is meant to allow for seamless interaction of robots alongside humans in the same workspaces. Co-bots are ideal in both manufacturing and real-world environments. They can help with anything from quality checks to practicing sports.

Aerial robots

Aerial robots are autonomous or remote-controlled systems engineered to be airborne and equipped to navigate environments with GPS, cameras, and sensors. Commonly known as drones, they are being used in surveillance, delivery, and emergency responses. They are ideal for tasks that may be too dangerous or hard to reach for humans.





Way forward

Human-computer interaction is a vital aspect of the success of emerging technologies and the convergence of technologies redefines how machines integrate into our lives. Emerging technologies do not exist in isolation. Innovation labs that conduct research and development offer organisations the power of getting ahead of the curve while being able to control the innovation environment within the context of business needs.

The rise of AI and GenAI has redefined what it means to be technologically proficient in 2025. Now is the time to invest in R&D, build robust infrastructures, and harness the transformative power of technology.

The Middle East findings of our 28th Annual CEO Survey²⁹ have revealed that in the region CEOs feel traditional models of business are increasingly unsustainable in the face of transformative catalytic shifts, primarily driven by AI. A notable 88% of GCC CEOs have adopted GenAI in the last 12 months, reflecting significant confidence in the technology's potential. 70% of GCC CEOs also believe that GenAI will increase profitability in 2025.

This strategic focus on emerging technologies underscores the region's commitment to global technology leadership. By fostering innovation, embracing convergence and prioritising responsible AI, the region is not only reshaping industries but also setting a benchmark for others to follow.

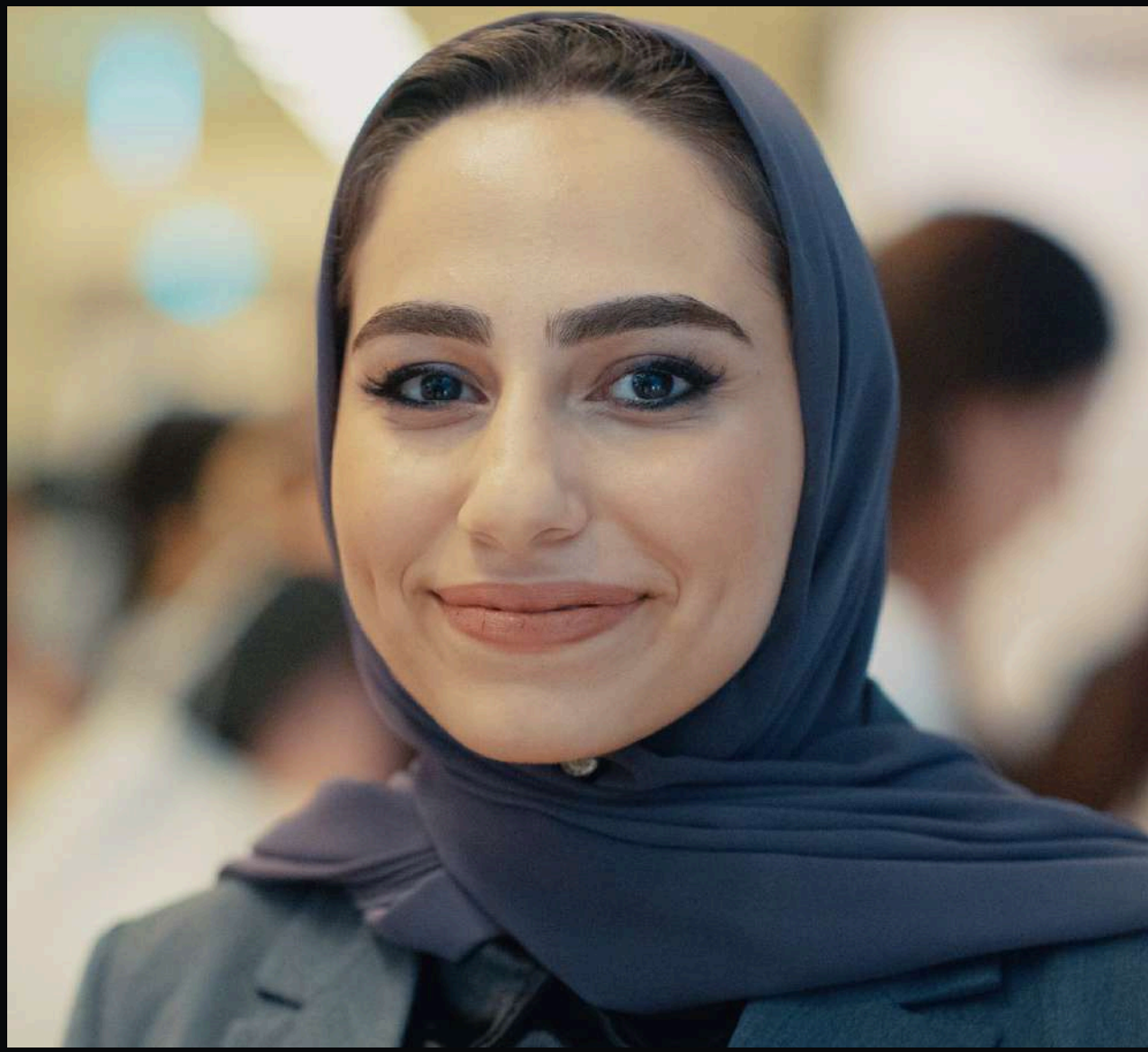
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Disclaimer

Given the rapid acceleration of AI and the pace at which technology is evolving, the trends outlined in this report reflect the current landscape as observed today. However, it's important to note that these trends are dynamic and will continue to evolve.

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