AI-Powered Senior Care: Current Applications & Future Development

Dr. Max Zhou
Founder/CEO of DexRobot and DexSenior

Why am I here?

Dr. Max Zhou

Entrepreneur of a Robot company

Technology should first benefit those who need the MOST

GIES 2024

Aging Demographics

The population aged 65+ in Hong Kong was ~1.5 million in 2021 and is forecast to reach ~2.52 million (31% of the total population) by 2039 (*Source: Health Bureau, HKSAR Government*).

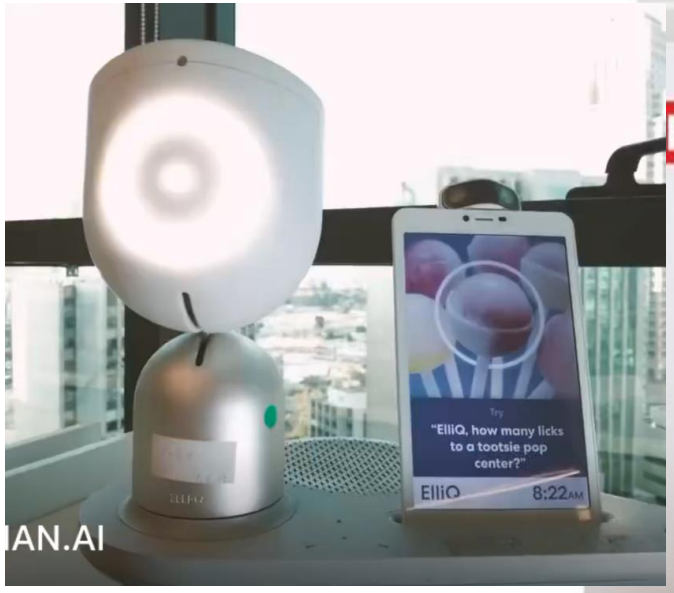
Gerontechnology Market

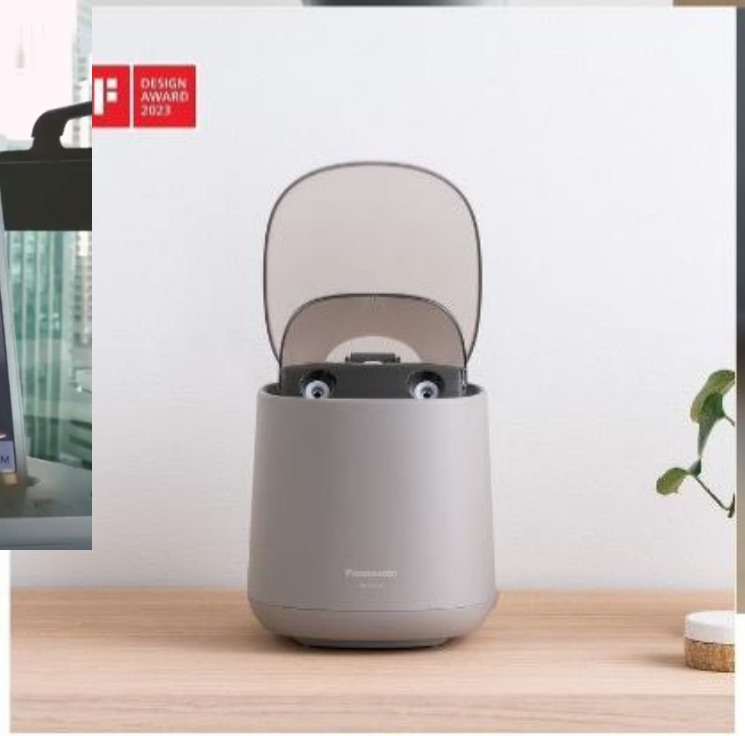
The market is anticipated to achieve a growth rate of approximately 15% per annum (2025-2030), with a potential scale exceeding HKD 10 billion.

27 May 2025

AI Pets

Desk Top AI Agent





Indoor AI Helper

Tablin Give the elderly a good day (2022)

'사이드 테이블' 컨셉의 AI 노인 케어 로봇

Tablin은 침대나 소파 등 휴식 공간에서 사이드 테이블로 사용할 수 있는 'AI 노인 케어 로봇'입니다.

Tablin is an 'AI elderly care robot' that can be used as a side table in rest areas such as beds and sofas.

AI Wheels

AI Furniture

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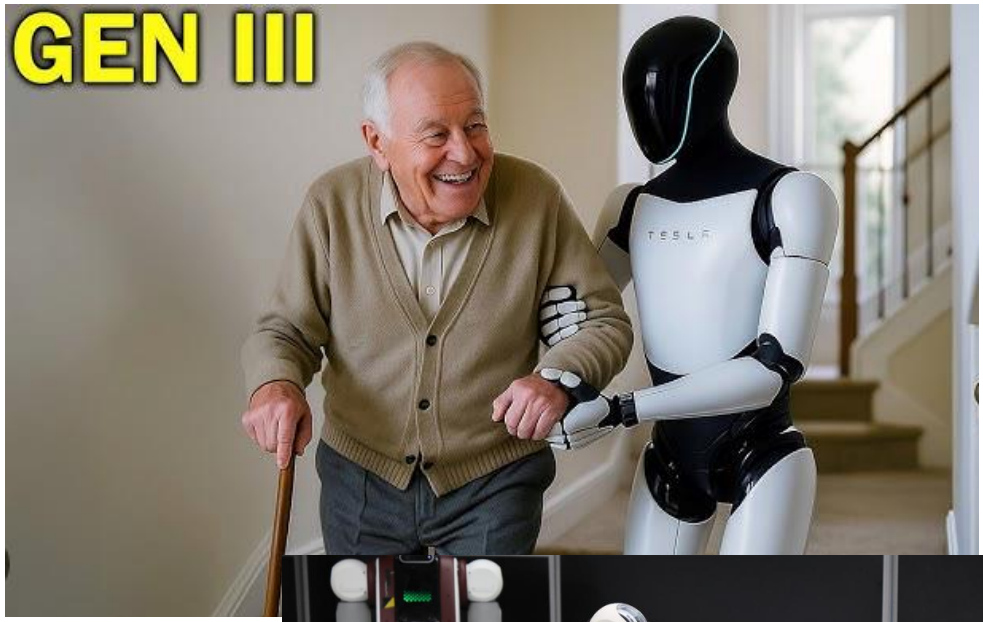
Tesla Optimus Gen 3



DexRobot MiniMore

RoboticX The FIVE

AI Today

- Smarter, multimodal (language + vision)
- Moving into physical form (robots, assistive devices)

Home Care Opportunities

- Personalized routines & reminders
- Safety monitoring & alerts
- Companionship & conversation
- Physical support (mobility, daily tasks)

Challenges and Outlook

- Trust, privacy & dignity must be safeguarded
- Cost & access remain key barriers
- Goal: AI as empathetic partners supporting caregiverss

“

01

Where We Are and Where We Are Heading ?

The Fourth Industrial Revolution

1st Industrial Revolution
Steam

1700s

2nd Industrial Revolution
Electricity

1800s

3rd Industrial Revolution
Computing

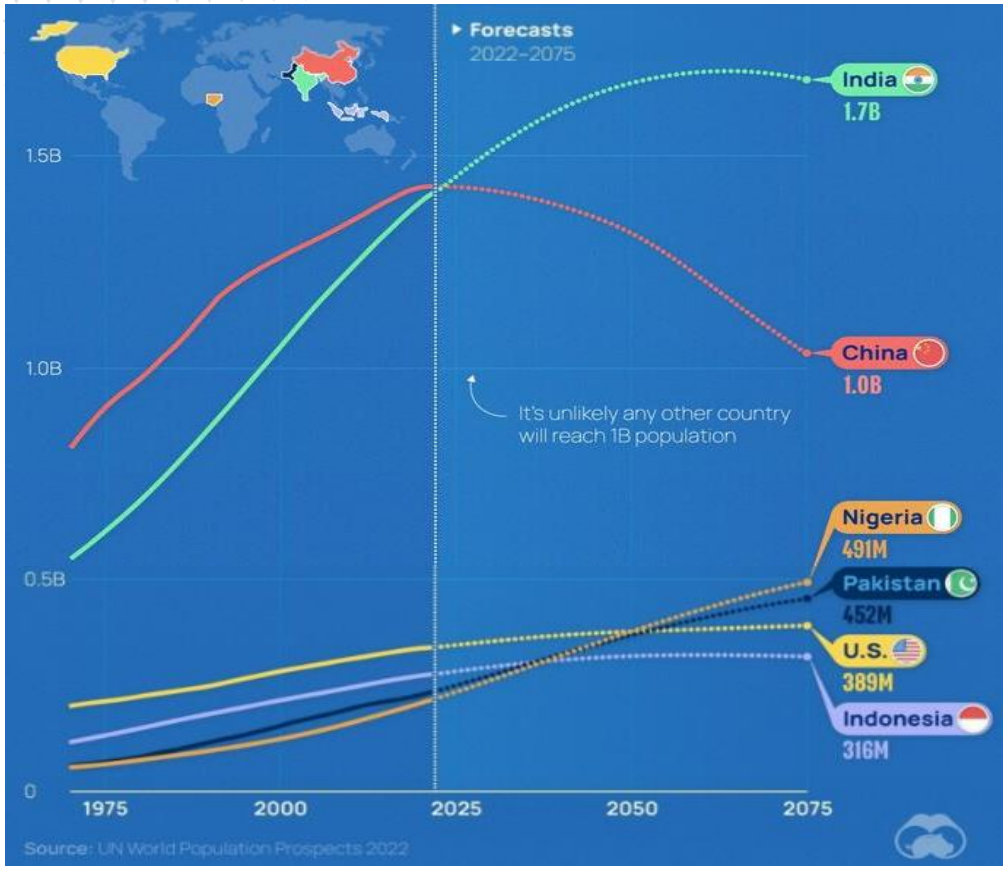
1990s

Artificial Intelligence
3D Printing
Biotech
Robotics
Autonomous vehicles
Nanotechnology
Quantum Computing
IoT

4th Industrial Revolution
Intelligence

Today

Embodied AI: Emerging Role in Industries & Home Care



Industrial Assembly

Logistics Sorting

Home & Elder Care

Power Operation

Dexterous manipulation determines the timing of embodied AI can truly come online

02

Why AI is different?

AI is evolving so fast

Deep Blue
Defeats a professional chess grandmaster

1996

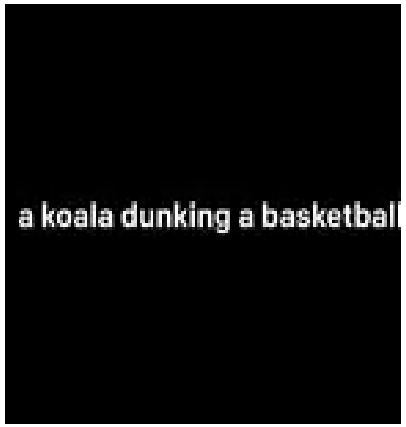
AlphaGo
First to defeat a professional Go player

2016

AlphaFold2
RoseTTAFold
Breakthrough innovations in protein structure prediction and protein design

2020
-2021

Sora
First generative model capable of generating seamless videos over 1 minute



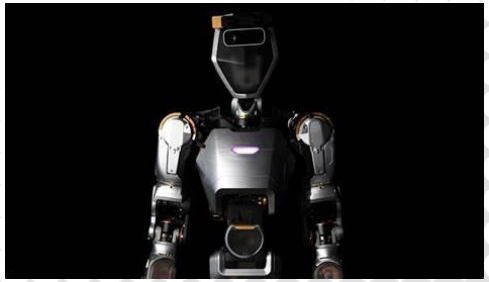
DALLE-2
and Stable Diffusion
Based on diffusion models, image generation applications gain public popularity

2022

ChatGPT
First publicly available GAI dialogue application, reaching hundreds of millions of users in about 2 months

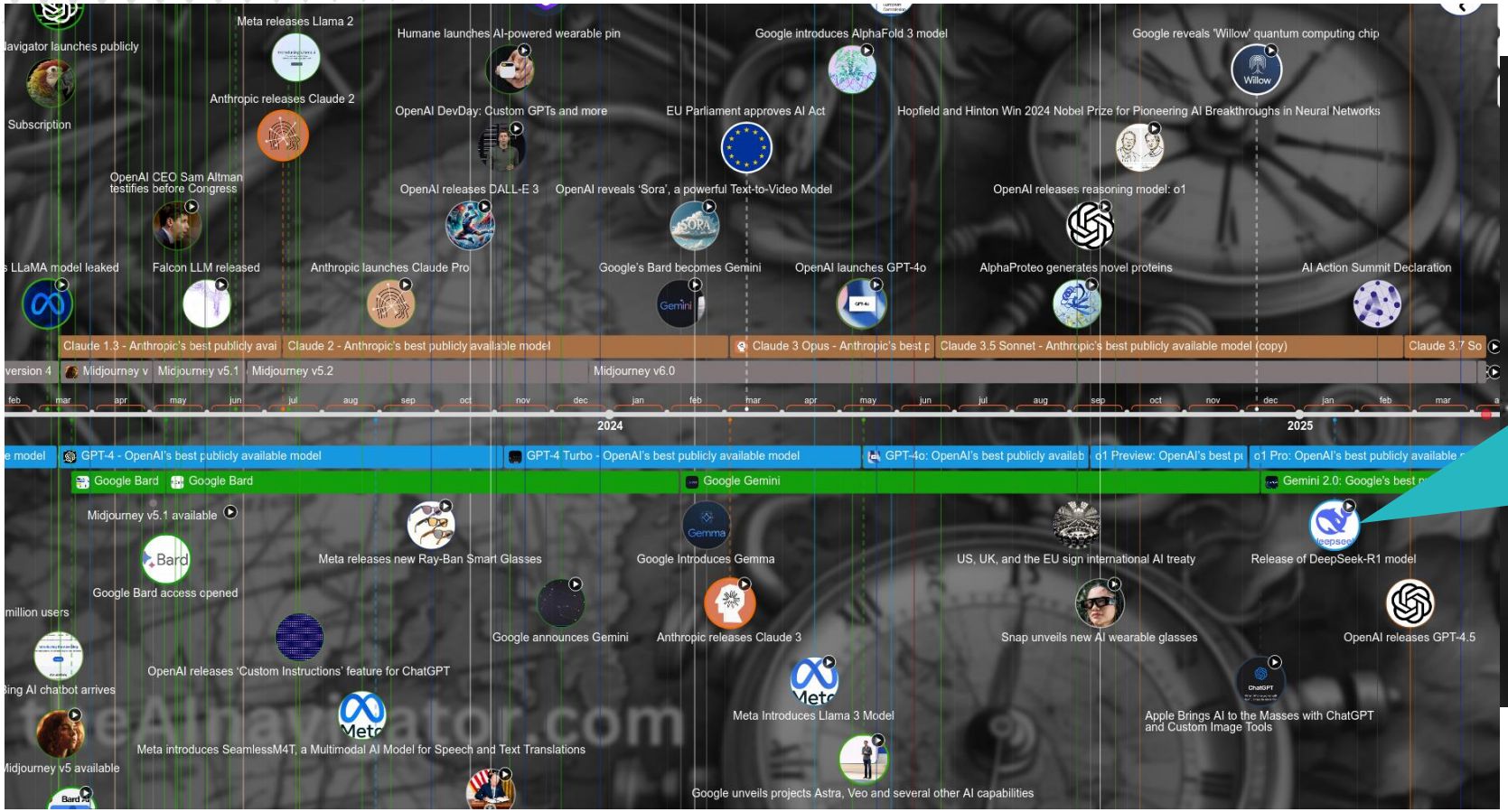
2024

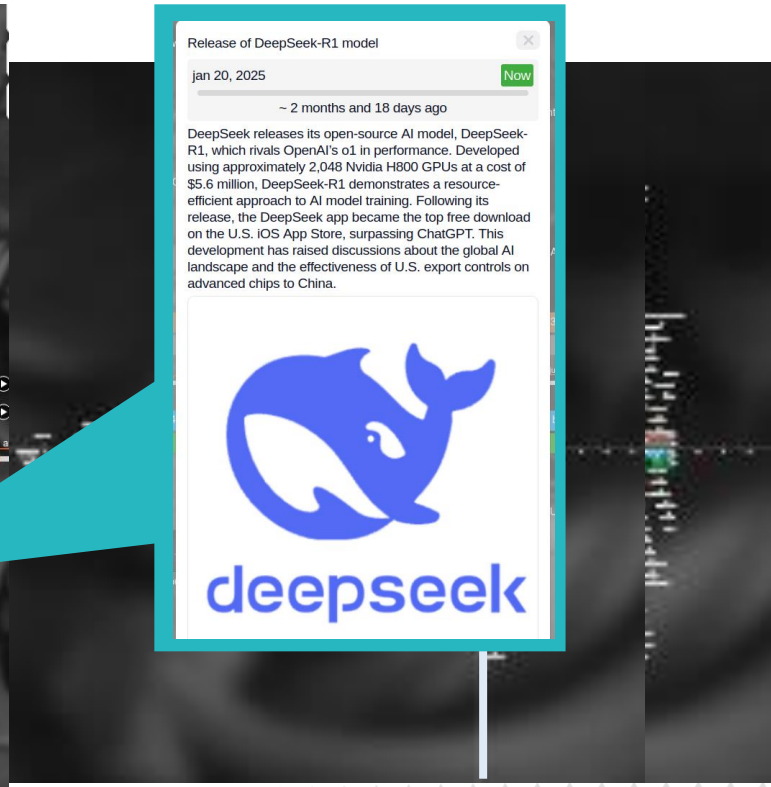
Phoenix
First robot able to complete tasks at human speed



AI is evolving so fast

Has AI Reached the Scaling Ceiling Yet?





June 7, 1950

Alan Turing introduces the concept of the Turing Test

Mar 14, 2023

GPT-4 is publicly available

https://time.graphics/editor/809611

From simple algorithms to multimodal systems

AI has evolved to understand context, and is now learning to understand and interact physically

1950s-1980s

Rule-Based Systems

Early AI focused on prede{ned rules and logical operations

Home Care Relevance

- Basic reminder systems
- Simple scheduling

1990s-2010s

Machine Learning

Systems that learn from data without explicit programming

Home Care Relevance

- Pattern recognition
- Predictive health monitoring

2010s-Present

Natural Language Processing

AI systems that understand and generate human language

Home Care Relevance

- Voice assistants
- Conversational companions

Present-Future

Multimodal Embodied AI

Systems integrating vision, language, and physical interaction

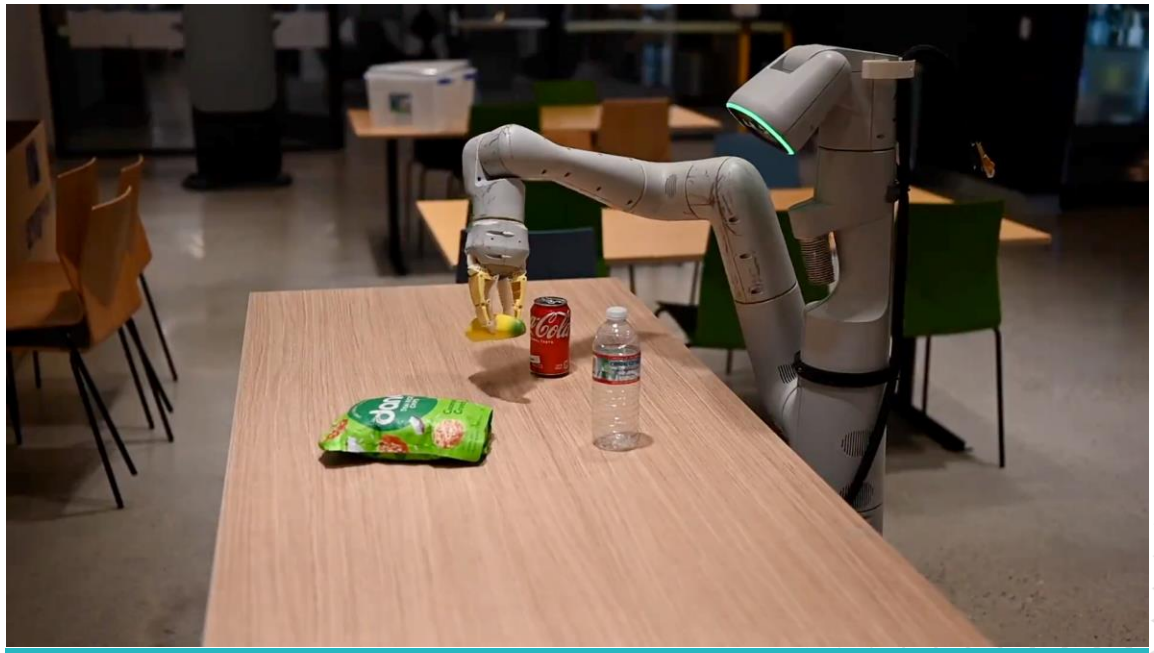
Home Care Relevance

- Contextual understanding
- Real-time routine adapting
- Physical assistance robots

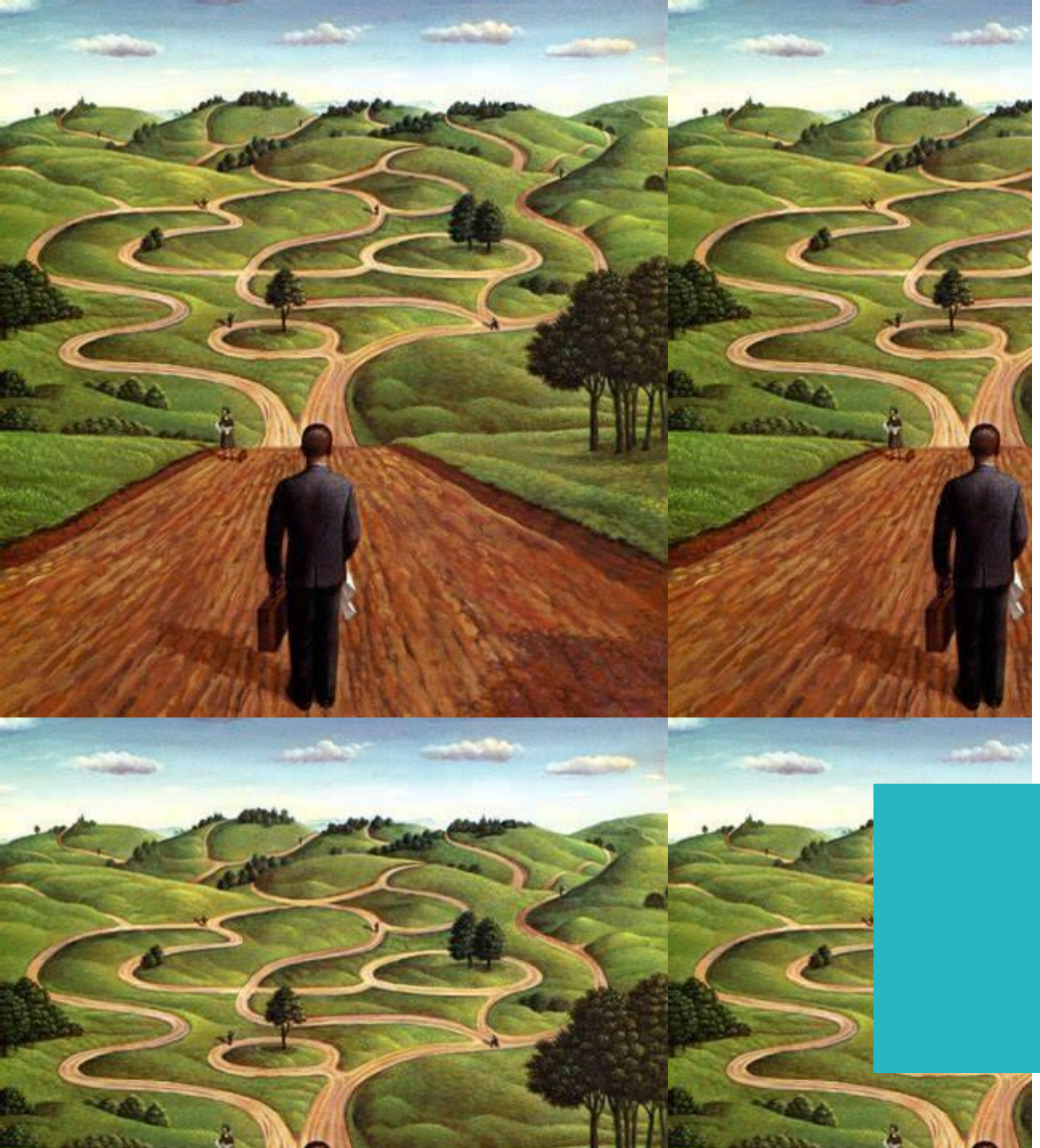
Physically Embodiment

Robots and assistive devices moving beyond screens to interact physically in home environments

Task understanding, reasoning, inferring, action planning



Action Performance

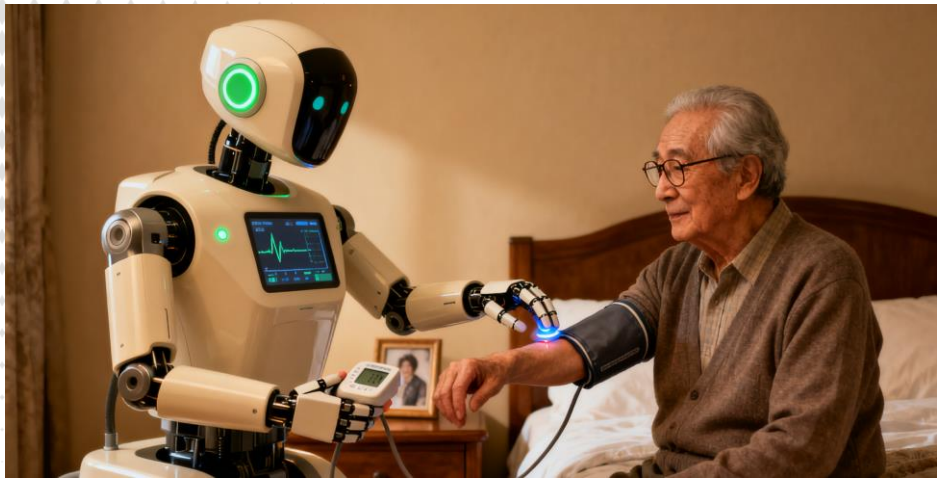


03

Senior Care Opportunities

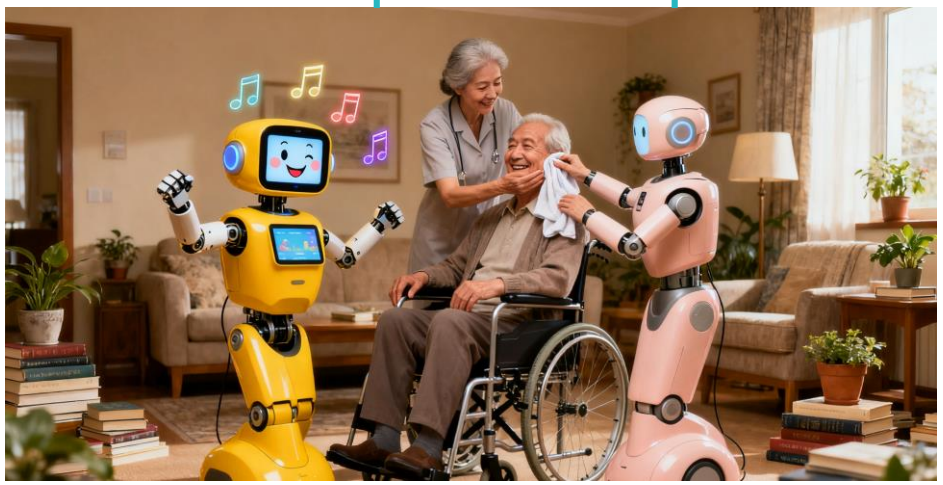
Current Care Robot

Personalized Routines

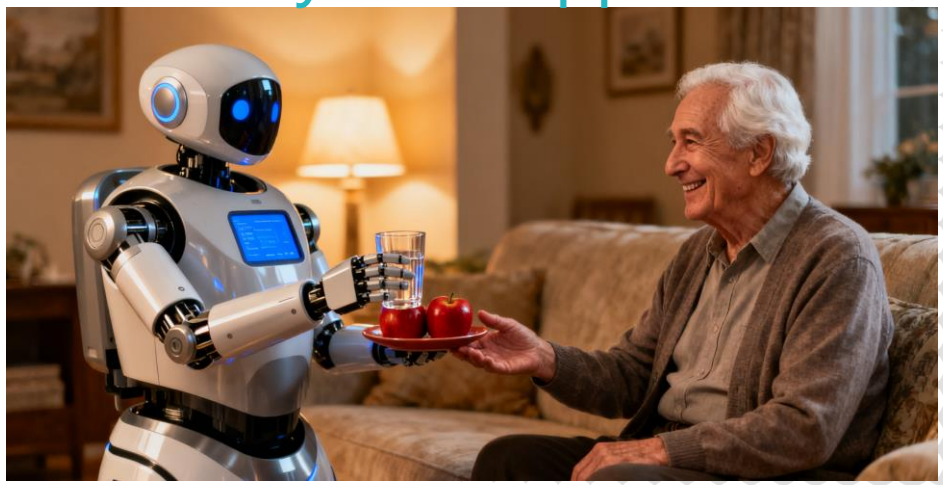


Safety Monitoring

Companionship

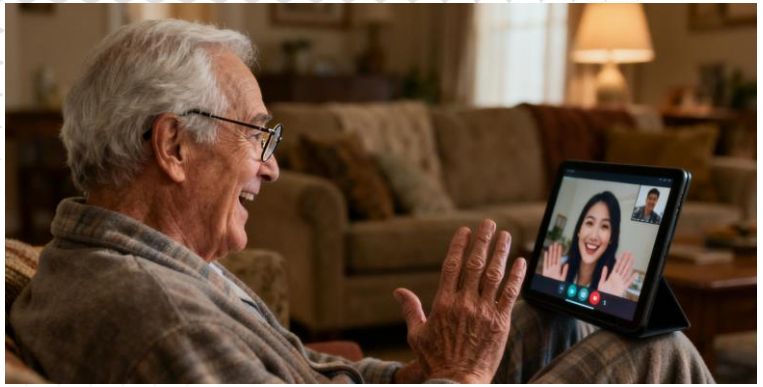


Physical Support



Nowadays AI is more emotionally supportive

Easier Phone/Video call



Nice play!
One more round

Smart Home

Even miao~
can learn to
use it

Better Entertainment

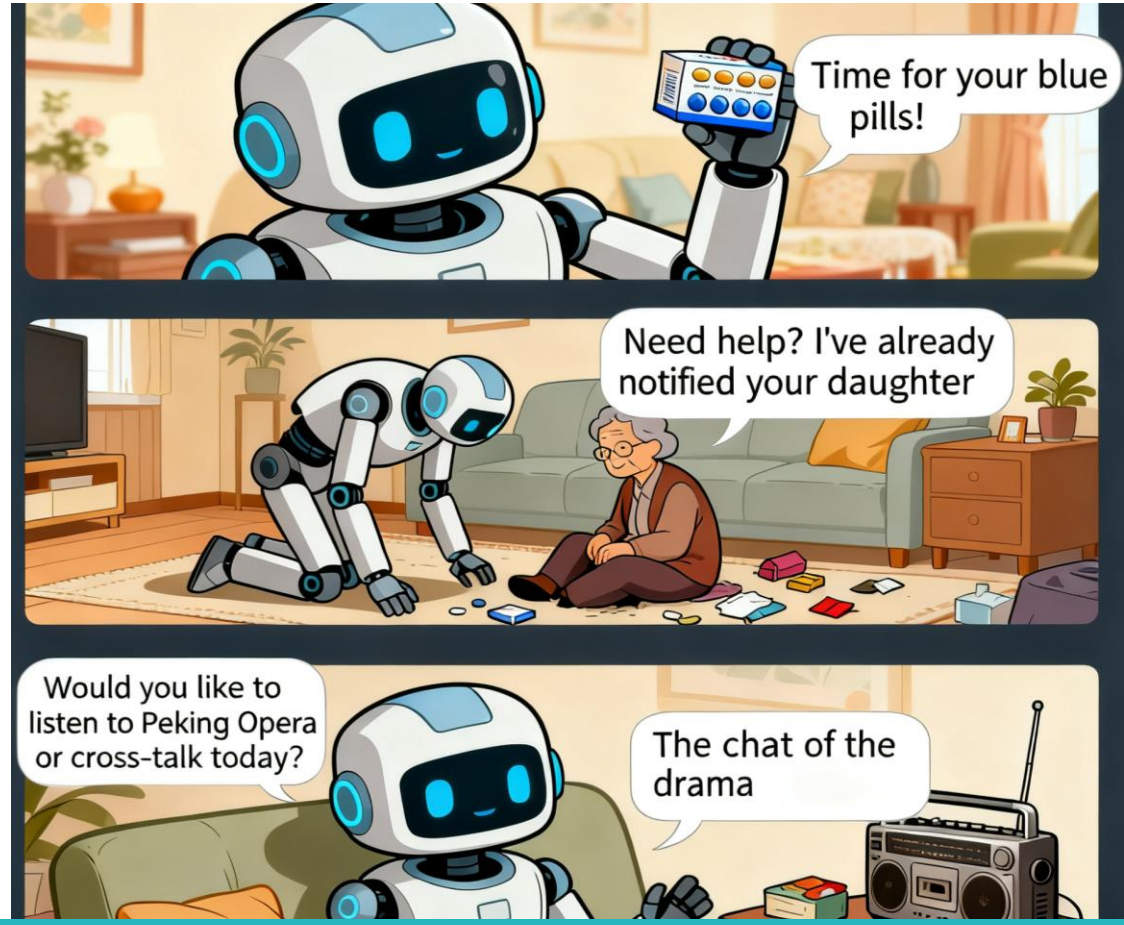
The eggs are
going to go
bad soon!

Evolving From Tools to Friends

Robot

Not just a machine, but a digital companion

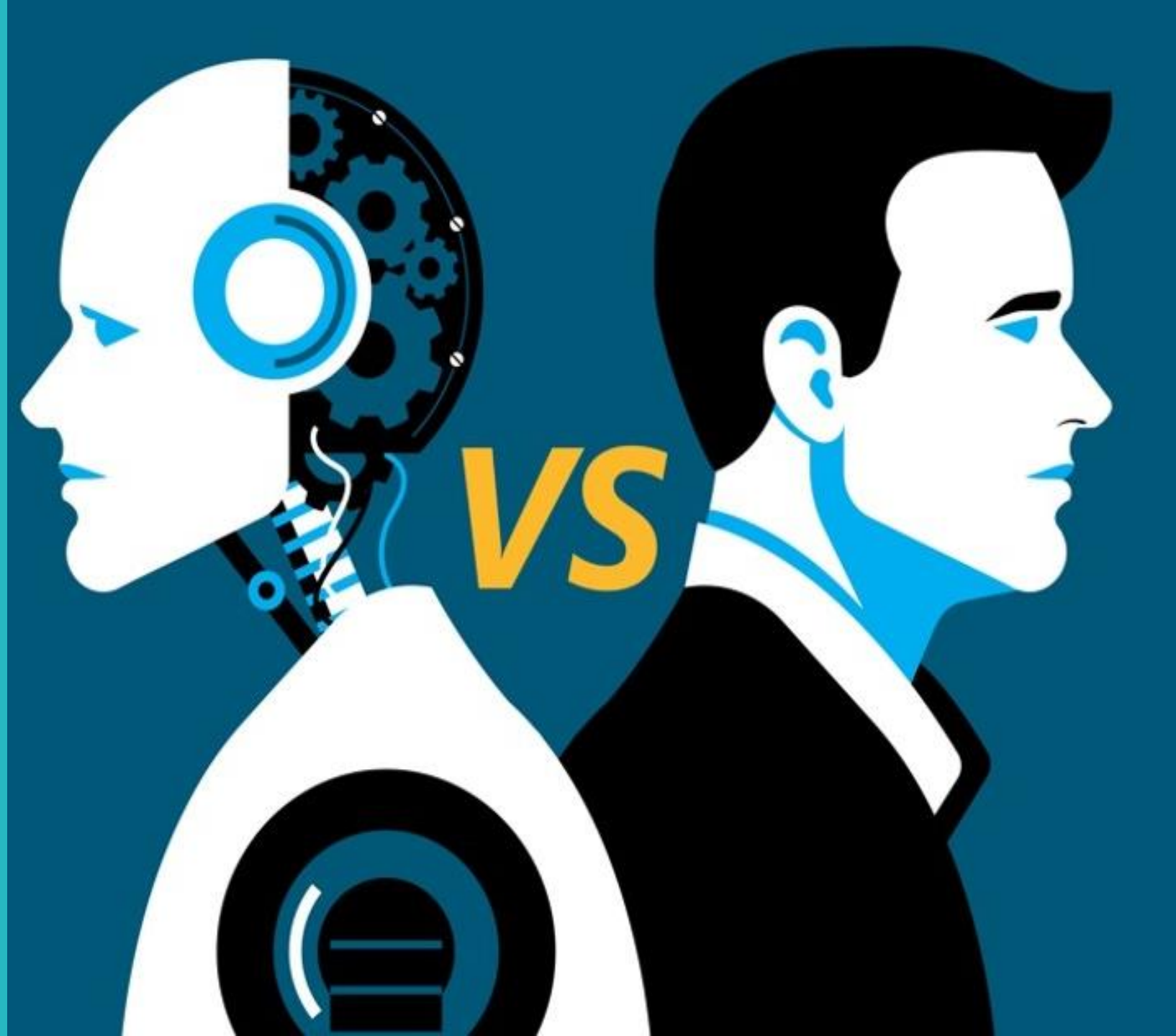
- **Personalized Routines,** such as Medication Reminders
- **Safety Monitoring,** such as Fall Detection & Alert, Vital Signs Monitoring + Emergency SOS Call
- **Companionship,** such as Conversation & Chat
- **Physical Support,** such as playing chess, picking up a delivery



Critical Breakthrough: Tailoring to Individuals

04

Future Considerations



Critical Safeguards

Trust, privacy, and dignity as non-negotiable foundations for AI in home care

Core Principles

Trust

Reliable systems with transparent operations and consistent performance that users can depend on

Privacy

Protection of personal data with strict controls on collection, storage, and usage

Dignity

Respectful interactions that preserve autonomy and avoid infantilization

Data Protection Measures

- Anonymization
- Encryption
- Data Minimization
- Security Protocols
- Retention Limits
- Access Controls

Ethical Frameworks

Human Oversight

Maintaining human decision-making in critical care scenarios

Transparency Reports

Regular updates on data usage and system performance

Ultimate Vision

AI as empathetic partners that augment rather than replace human caregivers

Human-AI Collaboration Models

Complementary Roles

AI handles routine tasks and monitoring, freeing caregivers for emotional support and complex decision-making

Continuous Feedback Loop

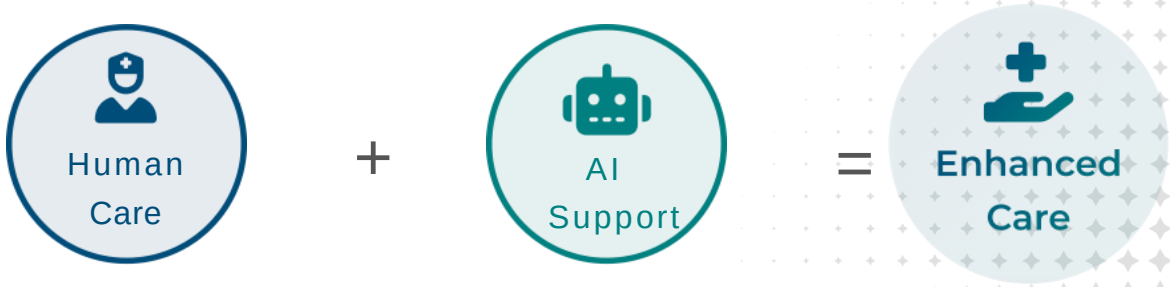
AI learns from caregiver expertise while providing data-driven insights to improve care quality

Team-Based Approach

Care recipients, family members, professional caregivers, and AI

★ Complementary Strengths

Human Empathy	AI Consistency
Human Intuition	AI Data Processing
Human Touch	AI Availability



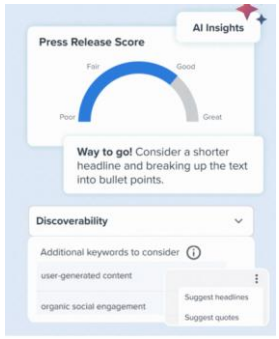
Path

Data & Service

Personalized

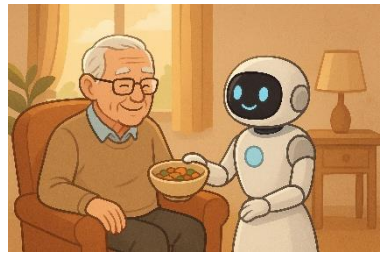
Non-Personal

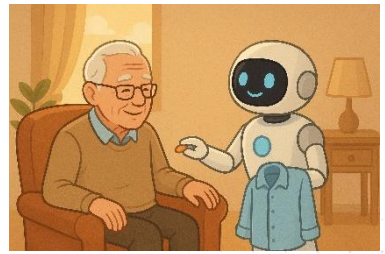
Adaptive rehab robots, tailored monitoring systems…



Bathing machines, lifting robots, standard rehabilitation robots
…

Nutritional meal prep, medicine delivery, emotional support companions





Simple home assistants, cleaning robots, basic reminders
…

Professional

Home

Facility Type

产品参数

DexRobot 灵巧智能

标准配置：

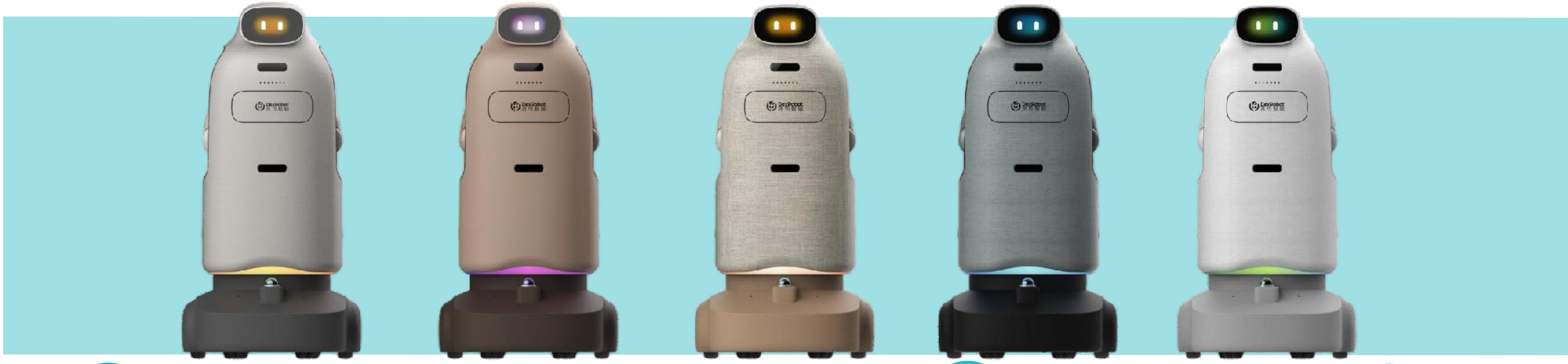
配置项	数量
主控Jetson AGX Orin	1
机械臂	2
双目视觉 D435i	2
交互显示屏	1
三指灵巧手 DexHand021 S	2
3D激光雷达	1
移动底盘	1

整机参数：

类别	参数
外形尺寸	610mm*550mm*1090mm
整机重量	55kg
主控	英伟达（NVIDIA）Jetson AGX Orin 64G+1T固态硬盘
磷酸铁锂电池	48V 20Ah

小默机器人

DexRobot 灵巧智能



机械臂

6自由度机械臂
实现高动态运动能力

灵巧手/夹爪

DexHand021 / 021 S
实现手部灵巧操作能力

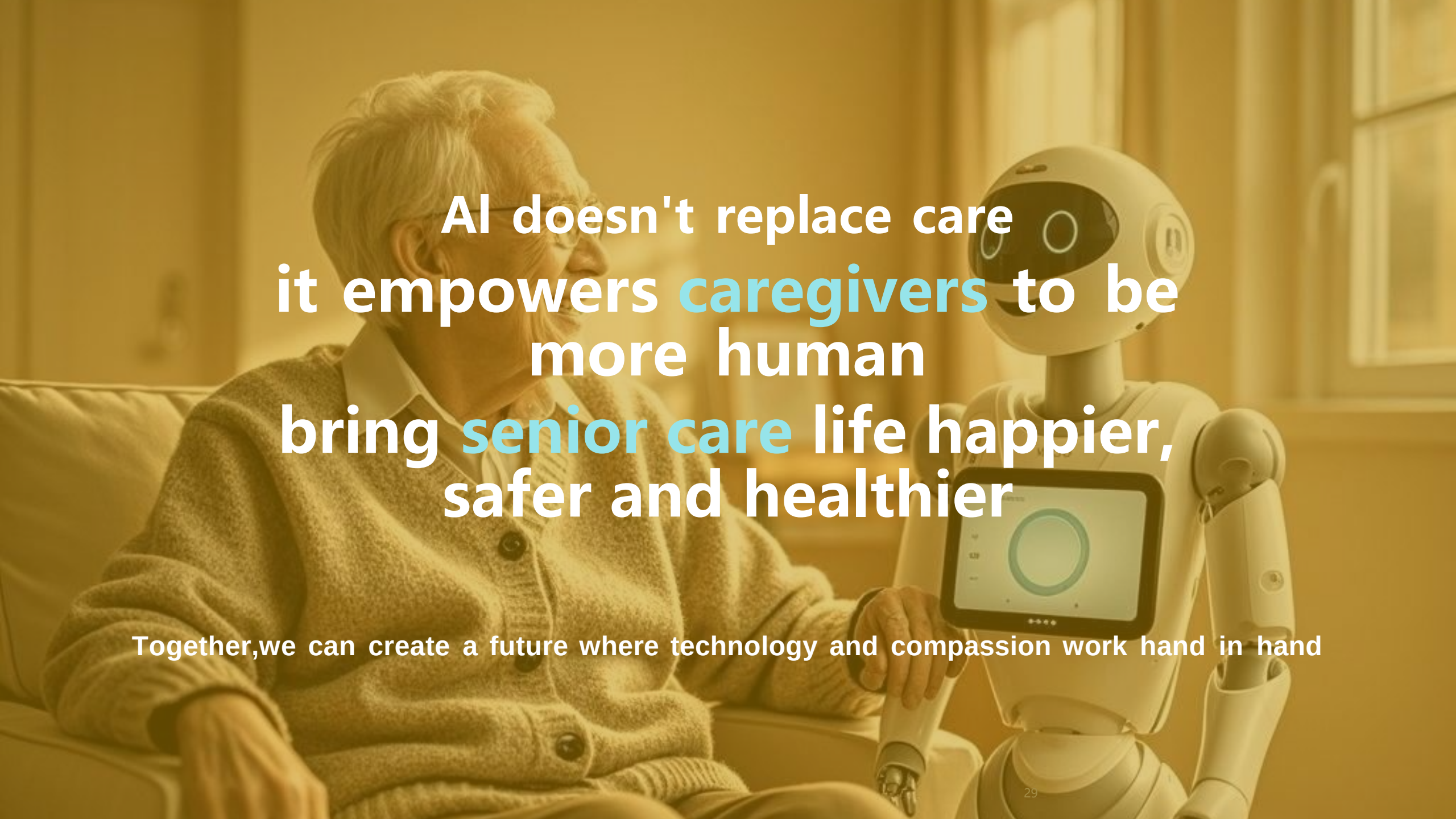
移动底盘

轮式底盘
实现机器人移动能力

语音模块

NLP 自然语言对话
实现机器人交互能力

一款兼备运动能力/操作能力/移动能力/交互能力的复合机器人


AI doesn't replace care
it empowers caregivers to be more human
bring senior care life happier, safer and healthier
Together,we can create a future where technology and compassion work hand in hand