# Was kann Robotik im Alter für mich tun?

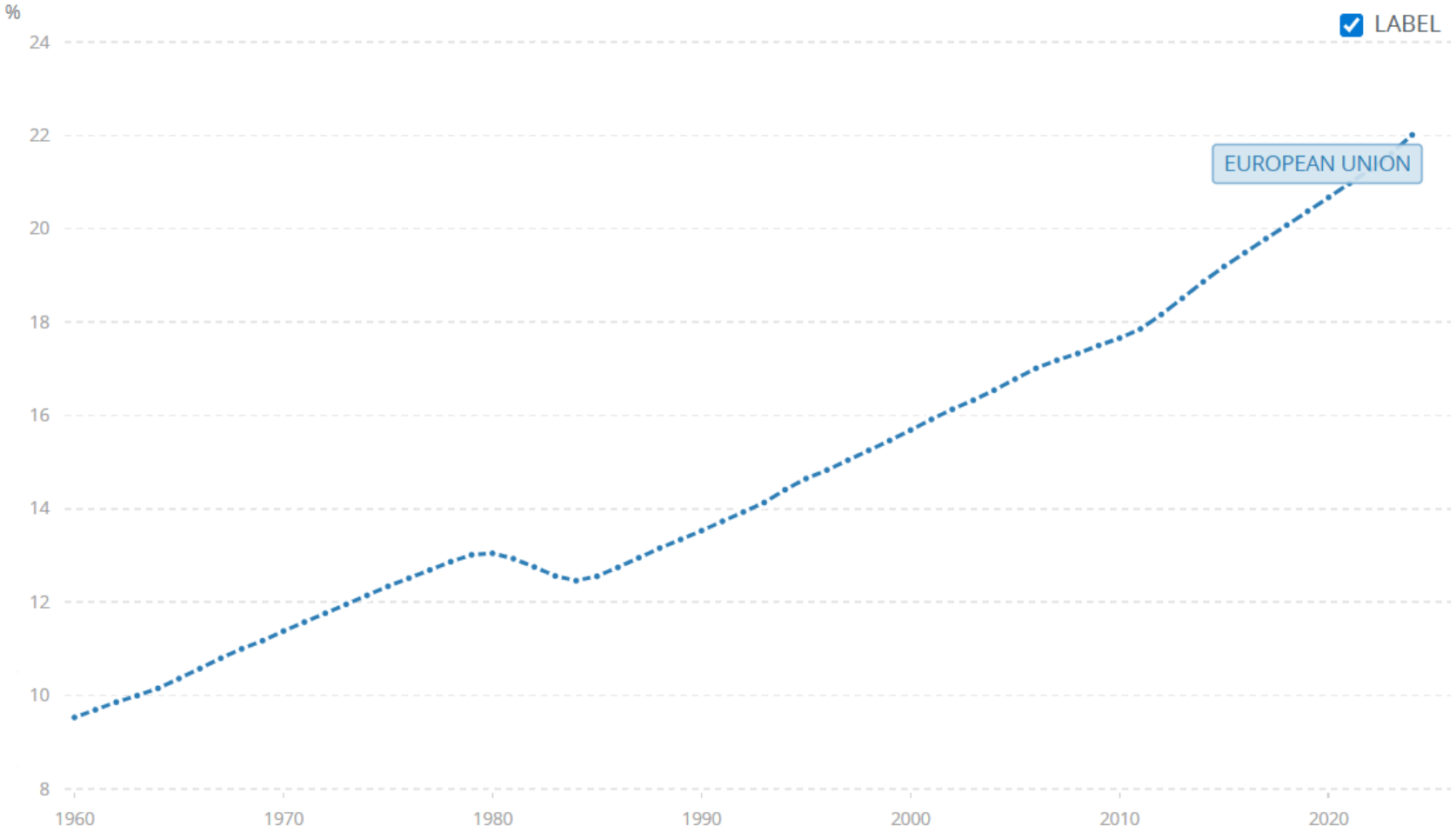
**09/06/2026**

Angelika Peer

*Die Zukunft des Älterwerdens*

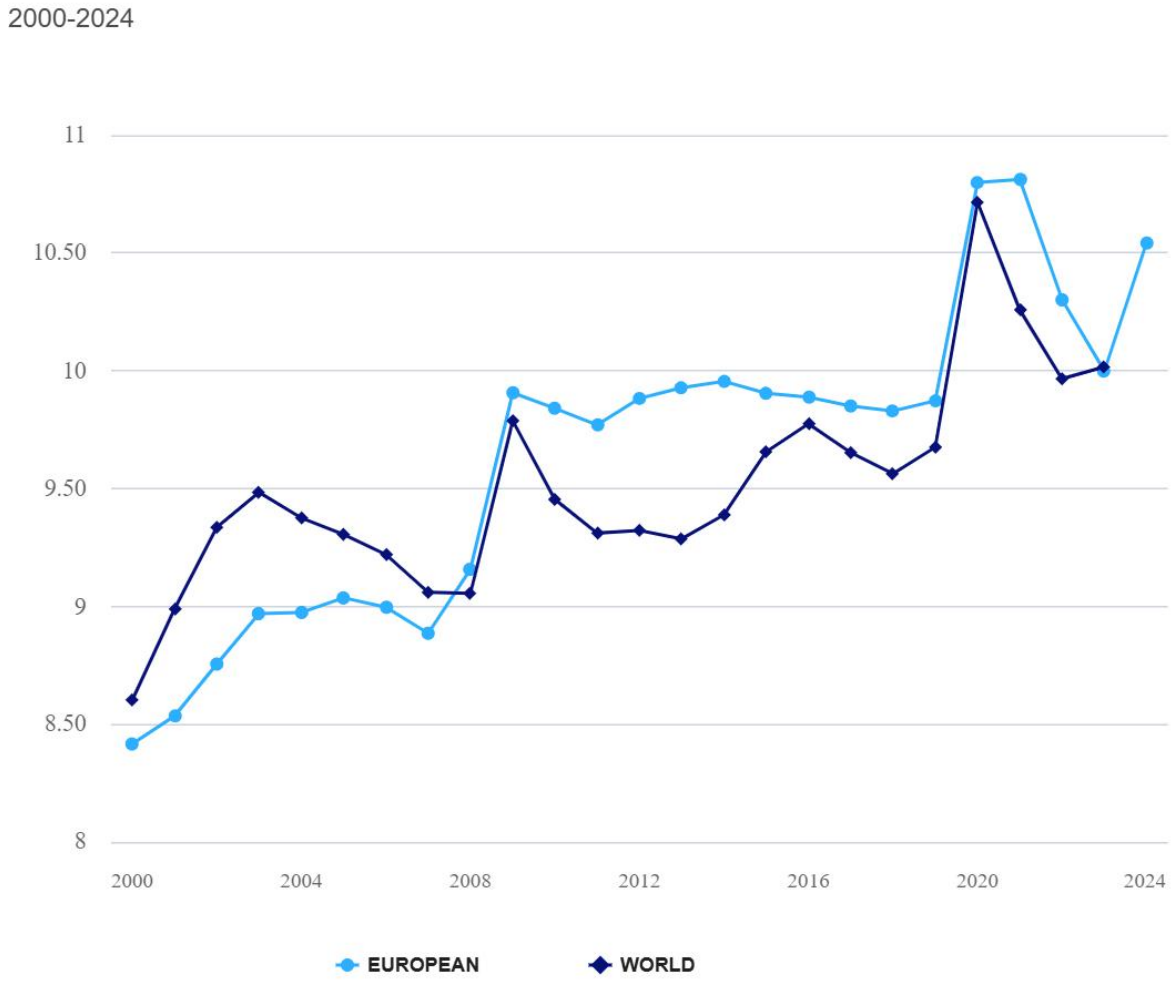

# An Ageing Society

**Population ages 65 and above (% of total population) - European Union**




[Source: World Bank Group]

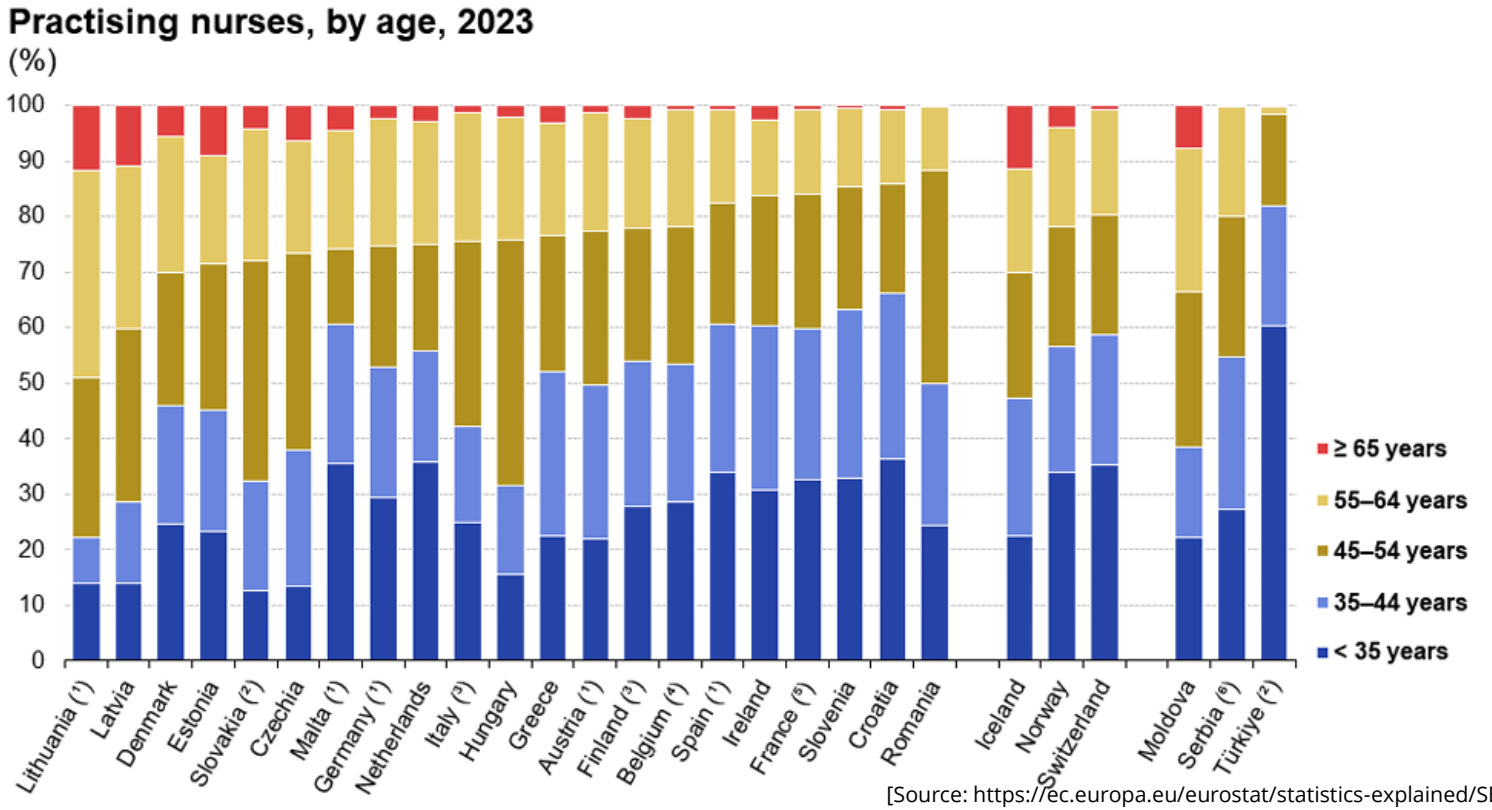
# Increased Health Expenditure (% of GDP)




[Source: Global Health Expenditure Database, updated December 12th, 2025, World Health Organization (WHO)]

# Shortage Medical and Social Care workers

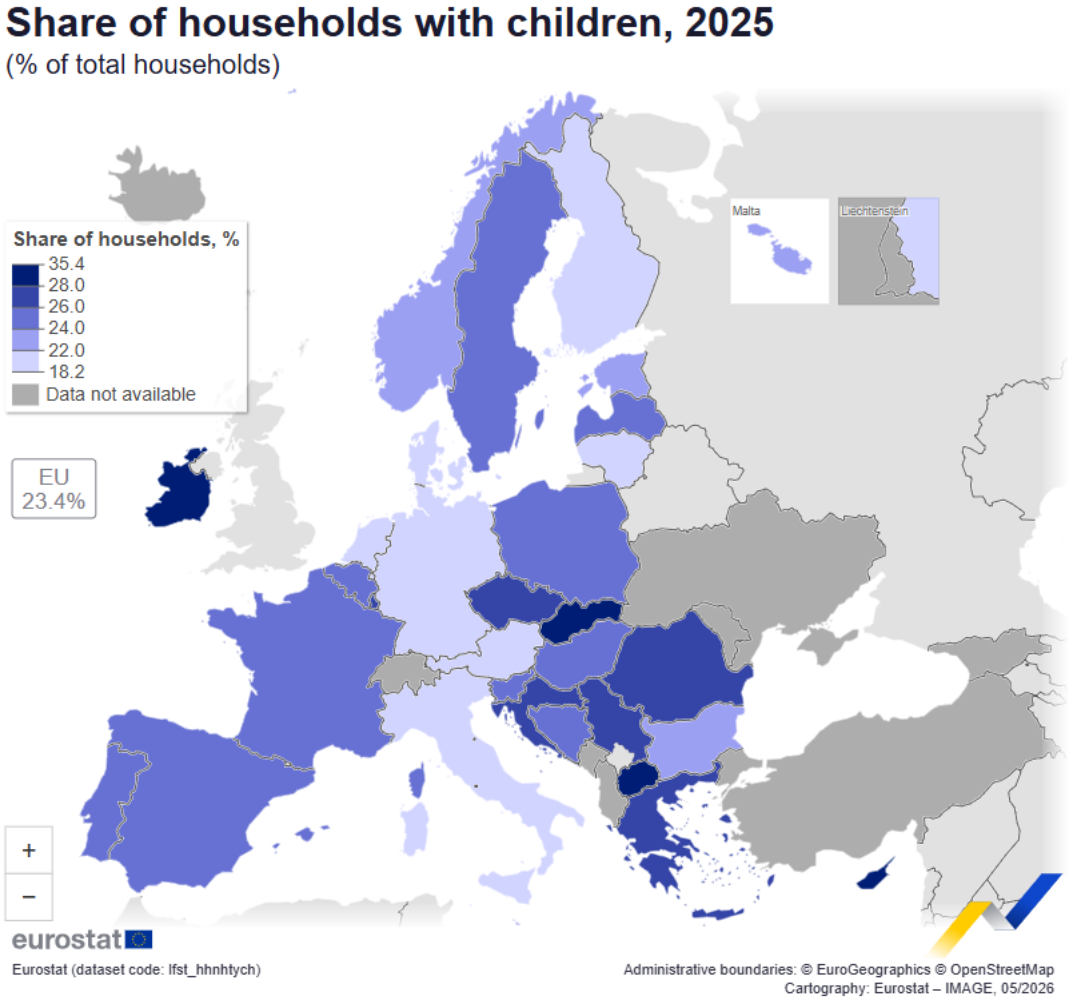
- WHO estimates a projected shortfall of 11 million health workers by 2030, mostly in low- and lower-middle income countries [WHO 2026]




[Source: https://ec.europa.eu/eurostat/statistics-explained/SEPDF/cache/37383.pdf]

# Changing family structures

- Percentage of elderly people living alone is rapidly increasing
- In 2025, 203 million households resided in the EU, of which over 76 million were single adults without children



# How can robotics help me in my old age?

# Telepresence and remote care

# Telepresence and remote care robots

- Mobile telepresence robots for maintaining family and social connections
- Video consultations with doctors

[Awabot One]

# Medication Robots

# Medication Robots

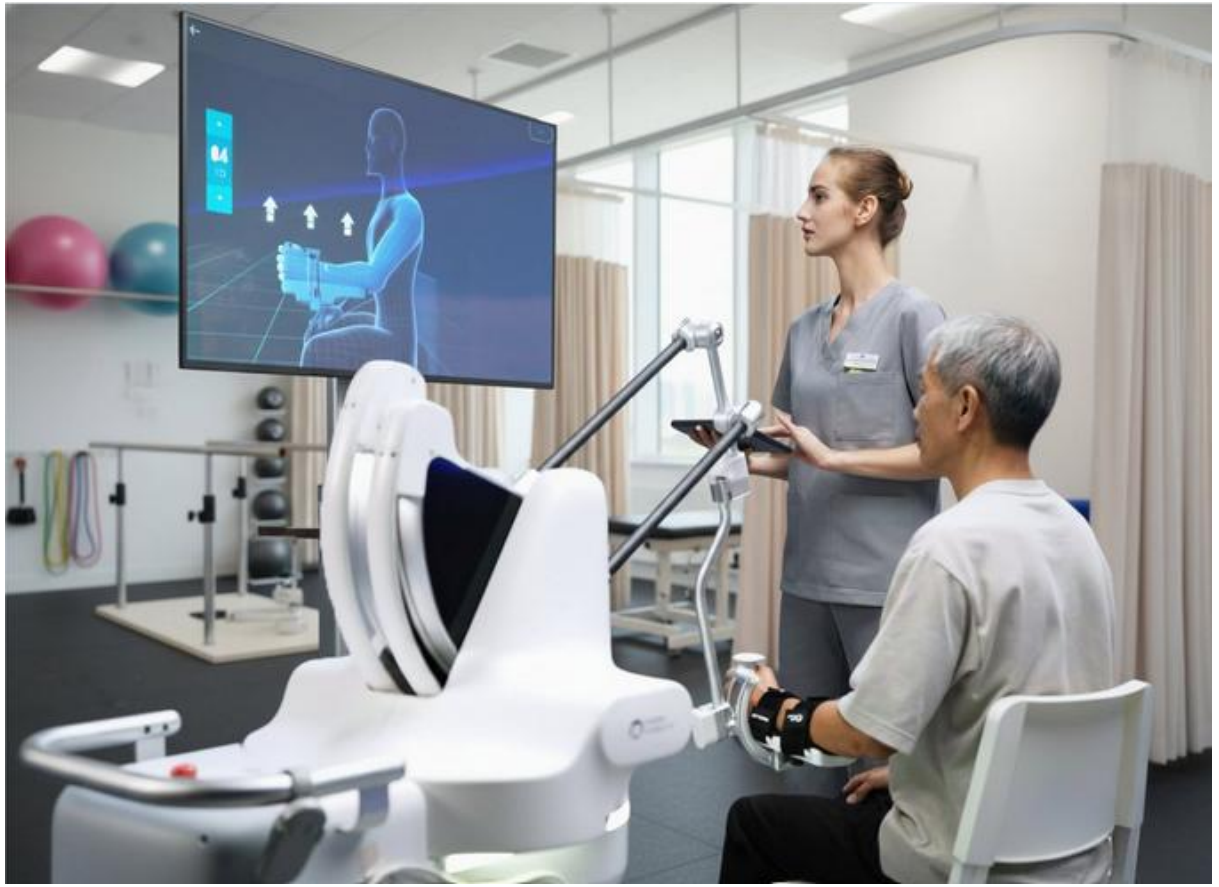
- Medication robot leverages cameras and an AI algorithm to monitor medication-taking
- Pops out an automatic alert if the meds are not taken properly
- Helpful for seniors who have serious medical conditions; difficulties with vision, dexterity, or cognition; or memory lapses.

[Source: https://www.heymisa.com/health-and-safety/]

# Rehabilitation robots

# Rehabilitation Robots

- Stroke patient during robot-aided therapy



[Source: Fourier Rehab]

# Mobility Assistance Robots

# Sit-to-Stand Transfer Robots

M. Geravand, P. Z. Korondi, C. Werner, K. Hauer, and A. Peer, “Human sit-to-stand transfer modelling towards intuitive and biologically-inspired robot assistance,” Autonomous Robots, vol. 41, no. 3, pp. 575–592, 2017.

# Robotic Walkers

- Sensorial assistance
- Cognitive assistance
- Physical assistance

# Wearable exoskeletons

- **Exoskeletons** are wearable robotic systems that support or augment movement
- **Gait assistance** is a key application of lower-limb exoskeletons for walking support

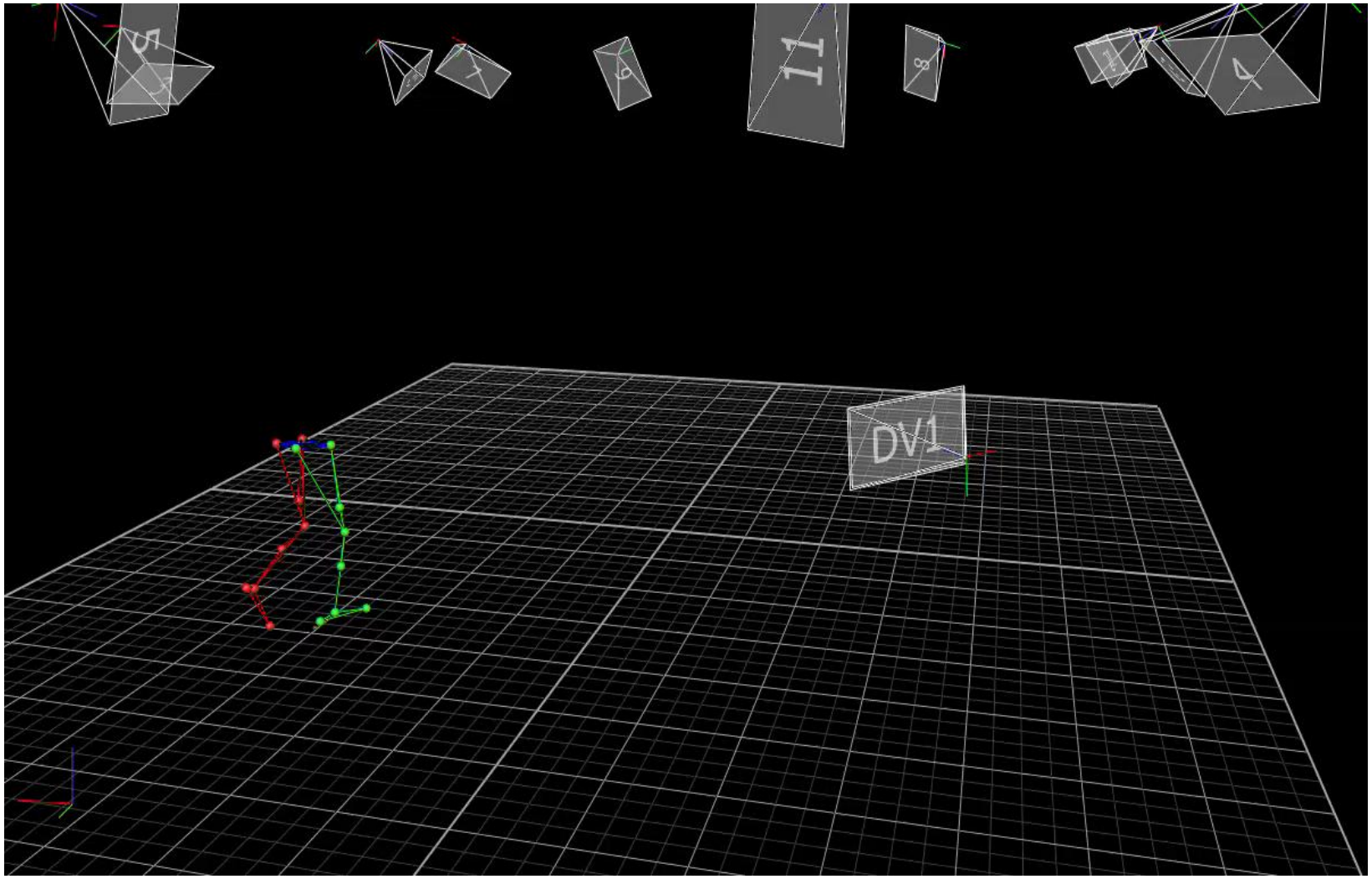
Vicon Nexus
Motion Capture

Delsys IMU
Sensors

Argus Eye
Tracking System

Intel D435i Depth
Sensor Camera

Reh4Mat Hip
Orthosis



# Walking Cane

- Intelligent walking cane that scans the surrounding to guide and navigate user safely
- Tracks user’s gate and balance while monitoring mobility problems
- Provides extra thrust to assist standing up
- Detects sudden movements like falls and alerts social service/family

[Source: Stride Senze]

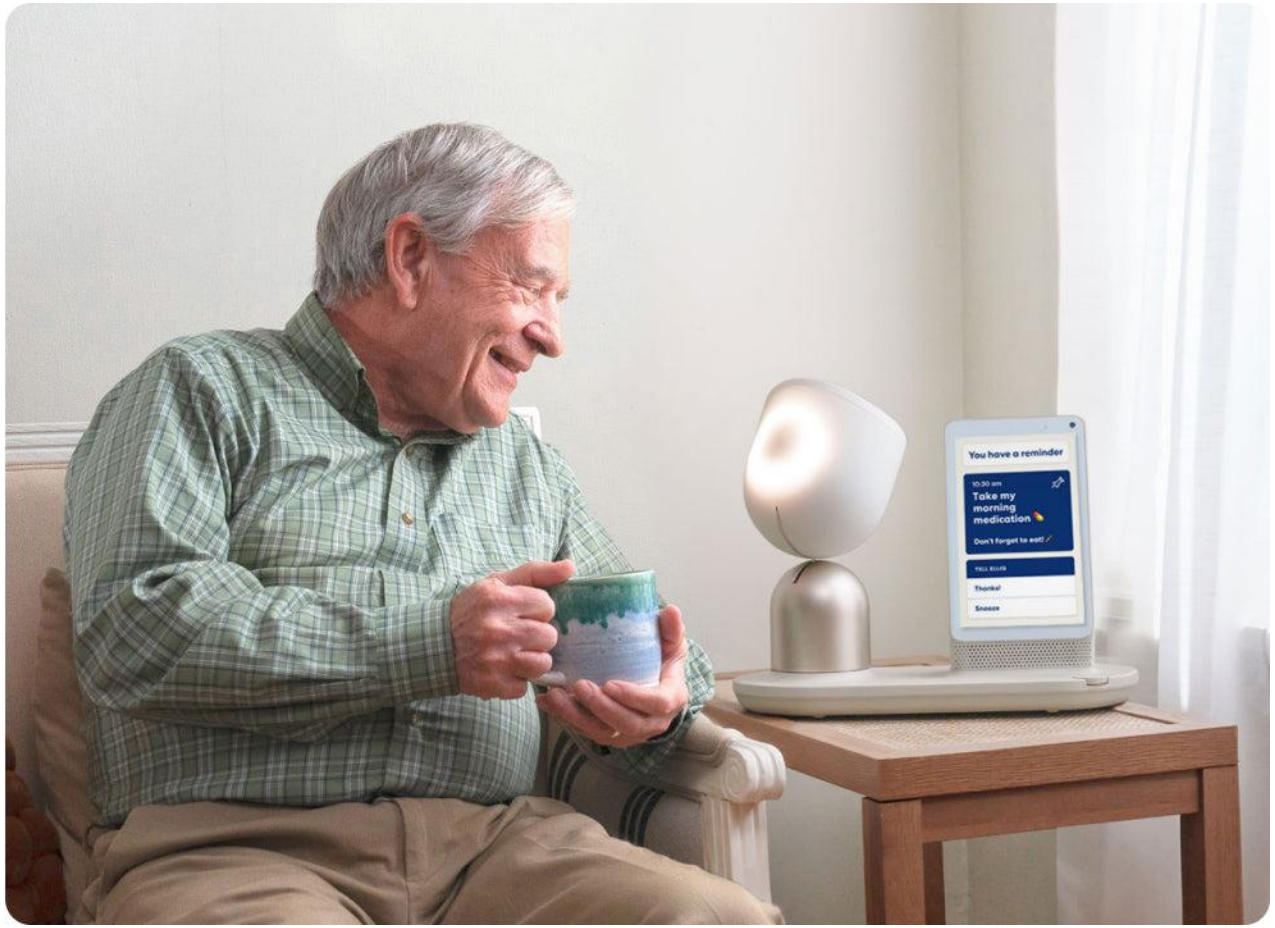
# Companion and social robots

# Companion and Social Robots

- Interactive robots for animal therapy
- In environments where live animals present treatment or logistical difficulties

# Companion and Social Robots

- Quality time
- Connecting with loved ones and new friends
- Health and wellness




[ElliQ]

# Companion and Social Robots

- Robot for performing exercises

# Companion and Social Robots

- Fetch and carry tasks
- Entertainment and communication
- Emergency support

[Source: https://www.care-o-bot.de/en/care-o-bot-3/application.html]

# Companion and Social Robots

- Communication agent
- Telepresence and social link
- Support for caregivers
- Health monitoring

[Source: https://m.bluefrogrobotics.com/elders/]

# Safety and Monitoring

# Safety and Monitoring

- Integrated care systems




[Source: https://www.ubtrobot.com]

# Personal Care Assistant Robots

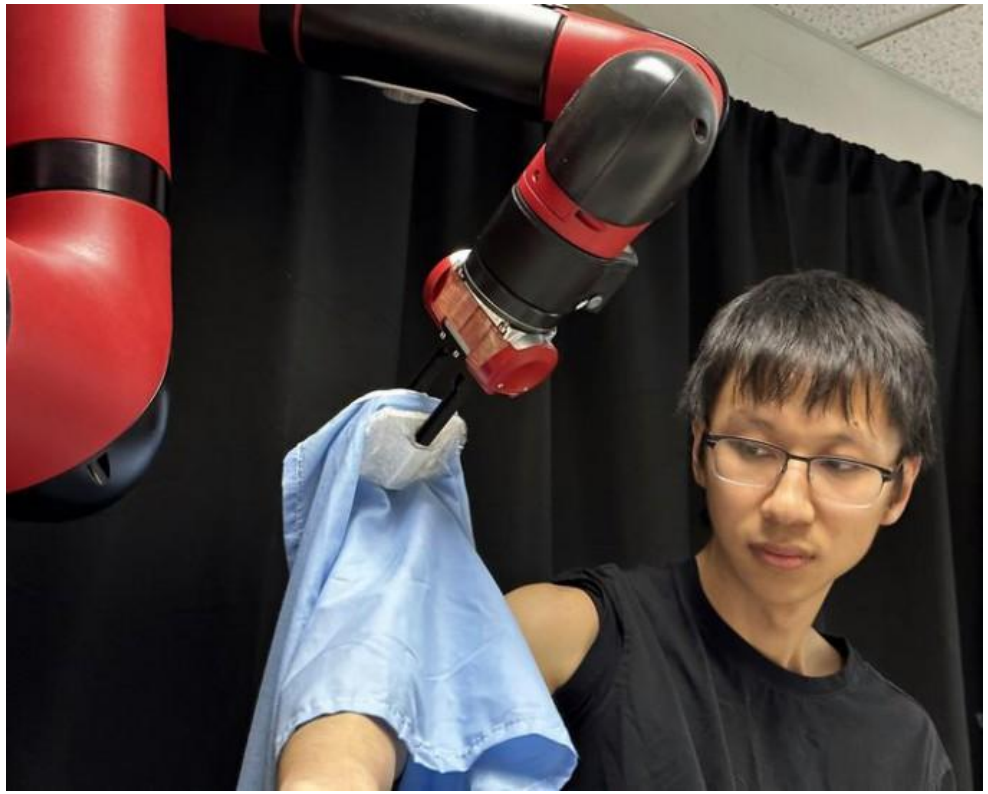
# Motorized wheelchair shower

- Robotic shower hose dedicated to the provision of pouring water, soaping, etc.
- Robotic washer engaged in the provision of washing, cleaning and drying.

[Source: https://robotnik.eu/projects/i-support/]

# Dressing robots

- Robot learns from human demonstrations to perform delicate tasks like pulling sleeves, lifting arms, and sliding on clothing safely and comfortably

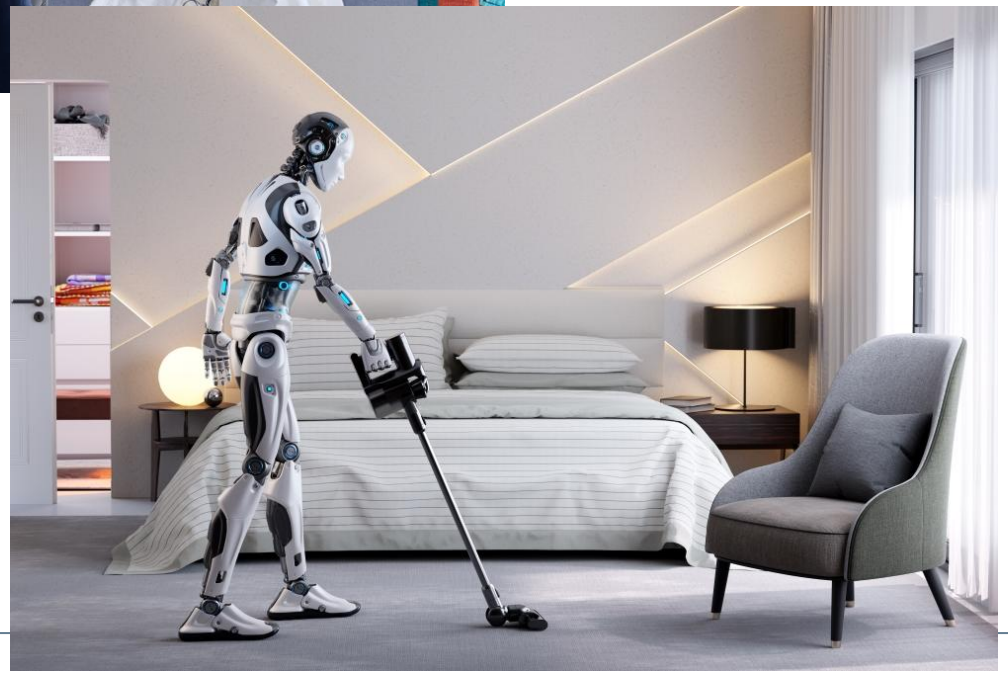


[Source: Carnegie Mellon University's Robotics Institute]

# Household Robots

# Household Robots

[Source: https://www.1x.tech/discover/neo-home-robot]



[Sources: GettyImages-1924607771 [iLexx via GettyImage]

[Source: https://www.electrolux.com]

- Cleaning home
- Preparing meals
- …

and more to come …

# Human-centered Technologies and Machine Intelligence Lab

**Mission:**

Research on the ***next generation of embodied artificial intelligence with and without humans in the loop***, supposed to be not only intelligent, but also trustworthy and ethical

**Embodied artificial intelligence:**

- enables to take intelligent decisions based on sensory information and context
- translates them into actions by means of a physical body


VICON
TIAGO

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