Robotic care in Japan

Notes from a research visit to AIST, Tokyo 11.6.-6.7.2018

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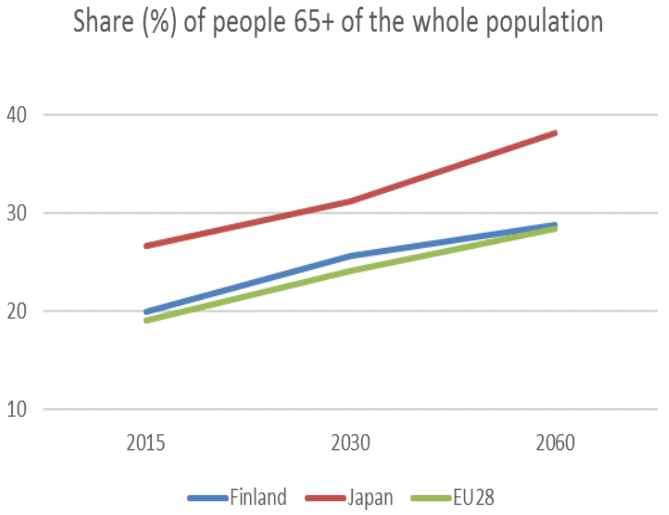
Why Japan wants robotic care?

- Japan is a super-ageing nation
  - The 2025 problem: baby boom generations reach 75+ age
  - Already now 23% of 65+ people live alone
- Estimated shortage of 300 000+ caregivers by 2025
  - Need to increase efficiency and ergonomics of care
  - Need to easen the burden of family caregivers
  - Immigration is found challenging due to language and culture
- To a lesser degree: Tokyo Olympics 2020
  - Lack of service workers
  - A chance to show robotic mastership to the world
- New business opportunities to technology companies

Japan has no discourse of ”robots taking jobs”, common in Europe.



Robotic Care program

http://robotcare.jp/?lang=en

- A national program ”Robotic Care Equipment Development and Introduction Project” 2013-2018
  - Ministry of Economy, Trade and Industry (METI)
  - Japan Agency for Medical Research and Development (AMED)
- To decrease physical burden and increase efficiency of care work, and support participation, activity and independent life of elderly people
- To assist and promote the development and commercialization of care robotics by technology companies in certain 8+5 categories
- In parallel: a subsidy program (2016-) to obtain robotic devices for care: financially supporting care service providers in purchasing the devices

The first 8 categories of robotic care product development

Wearable transfer aids

Non-wearable transfer aids

Outdoor mobility aids

Indoor mobility aids

Toileting aids

Bathing aids

Monitoring systems for nursing care homes

Monitoring systems for private homes

Results from Robotic Care program

- 98 products in development; 15 commercialised (see next sl.)
  - Devices sold <100 (HUG transfer assist robot) to tens of thousands (monitoring systems?)
- 3 robotic care products are subsidied from the LTC Insurance
  - E.g. Little Keepace robotic walker
  - Regulation is strict; not all developers were conscious to take it into account from the very beginning → bad design choices
- 100% subsidy for big care facilities → lots of purchasing robots, but are they in use?
  - Manufacturers would like to collect digital use log data – ethically challenging with patient end users
  - Currently different *companion robots* are evaluated to select one robot to be subsidied from insurance; Pepper is one of the evaluated robots

Japan Long-Term Care Insurance

- all aged 40+ contribute by paying a premium; varies according to income
- All aged 65+ can access benefits; 40+ people eligible with limits
- Benefits include institutional, home and community-based services; accessed through a care manager
- All services are subject to a 10% copayment
- Enrollees can choose between care managers as well as service providers

http://japanhpn.org/en/longtermcare/

Development continues with e.g. wearable mobility-aid devices, devices predicting the evacuation timing, devices to support care receivers in the series of motions required for evacuation, devices to support communication with the elderly and devices collecting and accumulating information involving nursing care services

Commercialized Robotic Devices from Robot Care Project

Transfer Assistance

HUG transfer assist robot

Walking Assistance

Little Keepace robotic walker

Toileting Assistance

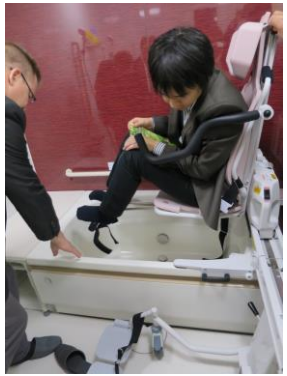
Safety Monitoring

https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxpY3JhMjAxOHdlbGNhcm98Z3g6MzU5ZGUxYTI0MjIyYjYxMQ (Matsumoto 2018)

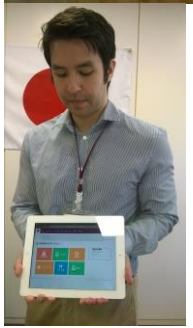
Glimpses of nursing care homes

Small homelike dementia nursing home in Tokyo, 11/2015:
No robots, interested in communication robots and AI solutions

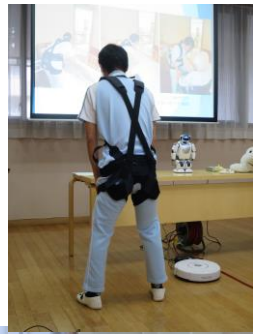
A 95 bed new luxury nursing home in Tokyo, 11/2015:
Robotic bath lifting device



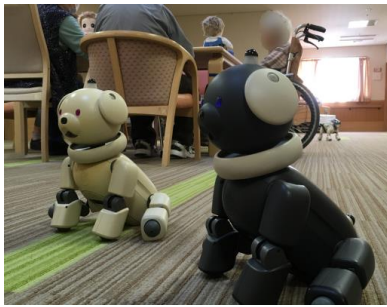
A 140 bed nursing home in Tokyo, 9/2016:
No robots, ”waiting for useful solutions”, lifting devices are of interest. Trialling an iPad application for tracking care activities and digital handover for care workers



Robots in an open site pilot care home in Kanagawa, 11/2017:
Vacuum cleaner, doll robot, communication robot, Paro, two smart walking support devices, lifting support device, bed monitoring device

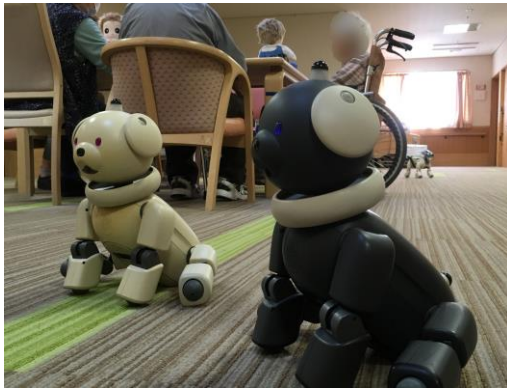


Therapy robots a nursing care home in Tokyo 6/2018:
Healing Toy doll robots, Paros, robot puppies, Aibo robot dogs



Robot therapy session in a care home

- Aim to add communication and alleviate loneliness and quietness
- Scheduled session of 60 min once a month
  1. Touch therapy: cuddling Paros and Healing toys
  2. Physical excercise I: robot puppies wave hands with music, and singing
  3. Ball game with Aibos I: residents throw balls from lap to walking dogs' baskets
  4. Physical excercise II
  5. Ball game with Aibos II
- 10-20 elderly participants with 2 care workers
- Requires 2 robot operators



More information: https://www.tsukuba-g.ac.jp/library/kiyou/2017/03HAMADA.pdf

Why robotisation of care is slow

- Technology reasons
  - Robots are too expensive and unprofitable
  - Robots are too useless or low in usability (take too much time)
  - Safety challenges
  - Incompliance with regulation
- Design reasons
  - Top-down push → robots are not developed for the end-users needs or desires
  - Too little communication between engineers and users; co-design approaches not used enough
  - Service design is missing; no good applications
- Integration reasons
  - Adoption of technology in organisations not supported (e.g., training)
  - Care culture and mindset is based on family care and human touch
  - Only a small number of robotic devices subsidied from insurance; taking new ones in is slow
  - Care managers do not recommend robots due to high price, difficulty in use, lack of knowledge; don't want to receice complaints and change care plans

Background

- I was working 11.6.-6.7.2018 as a visiting researcher at AIST Tokyo (Service Intelligence Research Team, Artificial Intelligence Research Center)
- Background projects:
  - Japan-Finland collaborative project Meaningful Technology for Seniors (METESE)
  - STN project Robots and the Future of Welfare Services (ROSE)

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