

Exploring social implementation of welfare technologies for aging in place

Session 3: Human centered policymaking and care-led innovation

France-Japan Joint Forum « How to cope with ecological and digital transformations – Entrepreneurship and organizational creativity – »

14 November 2023

Amphi Beretz, Nouveau Patio, Université de Strasbourg

School of Social Policy, Social Work and Social Justice
University College Dublin (UCD), National University of Ireland

Naonori Kodate



一般社団法人
UAアーク
Universal Accessibility & Ageing Research Centre



UCD Centre for
**Japanese
Studies**

EHESS Paris
日仏財団

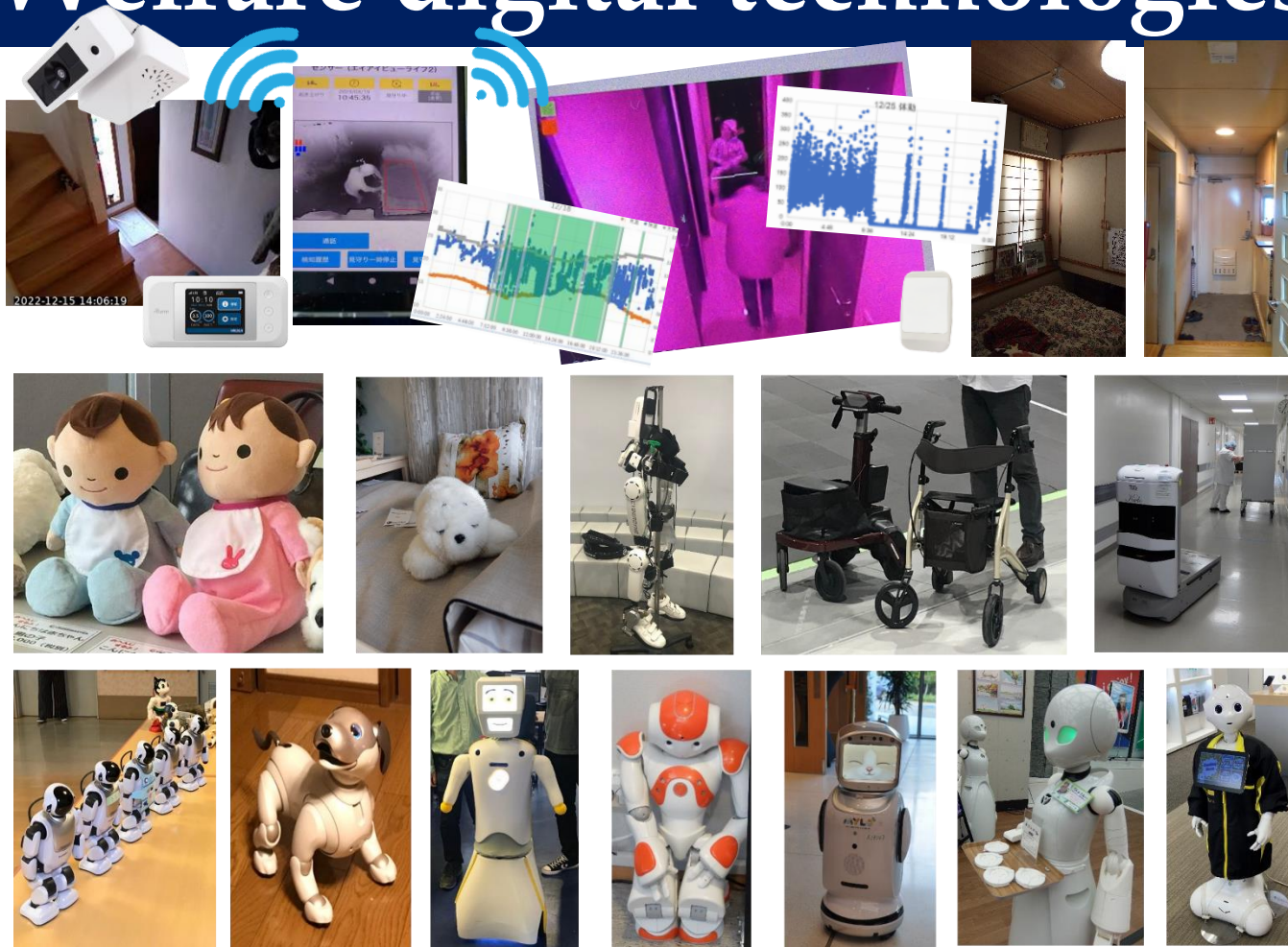
FONDATION
FRANCE-JAPON
DE L'EHESS



Background: Pressures for change

- Rapidly ageing society (demographic structure change):
Very high life expectancy + Declining (and low) birthrate
 - The nuclearization of the family
 - Increasing participation of women in the labor market
 - On the other hand, living at one's private home for as long as one wishes (aging in place) is considered to be the gold standard in industrially advanced economies
 - Aging in place requires highly personalized arrangements and more resources including professional and family support.
- Public policy solutions, including social implementation of welfare technologies, have been sought.

Welfare digital technologies



Assistive technologies (ATs) can provide partial solutions. But how can we go beyond the persistent institutional care delivery paradigm, and are we up to the task of overcoming implementation barriers?

- Kodate, Maeda, Hauray et al. (2022) Hopes and fears regarding care robots: Content analysis of newspapers in East Asia and Western Europe, 2001–2020. *Front. Rehabil. Sci.* 3:1019089. doi: 10.3389/fresc.2022.1019089

This talk

Primarily based on two recently conducted research projects

- Testing the use of an originally developed air-purification robot in nursing homes in Ireland & Japan.
- A proof-of-concept study of a passive in-home monitoring system for private homes in Japan.



社会福祉法人 東京聖新会
Social Welfare Corporation Tokyo Seishin-Kai



- Kodate, Obayashi, Maeda et al. (2023) Care professionals' experience of deploying an original non-autonomous air-purification robot in residential care homes in Ireland and Japan, *2023 5th International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA)*, Istanbul, Turkiye, 2023, pp. 1-9, doi: 10.1109/HORA58378.2023.10156802.

Harmonisation towards the establishment of Person-centred, Robotics-aided Care System (HARP: RoCS), 2019-2022



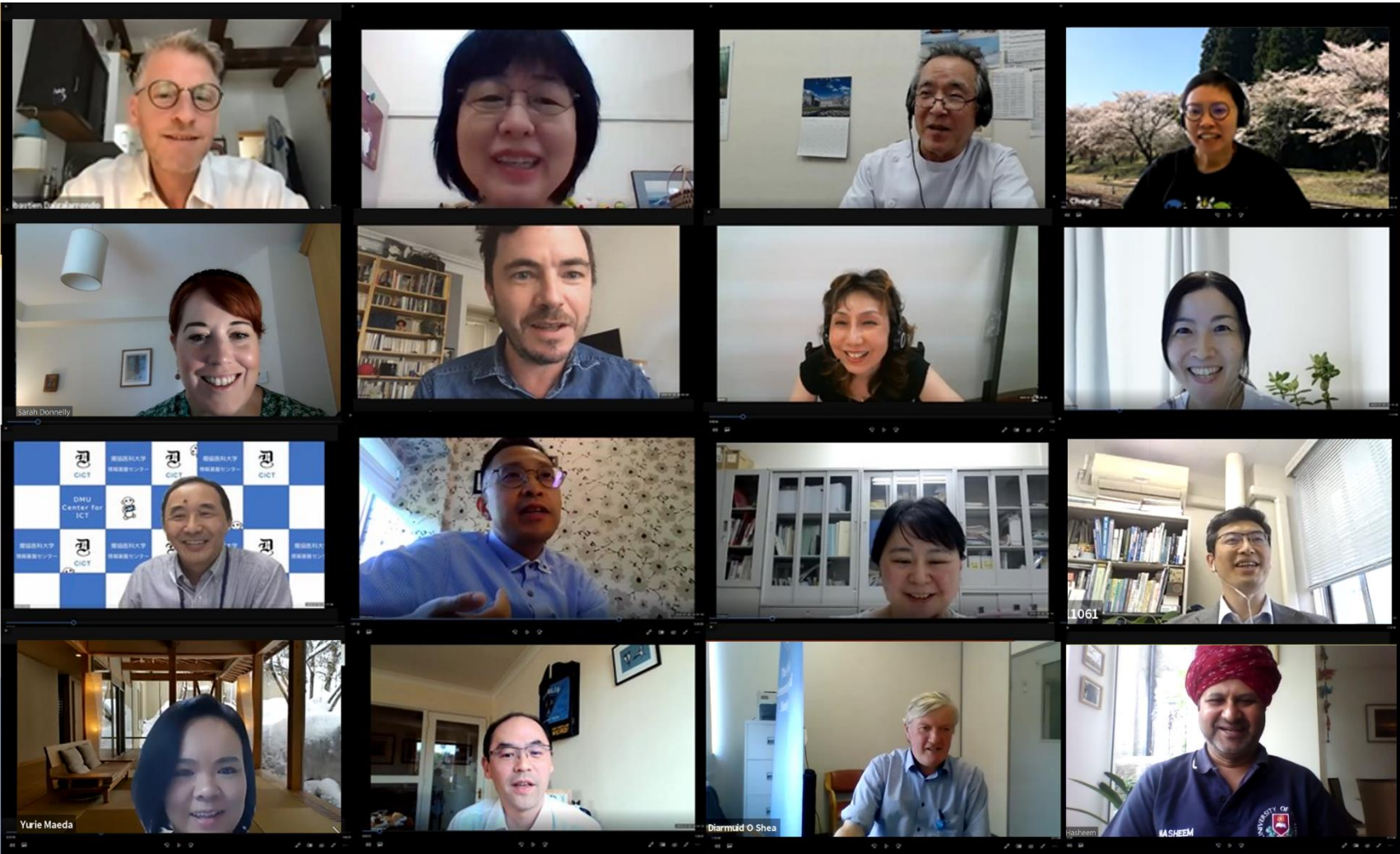
公益財団法人

トヨタ財団

Toyota Foundation Grant



'Co-Creating New Society with Advanced Technologies' (D18-ST-0005)



Responding to social needs...

SAR – Stevie



UV disinfectant Robot



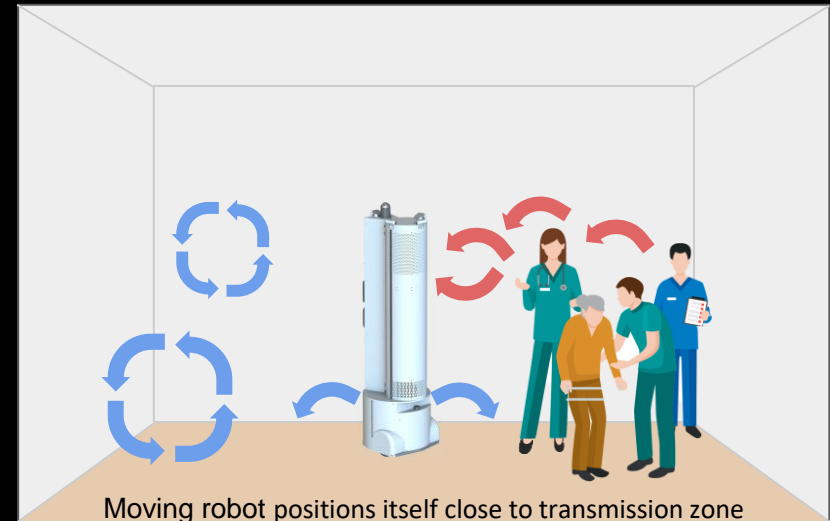
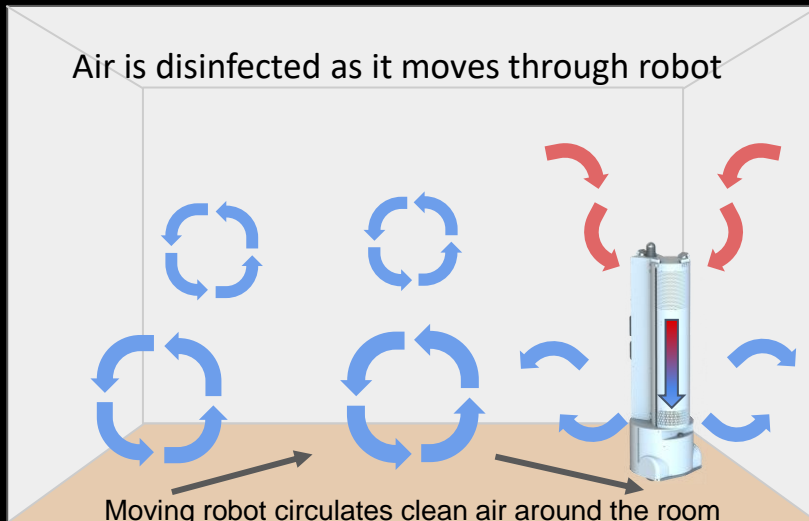
UV Air Disinfectant Robot



Moved away from automation
& humanoid



Robotic solution for residential care



Akara's disinfection robot solves the circulation problem by moving around the room.

Akara's disinfection robot solves aerosol droplet problem by positioning itself within near-field transmission zone.

New Project “Establishing Toyota-style Person-centered, Robotics-aided Care System” (T-PRoCS), 2023-

Co-PIs: Profs. Sebastien Lechevalier, Naonori Kodate & Mayuko Tsujimura



The T-PRoCS project aims to understand and assess the impact of assistive robots in Toyota Memorial Hospital, with a view to identifying an optimum implementation model for such technologies in care settings.

- 1) To gather data on the process of implementing an assistive and autonomous robot in a newly renovated hospital.
- 2) To explore views and work pattern changes among care professionals (e.g., nurses, pharmacists and medical technologists) following the introduction of the transport robots called POTARO which are originally designed and developed by Toyota's Frontier Research Center.

<http://ffj.ehess.fr/index/article/433.html>

Proof-of-concept – Home care delivery model

Sensor devices (biometric, temperature sensor and infrared camera sensor) were set up in the homes of five older people (aged 70 years and over), and the information was sent online to each older person, plus his/her family and caregivers.



- Obayashi, Kodate, Ishii & Masuyama (2023) "Assistive technologies and aging in place for people with dementia and disabilities: A proof-of-concept study with in-home passive remote monitoring with interactive communication functions", *Disability & Rehabilitation: Assistive Technology*.

Methods

Using these devices, fifteen care professionals delivered home care and remotely supported the home life of the older adults between December 2022 and February 2023.

A 24-hour home monitoring system was deployed and tested in the homes of five older adults living at home in the community.

In this experiment, the researchers followed the progress of the system's use, collected various data, and made improvements to the system based on that data, human-device interactions and the feedback from care professionals and care recipients.



Methods

The participating older adults and family members all consented to the research, which involved being observed or watched (all images are silhouettes only) when the system was in operation.

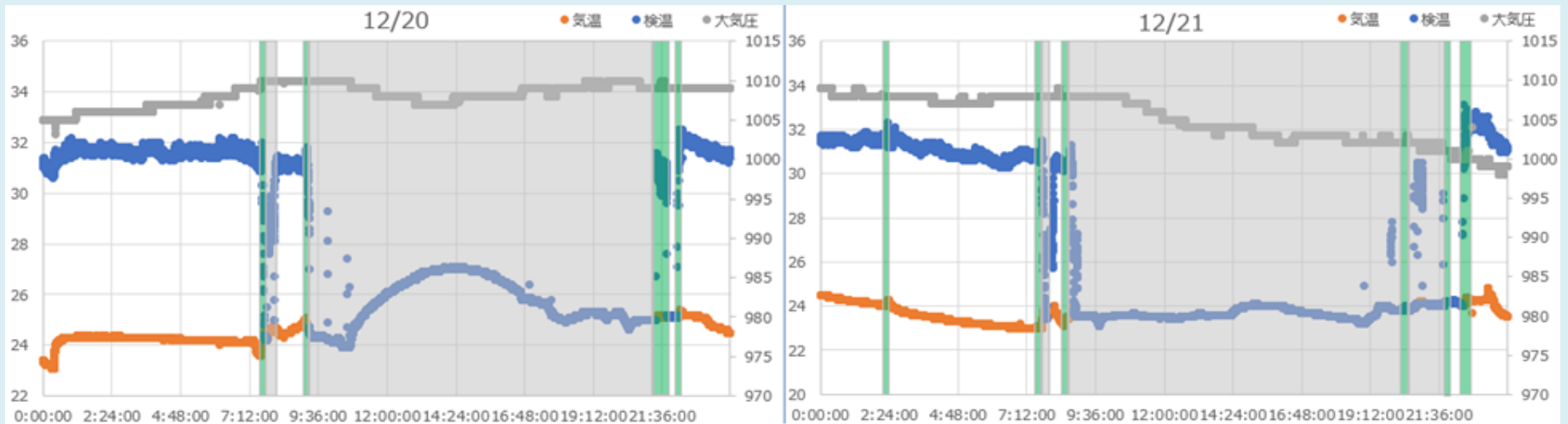
By the sensors, the living conditions and older persons' behavioral patterns were visualized and recorded. Care and support priorities for each participant became clearer, and help caregivers set individual goals.

A pre-post study design was adopted. We collected the system usability score (SUS), the International Classification of Functioning, Disability and Health (ICF) and the InterRAI assessments.



社会福祉法人 東京聖新会
Social Welfare Corporation Tokyo Seishin-Kai

Body temperature, room temperature and atmospheric pressure (two days)



一般社団法人
UAアーク
Universal Accessibility & Ageing Research Centre



社会福祉法人 東京聖新会
Social Welfare Corporation Tokyo Seishin-Kai

Findings

- Remote monitoring with alerts and two-way communication functions was highly valued by caregivers, as it provided an alternative model of care delivery, particularly for those living alone.
 - After the introduction of the PRM system, one of the five participants no longer required a helper to watch over him at night, and he is now able to live alone.
 - Another was able to give insulin injections without fail, and her application for admission to a residential nursing home was cancelled as a result.
- Comparing pre/post-intervention data, all five participants showed improvement in the scores for the ICF. Improvement was particularly noticeable in the three domains (self care activities, Interpersonal activities, Performing tasks in a major life area).
 - Even though the study lasted for a short period, it is significant to see that the conditions of four participants with dementia remained stable.
 - The only negative change was recorded for one person in the sub-domain (Informal social relationships (co-habitant)).



Putting it all together – findings so far...

- Social and users' needs must be reflected in the design and development of welfare technologies.
- 'Context' matters in social implementation. Embedding the use of ATs into an environment is ongoing while a better integrated care model is being sought.
- When care support is based on the premise of personalized care, there is a strong need for each professional and person to function as a team.
- The costs and benefits of different options available should be considered and weighed against the others.



Merci beaucoup / Thank you very much



Acknowledgements: I am grateful to research participants, collaborators and funding bodies (AMED & the Toyota Foundation). Thanks to Prof. Lechevalier, colleagues in JSPS, Toyo University and Université de Strasbourg.

naonori.kodate@ucd.ie / http://ffj.ehess.fr/naonori_kodate.html



一般社団法人
UAアーク
Universal Accessibility & Ageing Research Centre

