



MARIO Managing active and healthy aging with use of caring service robots

Title	MARIO Managing active and healthy aging with use of caring service robots
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- ようこそ
ありがとうございました
教授柴田は、今日ここに
私たちを招待して
- Yōkoso arigatō
gozaimashita kyōju
Shibata

Welcome and Thank
you very much
professor Shibata



NUI Galway
OÉ Gaillimh



NUI Galway, in top 250 of Universities

West of Ireland



NUI, Galway



NUI Galway
OÉ Gaillimh

- Founded in 1845 as Queen's College Galway.
- Opened for students on 30th October 1849.
- Offers academically strong programmes of teaching and research: Arts, Social Sciences, Celtic Studies, Commerce, Engineering, Informatics, Law Science, Medicine, Nursing, Midwifery, Health Sciences.
- NUI Galway has over 17,000 students (including 2000 students from 92 countries).
- NUI Galway has 90,000 alumni in 107 countries.



NUI Galway

- <http://www.nuigalway.ie/our-research/cited-researchers/>

CÚRAM

- The national research centre for medical devices, developing affordable, transformative solutions for chronic diseases.
- A Science Foundation Ireland research centre designing the next generation of 'smart' medical devices
- <http://www.curamdevices.ie/>

School of Nursing & Midwifery

<http://www.nuigalway.ie/nursing-midwifery/welcome.html>

- School established in 1993.
- Moved to our custom built building, Aras Moyola, in 2005.
- Currently 32 academic staff and 15 research staff
- Approx. 700 students.





Our Research

<http://www.nuigalway.ie/nursing-midwifery/Research/>

- We are a research intensive School that promotes and pursues research that is recognised as internationally distinguished in its quality and impact.
- As with our teaching programmes, we strive to ensure that our research improves nursing and midwifery practice, the health of those receiving nursing and midwifery care and informs health care policy.









Research Clusters



Research Examples

- A cluster randomised controlled trial (RCT) evaluating the effectiveness of a structured pulmonary rehabilitation education programme for improving the health status of people with chronic obstructive pulmonary disease (COPD). The PRINCE Study
- DARES and RCT evaluating the effectiveness of a reminiscence based programme in residential care.
- Fetal cardiotocography versus intermittent auscultation during labour ward admission: The ADCAR Trial.
- MARIO EU Project Horizon 2020 2015-2018
- CREST HRB feasibility trial focused on interventions in dementia, using cogknow app. 2016-2018

International Links

- Fairfield University,
Fairfield, Connecticut, USA
- Villanova University,
Pennsylvania, USA
- Case Western Reserve
University
- University of Barcelona









MARIO

Managing active and healthy aging with use of caring service robots



- Dementia -impaired: mental functioning, language and thinking.
 - Personality, functional and behavioural changes,
 - Globally 44.35 M people have dementia.
 - 1 new case every three seconds (Prince *et al.* 2015).
 - Dementia affects confidence to engage in social activities
 - Lonely and isolated
 - Significant burden on individuals and support systems
 - Using normal technology can be a real challenge
 - **More sophisticated innovative easy to use technology needed**
 - Recognises the cognitive abilities of PWD
 - Engagement in **meaningful activities** which reduce loneliness and isolation
- MARIO addresses this need through the use of companion robots.**

Why a companion robot?

- 30% of PWD are lonely
- MARIO uses enabling technologies; focuses on:
 - Promoting social connectedness, autonomy
 - Reducing isolation
 - Enhance QOL and slow deterioration



Why MARIO?

- An iPad /smart phone- too complex to access and use.
- iPad disembodied.
- MARIO specifically developed and designed with PWD and carers
- MARIO has
 - An embodied voice
 - easy-to-use interface;
 - a carer/ family can personalise it to individual needs and preferences

MARIO: Managing active and healthy aging with use of caring service robots

- Aims to address the difficult challenges of loneliness, isolation and dementia in older persons through companion/service robots.
- 10 partners from 6 Countries- France, Italy, Greece, Germany, Uk, Ireland
- 3 pilot sites for the introduction of MARIO robot –
 - Italy (Acute Hospital) , UK (Community) & Ireland (Nursing Homes)
- Value of Grant: €4million
- Duration 3 years February 2015- February 2018



User Led design

- Identify key requirements that PWD and Carers would like MARIO to have & be able to do, to reduce loneliness and isolation of PWD and enhance connectedness
- What would make MARIO acceptable?

Interviews

- PWD
NUIG=29; Stockport=15;
IRCCS=4
Total=48
- Carers
NUIG =49; Stockport=10;
IRCCS=20; R2M=13
Total=92
- Relatives: NUIG=7
- **Surveyed**: 130 Carers

The Robot - MARIO Kompai



<http://www.robosoft.com/news/kompai-at-the-2nd-wic-award/index.html>

To find out more go to <http://www.mario-project.eu/portal/>

Pilots



Italian pilot site

Italy - MARIO in Hospitals

- Led by IRCCS Casa Sollievo della Sofferenza
- Acute geriatric department (40 beds)
- Focus on Comprehensive Geriatric Assessment and Multidimensional Prognostic Index
- Short time interaction with PWD (7-10 days)



...what has been done

- Definition of specifications for CGA app
- Robot setup
- MARIO introduction to patients and hospital staff
- Acceptability evaluation of the robot appearance and basic interactions



Stockport pilot site

United Kingdom- Stockport Mario in the community

- Led by Stockport Council
- Mostly concentrating on home based testing
- Testing one to one engagement with a companion robot
- Testing ability to target isolation and reduce loneliness
- Involving Educate - people living with dementia - volunteer led



Irish pilot site

- **Ireland -2 long-stay residential care** settings with 100 residents each. More than 50% of residents have moderate to severe dementia

- **What was done;**

Preparation of the site

- Ethical clearance obtained
- Risk assessment completed in both sites
- Consent obtained from sites, residents and staff
- 16 staff trained between both sites and Mario champions identified

Acceptability work

- Acceptability testing of Mario with residents, their families and staff



Perceptions of people with dementia and carers on robot companions (MARIO)

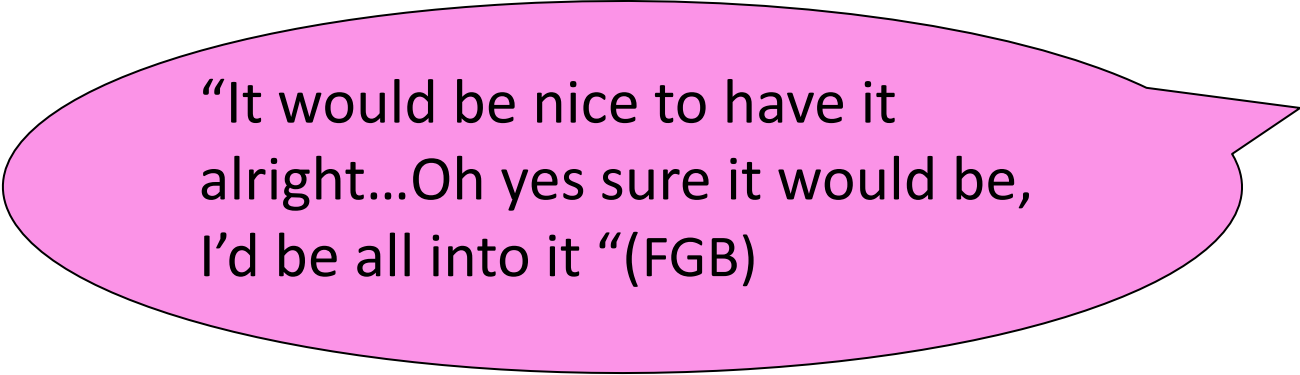


Methodology

- Three focus group interviews with people with mild/moderate dementia.
- 2 Focus groups with health care staff in nursing homes
- Qualitative content analysis was used to analyze the data
- Criteria identified by Lincoln and Guba (1985) was used to ensure and maintain rigor
- Ethical approval obtained

Findings

- The majority of participants were receptive to the idea of having the robot companion Mario Kompai



“It would be nice to have it alright...Oh yes sure it would be, I’d be all into it “(FGB)

What I would like Mario Kompai to do for me

- Recognise peoples individual voices and remind me of daily and weekly events;
- Store my phone numbers and important events like birthdays and anniversaries;
- Store and play on demand my favourite music and movies;
- Remind me to take my medications, and to eat and drink;
- Contact medical help if I fall or am unwell;
- Know the lay out of my home so he can direct me e.g. to the bathroom;

- Locate my keys or handbag
- Know my favourite book and read it to me
- Have interactive games that I would enjoy and would help me retain my abilities for longer

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“Maybe putting on a television... You want the channel or something. This yoke is, how do I get the channel, you know, it’s not easy...but if you had something that would say ok just give me a tip again about how to get BBC6 if there was such a thing...Because some of these remotes are so complicated, you’d want to be in the full of your health to follow them, I have to say”.

(FGC)

- Motivate me and deliver words of encouragement when I'm less inclined to do something e.g. 'lets do it" "Don't give up" " come on have a go" .
- Remind me what clothes to put on when I get muddled e.g. put your underwear on first Mary, ...now put on your dress"
- Play soothing music to me at night and to gently wake me in the morning

- At the start of the day tell me the date and time and year and a list of the day's activities and events planned for that day.
- Remind me that I had visitors earlier in the day and who they were as sometimes I forget and think no one has visited?

Appearance

- To speak more like a human maybe have the voice of someone I know
- But others thought that a familiar voice would be confusing
- The voice needs to be clear, he needs to speak slowly and a bit loudly so we can hear
- To have more softer or warm features- 'he is like a fridge'
- Could he have some hair? Can we put a shirt of some clothes on him to make him a bit more friendly looking?
- Could he have a bright warmer colour
- Can he appreciate humour and 'have a laugh' with us.

Concerns

- He needs to be robust, what if we accidentally knock into him or maybe we could even fall over him?
- Where will he hold all his information, on a 'chip in his head? 'Who can access my information that he has?
- Will 'my secretes' be safe with MARIO?
- Who will have access to the information that I give to MARIO and he has in his memory?
- Will he share private conversations that I have with one family member with another family member? Will he tell my business to someone else?

Staying Connected

- Most participants recognized the potential of Mario Kompai to keep them connected to family and friends
- Wanted him to have skype and thereby connect them to their friends and family

“...I could talk to my girls on skype” (FGA)

- Wanted him to have access to their life history/life story, their interests and hobbies and could use this information to foster conversations and reminisce about events that they could remember more easily.

- It is clear that that Mario Kompai has to really get to know the person and their daily routines

“...{Its} building in the person’s routine so it’s like you’re getting up, you’ve got to go to the toilet, you’ve got to brush your teeth, you’re going to have your breakfast now so it’s the routines as well as the memories but the routines I think are important...”(FGC)

Demographics of health professionals

- Nursing Home A (n=23)
 - Female (n=20) Male (n=2) 1 did not answer
 - Majority (n= 17) >40 yrs.
 - 13 RGN's 6 HCA 2 Activity Cord. 1 Physio. 1 OT.
- Nursing Home B (n=26)
 - Male (n=4) Female (n=21) 1 did not answer
 - Majority (n=18) >40 yrs.
 - 15 RGN's 7 HCA 1 Activity Cord. 1 Physio. 2 OT.

What we would like in Mario Kompai

- **All welcomed the idea of MARIO and were keen to meet him in person!**
- Have MARIO undertake some of the Comprehensive Geriatric Assessment,
- Have a falls detection sensor; Sensors to pick up the residents physiological status;
- Voice activation and face recognition
- Ability to skype ; take photos of the resident to share with family members
- Record visitors names and details when they visit?
- Orientate residents to time place and date ;
- Must have the persons life story and be individualised to each person.
- Be able to read out local parish newsletters, show local football games on his TV screen; the horse racing etc.
- Identify someone in distress in terms of their emotional wellbeing

- Could he smile, express some emotion, appear to make eye contact
- Needs to speak like a human not a computer or a 'sat nav'
- Maybe give him a wig and put a shirt on him, make him more friendly

Concerns

- Space
- Privacy and confidentiality of the information stored in MARIO.
 - Who owns that information? How will it be stored ? Will the information be backed up and will it be safe?
- Needs to be robust as they could hit him with their stick on the head or the body.
- Who will be responsible for MARIO when he is in the home, what if his system crashes while he is here, how does he reboot?
- Will MARIO replace the need for a nurse ?



So what does this mean for MARIO?



- Prompts the PWD maintaining memory
- Engages PWD in individualised meaningful activities
- Enables PWD to use technology and reduce dependence on others
- Talks to the person; Facilitates & supports choices
- Connects PWD to family & friends
- Personalised activities based on life history

Stay up-to-date on the MARIO Project at:

- <https://www.facebook.com/mario.project.eu>
- <https://plus.google.com/116012490277146118083/posts>
- <http://www.mario-project.eu/portal/>
- https://twitter.com/mario_project
- <https://www.youtube.com/channel/UCdxaxbf9BLZjl698HCuTyBQ>
- Paper Casey et al 2016 is available at <https://aran.library.nuigalway.ie/handle/10379/5904>

- thank you very much
and thank you for your
hospitality

非常にあなたに感謝し、
あなたのおもてなしをあり
がとうございました

- Dōmo arigatō
gozaimashita