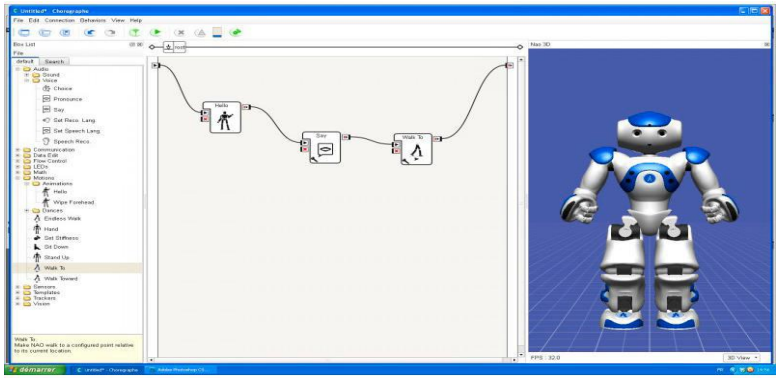
Robots in Care Homes: How a PhD student came to understand their potential value by living alongside residents for 6 months

Blog written by **Dr *Yordanka Karayaneva***, ex-PhD student Data Driven Research & Innovation (DDRI) Programme Coventry University.

Past

I graduated in 2017 with a BSc in Computer Science from Coventry University.
During my degree, I had presented at a conference on the value of the humanoid **NAO robot for children's** visual learning enhancement. But the idea that humanoid and other robots might be of value for older people was not on my radar. I had never considered that robots might be of **value in a care home**.



I saw an advert about a new opportunity with the launch of: *"The Data Driven Research and Innovation (DDRI) Programme: a major strategic initiative by Coventry University pursuing cutting edge research to support healthy ageing, and improved well-being and care.*

The DDRI programme involved a **'living lab' network** of care homes and sheltered housing, allowing multiple stakeholders to identify, test and refine new technology solutions. Coventry University was offering 7 fully funding DDRI PhDs. The programme included a PhD funded by Coventry to be undertaken in partnership with the Robotics Lab at The University of West England (UWE), Bristol. This PhD aimed to "*Develop a holistic method for determining applications for robotics in care homes*".

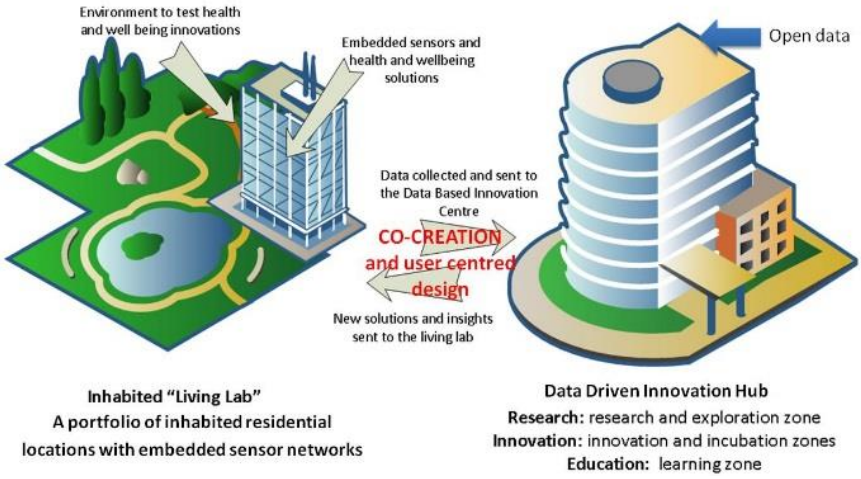
The research was part of a strategic collaboration with *WCS Care Group*, one of the UK's leading innovative residential care providers. WCS would provide a 24/7 'living lab' setting with access to

resources and facilities. This would help the PhD student determine the value of robotics in care home environments, especially which factors could support the introduction and acceptance of different types of robots. The Coventry PhD was linked to a sister PhD (led by UWE) which would focus on technical aspects such as intelligent data processing and data fusion for development of cognitive assistants.

I applied... and, following an interview by a panel that included the innovation lead in WCS as well as Coventry University academics, I was offered a studentship. I was delighted and started my research in the autumn.

What is a 'Living Lab'?

'Living Labs' are **ethically driven, user-centred design** environments. Residential homes based on these principles can provide unique test-beds with the potential for rapid innovation. In essence, living labs are user-focused, experimental environments in which users and producers co-create innovative solutions in **real-life settings**, due to an ability to adopt and adapt innovations quickly. Thus, in WCS the living lab approach supported the management and development of existing facilities, and helped to create a blueprint for future innovations.



In early 2017 WCS Care launched the first, and only, care home based Innovation Hub, which was sponsored by a number of product and service providers as well as Coventry University Visitors could see innovations in use and talk to staff. There were over **1000 national & international visitors** in the 3 years that the hub was open.

Another first

In 2018, as part of the DDRI Programme, WCS Care and Coventry University decided to provide an opportunity for a student to live (rent-free) in their new, state-of-the-art care home - **Castle Brook, Kenilworth** to undertake research. The student would be expected to volunteer their time, contributing to activities for residents and general day-to-day life by spending time with residents, playing games or

just passing the time of day over a cup of tea. In exchange for free bed and board they were expected to contribute 30 hours a month to such activities.

Before this initiative was launched in the UK, focus groups were held with students and staff to consider some of the practicalities. For example:

- what students would need in their rooms, what house rules were required
- what students might gain (other than free accommodation)
- how students could best contribute to the community
- how transition for a young person into this community is best handled
- how to prepare students for inevitable occurrences such as illness, death of residents.

Following this, students were invited to apply. I applied to spend 6-months living in Castle Brook care home and was successful.

Why move into the care home?

The living lab setting was important for my research on robotics. However, although there is considerable potential for robot innovations to improve care, it appeared that this kind of technology uptake had been limited to date. This might be due to **poor understanding** of needs and preferences – resulting in "technology push" rather than "user pull".

By living in the care home, observing every-day life and contributing to daily activities, I hoped to better understand what types of robot (physical or sensors) might be helpful and to work **collaboratively with staff** to identify residents' preferences.

My life in the care home

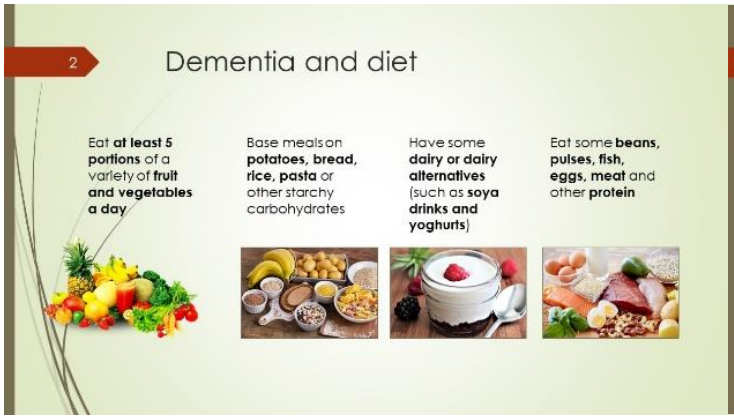
I moved to **WCS Castle Brook, Kenilworth** in **August 2019**. This exciting moment to say the least marked the beginning of my exploration of older adults' lives in a residential setting. During my first days, I delved into the lifestyle of the residents and their regular routines. Gradually, I managed to participate in the scheduled daily activities such as playing table tennis and going for a walk in the garden with the residents. In addition, I was fortunate to befriend some of the residents who were happy to share their life stories and daily struggles with me. Along with the scheduled daily activities, I organised an event for helping older adults with using their computers and mobile phones. The event was attended by several residents who then managed to send an email to their loved ones. Moreover, I accompanied the residents on short trips where we shopped and had meals together.

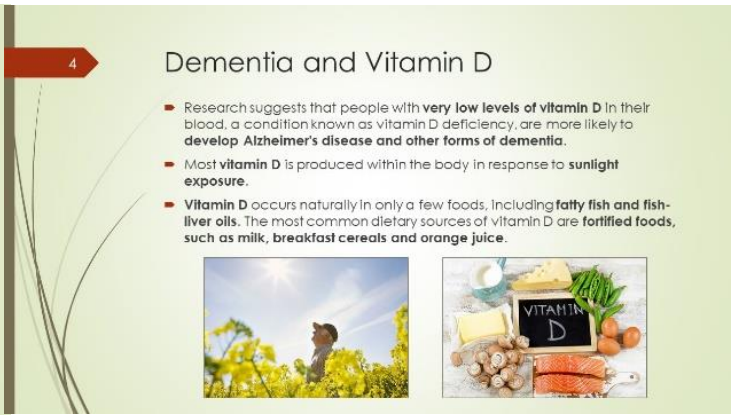
Along with my everyday duties with organising various events and helping the residents with their daily routines, I successfully conducted three major activities in the care home attended by several residents:

- The first activity was focused on giving a **presentation** to the residents covering the **history, traditions and customs behind Halloween** on 31/10/2019. The digital presentation was delivered in the care home cinema, which ended with a quiz. Based on the contents of the presentation, the quiz was met with excitement by the residents. All participants received small awards for their participation and correct answers.

- The second activity was based on delivering an **exercise routine** performed by the **humanoid robot NAO**. Coherent with the age of the participants, the routine lasted 10 minutes by including simple activities. The exercise routine was performed to two groups of residents based on different floors in the care home. The residents enjoyed the routine by even expressing deeper interest in the robot and any future activities with it.

- The third activity considered **the importance of dementia** for older adults and more specifically its **prevention**. Therefore, a printed presentation was prepared by strictly following the dementia prevention guidance imposed by the **National Health Service (NHS)** and the **UK's Alzheimer's Society**. The presentation was delivered in the communal area and coffee shop where residents normally gather for their morning tea. Several residents participated by listening and actively discussing different factors that are scientifically known to reduce the risk of developing dementia. As a conclusion, the presentation familiarised the residents with any lifestyle choices, which might make a difference to their lives.





As part of my PhD research project, a **questionnaire** was administered in the care home among those residents who could provide consent. The questionnaire examined the residents' preferences, attitudes, and expectations towards the use of ambient sensors for activity monitoring as well as physical robots for various purposes and activities.

A list with all residents was prepared by the care home manager. The relevant residents were then approached to explore their willingness to participate. As a result, the majority of residents agreed to participate and then had the opportunity to complete their questionnaires. Considering the old age of the survey participants, the questionnaires were completed individually. The process of completing a single questionnaire lasted between 15 to 30 minutes depending on the capacity of the participant. As some of the participants had visual problems, I read the questions by providing examples to further facilitate their understanding. Therefore, the participants either verbally expressed their answer which was written by me or wrote the answers on their own. Finally, **21 (18 female and 3 male) participants** successfully contributed to the survey. The analysis of their responses has led to interesting findings and further discussion.

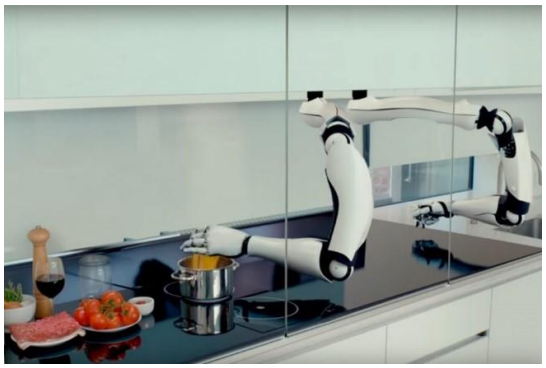
In **February 2020**, I left the care home by saying goodbye to the residents and the care home staff. As a conclusion, the exciting and novel time spent at the care home was beneficial for me as a person and as a student. It was a unique experience, which will have a mark on my life forever.

What I learnt from the residents

The residents at **WCS Castle Brook, Kenilworth** were very kind and patient by welcoming me to their lives. As a young and working person who is constantly on the go, I learnt to be more **patient and careful** when explaining concepts and working with people. As a result, this has led to more peace of mind to my life by carefully listening to people and explaining information – as it is the case now as I am undertaking the role of a lecturer and student supervisor at Teesside University, Middlesbrough.

In addition, I learnt that the most important virtue is **being human and helping others** in need instead of purely focusing your life to achieving a certain goal and having success. Older adults may often **feel lonely** and having someone to **share their stories** with can have a huge impact on their lives.

As a lecturer and researcher in Artificial Intelligence and Robotics, I learnt that older adults still value **human interaction** to the greatest extent. A physical robot would be then preferred for executing manual and boring tasks such as **cleaning and cooking** (based on the results of questionnaire regarding the most preferred activities to be executed by a robot), while communication and companionship are preferred to be performed by a human being.



Finally, I learnt **wisdom** by knowing that every daily struggle we consider now eternal will soon pass and disappear. The importance of life is **spending more time with our loved ones** and **supporting** them through their struggles and pain. As none of us is sinless, **forgiving** can benefit both sides.

To conclude, the invaluable experience at the care home will have a deep impact on my life and mindset. I hope I will be able to pass the wisdom and lessons learnt to my children and grandchildren one day.

The future

In May 2022, I moved to my first academic post as Lecturer in the Department of Computing & Games at Teesside University, Middlesbrough.
I hope to continue to develop my research interests here. The University has various research interests in ageing, including artificial intelligence (AI-based) healthcare systems for elderly people; plus a £22.3million National Horizons Centre of excellence for the biosciences and healthcare sector.

Want to find out more?

You can see me and two other DDRI PhD students talking about our research here:
https://coventry.wistia.com/medias/v9w159u05q
Link to my PhD thesis from Coventry University:
https://pure.coventry.ac.uk/ws/portalfiles/portal/54964406/Karayaneva2022.pdf

To find out more about WCS Care, visit **www.wcs-care.co.uk**, find them on Facebook at **www.facebook.com/wcscare** or add them on Twitter by searching **@WCS_Care**.