ROCY

the RObot Carer for the elderlY

Miguel P. Xochicale
13 March 2017

According to The World Health Organisation between 2015 and 2050, the proportion of the world's population over 60 years will nearly double from 12% to 22%.

The World Health Organisation pointed out that some challenges in the Healthy Ageing arena are mainly focused on the improvement of methodologies for:

* (a) measurement
* (b) monitoring and
* (c) understanding of the physical activity.

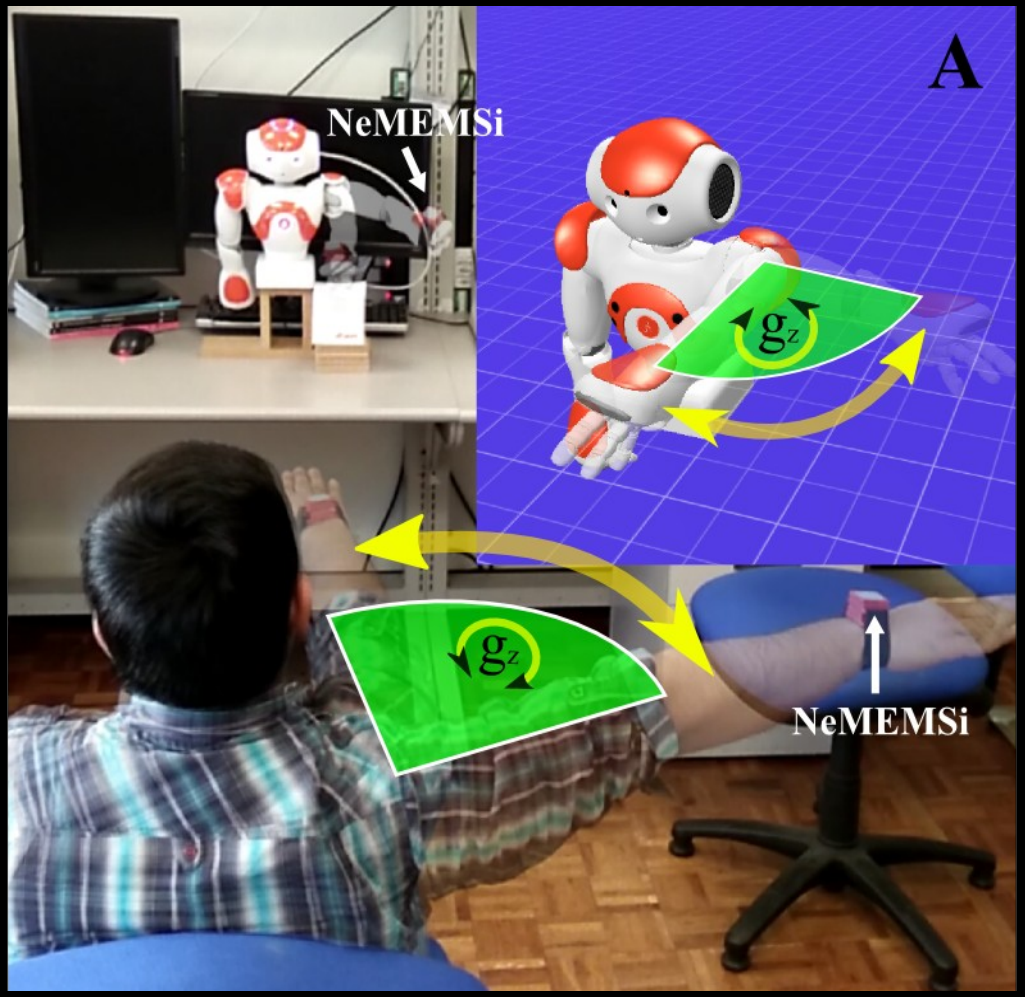
For this competition, I am proposing to tackle the previous points with humanoid robots and wearable sensors.
For the last 10 years, different robots have been used to contribute to a healthy ageing with the elderly. For instance:

RIBA-II, can crouch down and lift patients off a futon at floor level and detect person's weight using its capacitive tactile sensors.

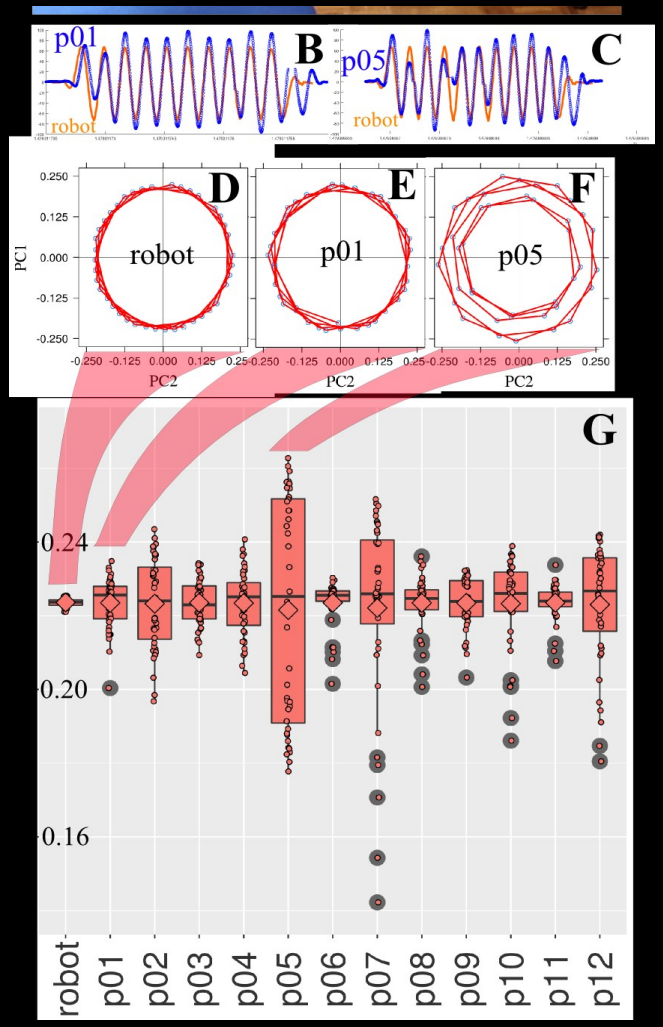
PARO, with its five sensors, can perceive person's behaviour and its environment.
to reduce the patient stress, improve patient's relaxation and motivation.

PALRO, has been used for recreation activities for elderly like stretching exercises, games, quizzes and music.

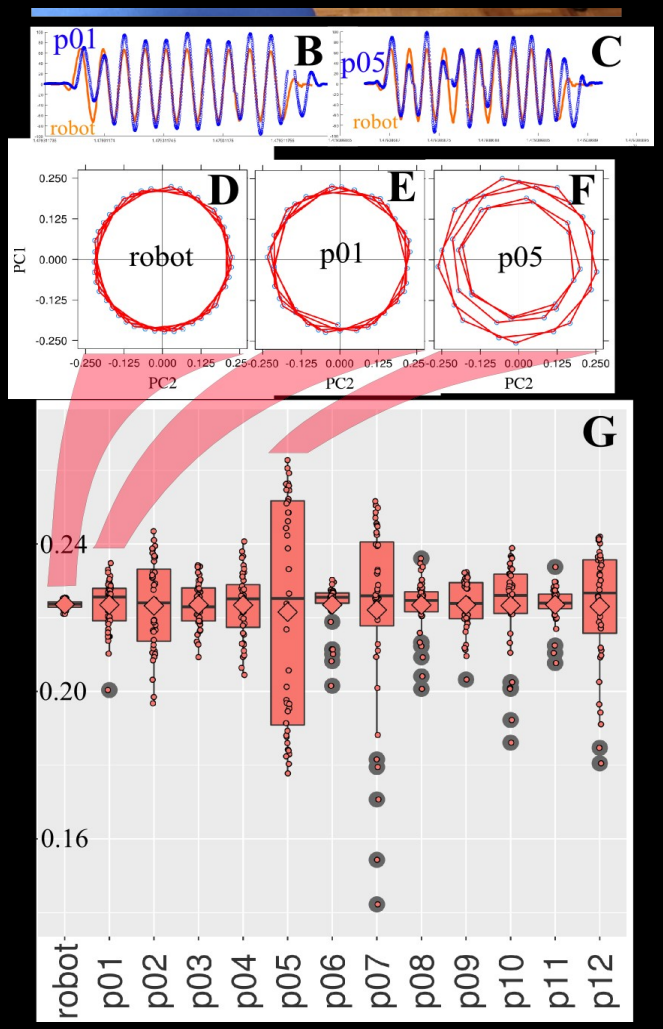
NAO, with its 25 degrees of freedom,
has been used in rehabilitation therapies for the children
as well as a robot coach for the elderly.



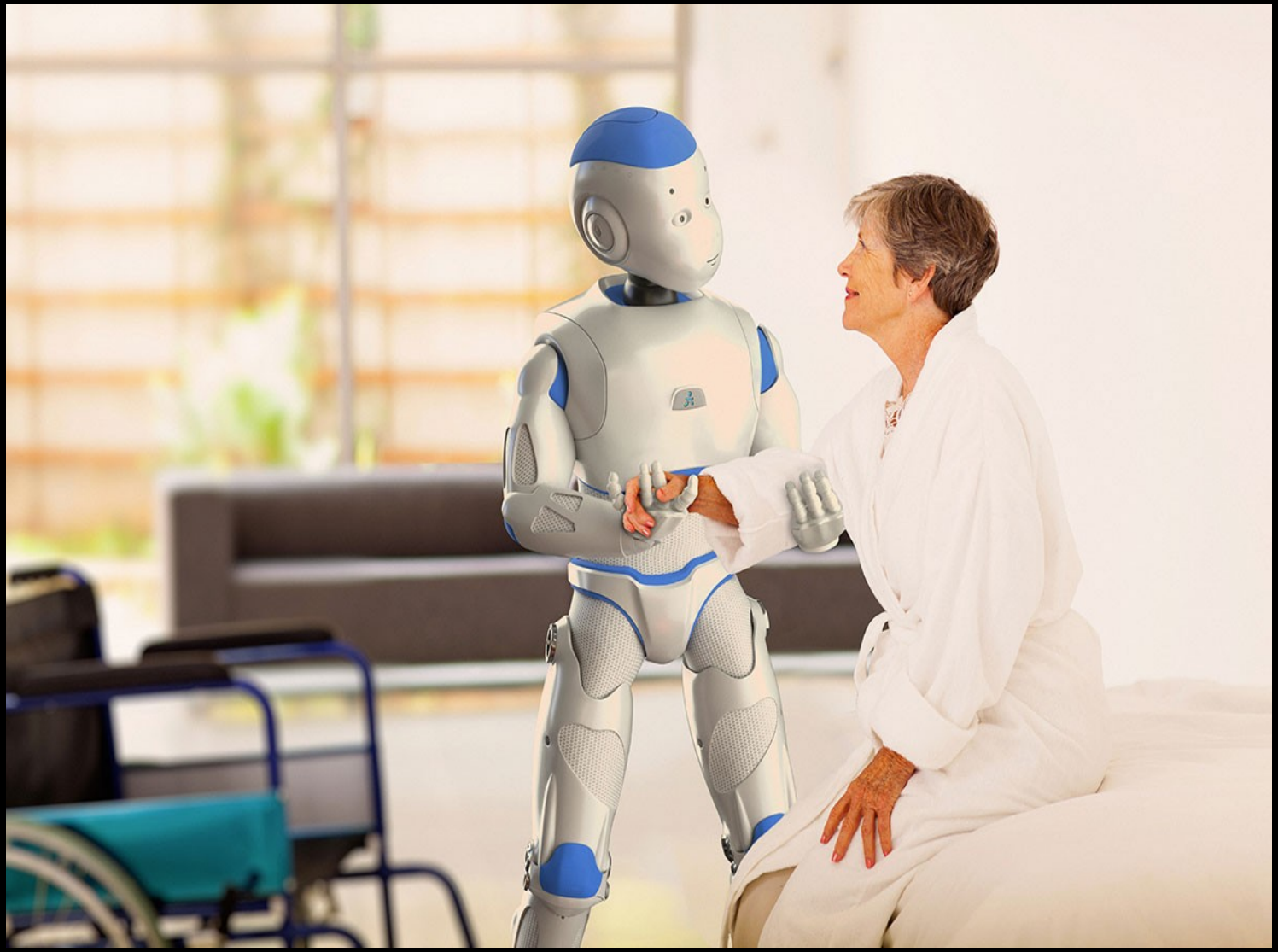
Therefore, for this competition, I am proposing the project ROCY
in which NAO is used to create the base line of movements
for the improvement of measuring, monitoring and understanding the physical activity of the elderly.



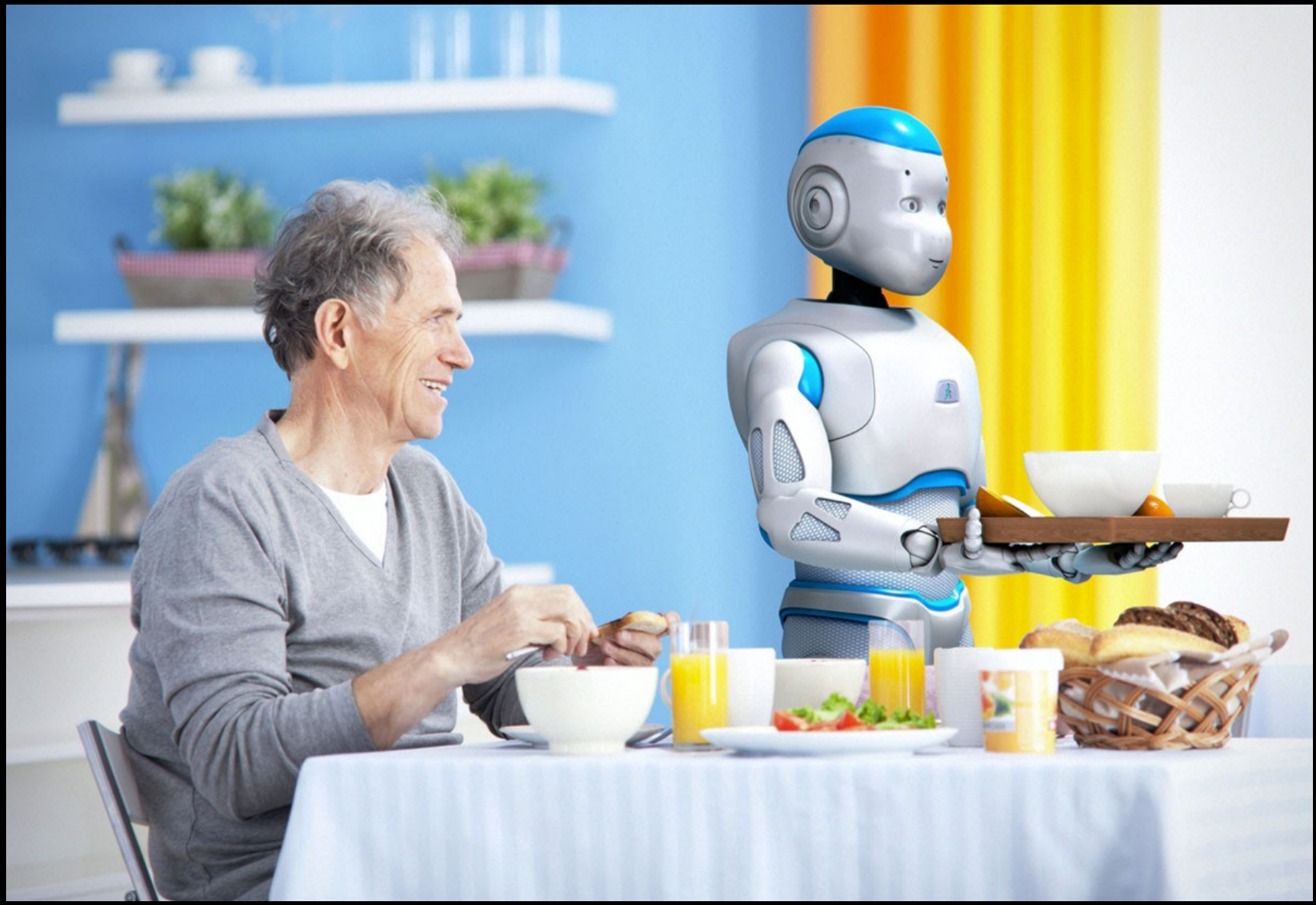
As a pilot experiment,
12 right-handed healthy participants with mean age of 19.5 were asked to move their arm in horizontal movement in order to create a metric for a human-imitation activity.



With this, I founded out that although the performed arm movement of the healthy participants is very simple, the metric revealed that participants showed different levels of imitation which is a very promising result.



However, there are still many challenges to tackle, like:
* Create more realistic environments where the elderly can be monitored better.
* Use humanoid robots that are able to perform more complex movements
* Use reliable motion capture systems like
the ones that fusion video and wearable inertial sensors.



All in all, I believe that the use of humanoid robots with wearable sensors is going to be a very promising area of research in the next 5 years.