

# ROCY

## RObot Carer for the elderlY

**Miguel P. Xochicale**

Doctoral Researcher in Human-Robot Interaction  
University of Birmingham, UK



@\_mxochicale

# The world's population over 60 years

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

<b>2015</b>	<b>&gt;&gt;&gt;</b>	<b>2050</b>
<b>12%</b>	<b>&gt;&gt;&gt;</b>	<b>22 %</b>

# Challenges for a Healthy Ageing

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

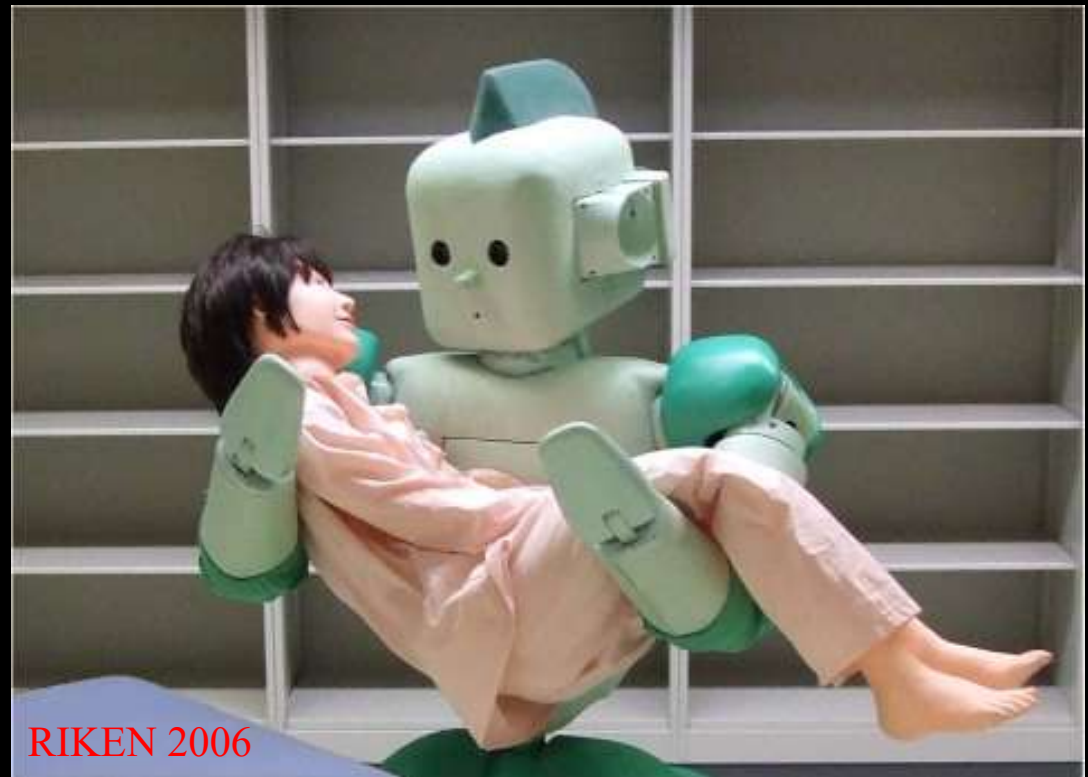
- ▶ **Measurement**
- ▶ **Monitoring, and**
- ▶ **Understanding the physical activity of the elderly.**

# Caring the Elderly using Humanoid Robots

- RIKEN
- RIBA-II
- ROBOCOACH
- PALRO
- NAO

# Caring the Elderly using Humanoid Robots

- Feedback of force using tactile information
- Sound localization
- Tracking of human face by integrating auditory and visual information
- Smell discernment by semiconductor gas sensor



RIKEN 2006

[http://rtc.nagoya.riken.jp/RI-MAN/index\\_us.html](http://rtc.nagoya.riken.jp/RI-MAN/index_us.html)

# Caring the Elderly using Humanoid Robots

- RIBA-II can crouch down and lift a patient off a futon at floor level.
- RIBA-II can detect a person's weight from touch alone using capacitive tactile sensors made of rubber.



RIBA-II 2011

[http://www.riken.jp/en/pr/press/2011/20110802\\_2/](http://www.riken.jp/en/pr/press/2011/20110802_2/)

# Caring the Elderly using Humanoid Robots

Robocoach coaches the elderly to perform 15 types of arm exercise.



Ngee Ann Polytechnic's School of Engineering, 2015

# Caring the Elderly using Humanoid Robots

- Analysis of sound types, recognition of faces, detection of moving bodies, identification of individuals from voice prints, recognition of sound source direction.
- PALRO can be used for recreational activities for the elderly covering games, exercises, quiz and music.



Palro Robot 2016

<https://palro.jp/en/feature>



# Caring the Elderly using Humanoid Robots

- NAO has been used as an instructor for therapies in rehabilitation



<https://www.ald.softbankrobotics.com/en/cool-robots/nao/find-out-more-about-nao>

# Caring the Elderly using Humanoid Robots



<https://www.ald.softbankrobotics.com/en/cool-robots/nao/find-out-more-about-nao>

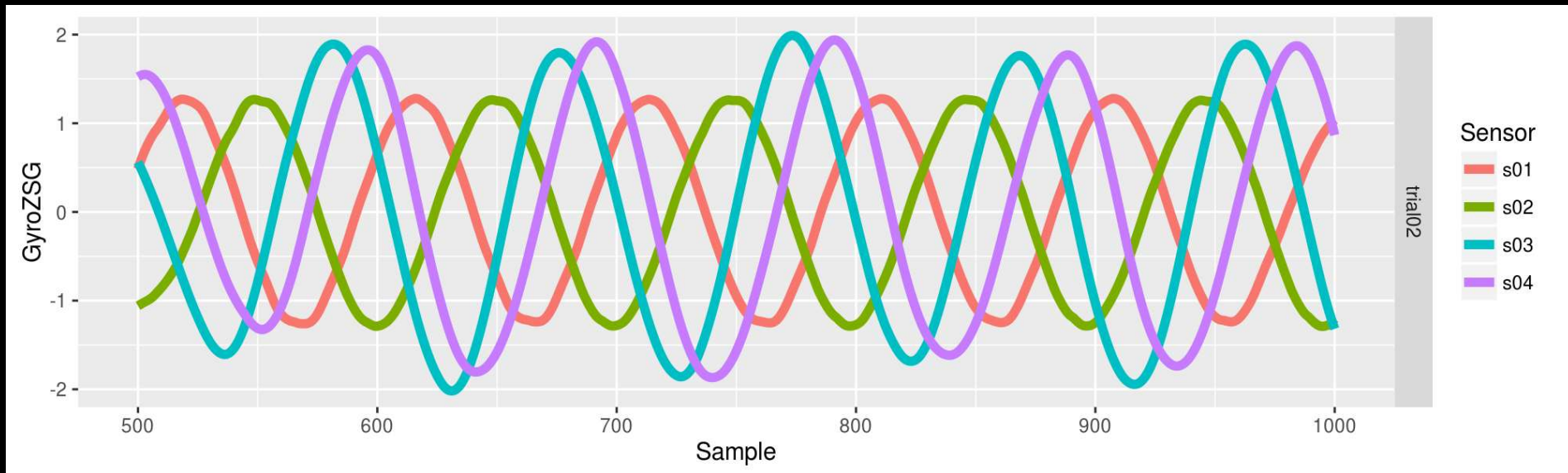
# PROPOSAL

The aim of ROCY is to develop methodologies for

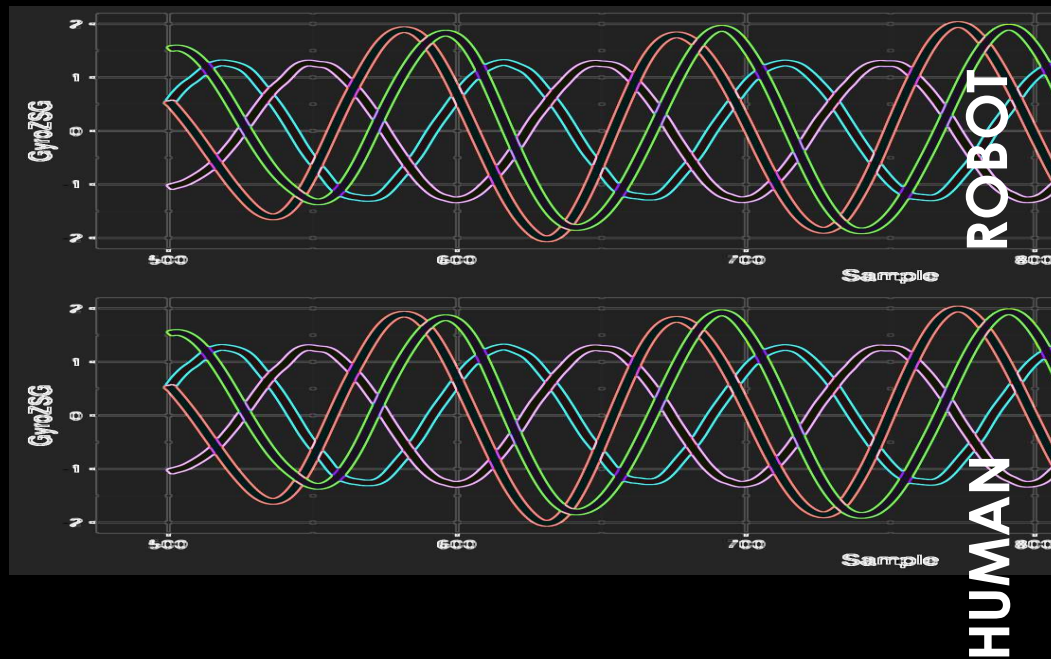
- ▶ **Measurement**
- ▶ **Monitoring, and**
- ▶ **Understanding the physical activity of the elderly**

ROCY's DEMO

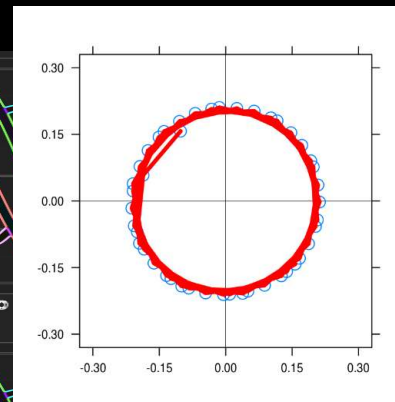
# Good Human-Robot Imitation



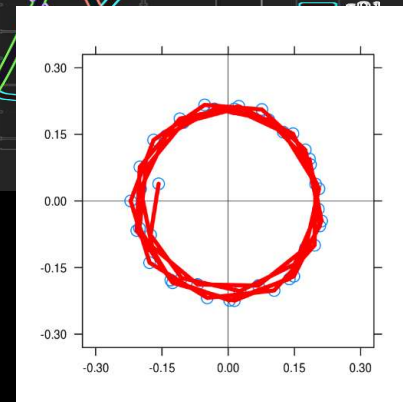
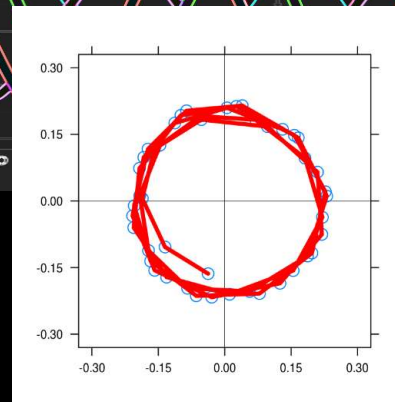
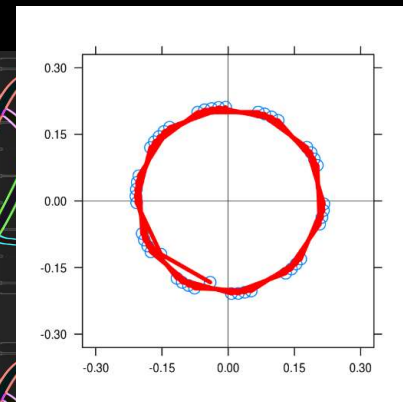
# Good Human-Robot Imitation



Left Hand

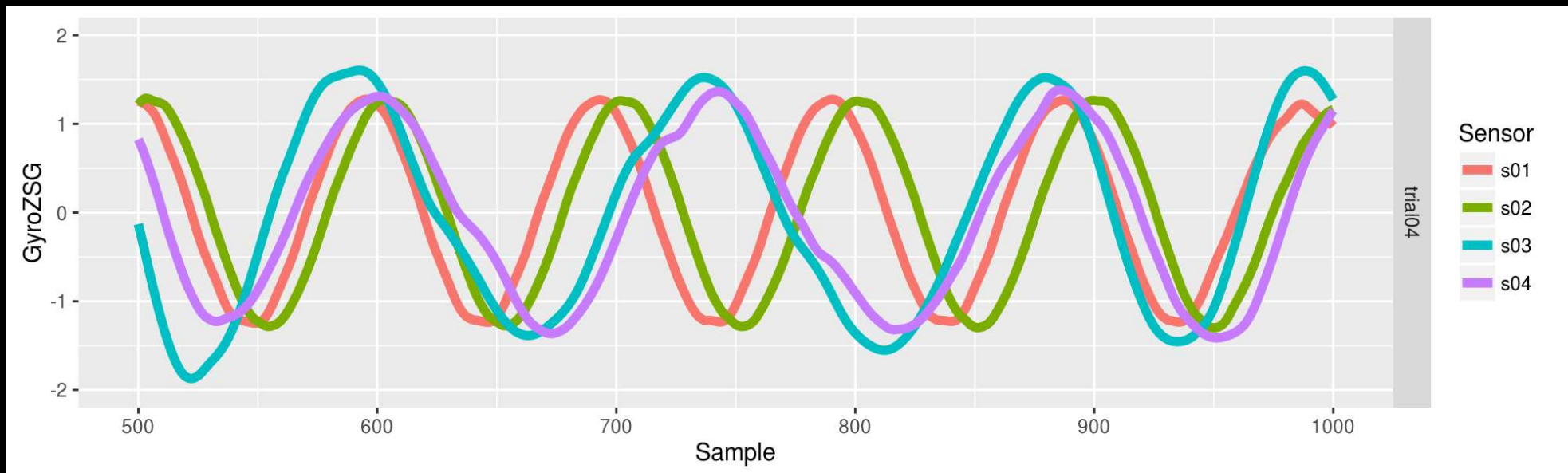


Right Hand

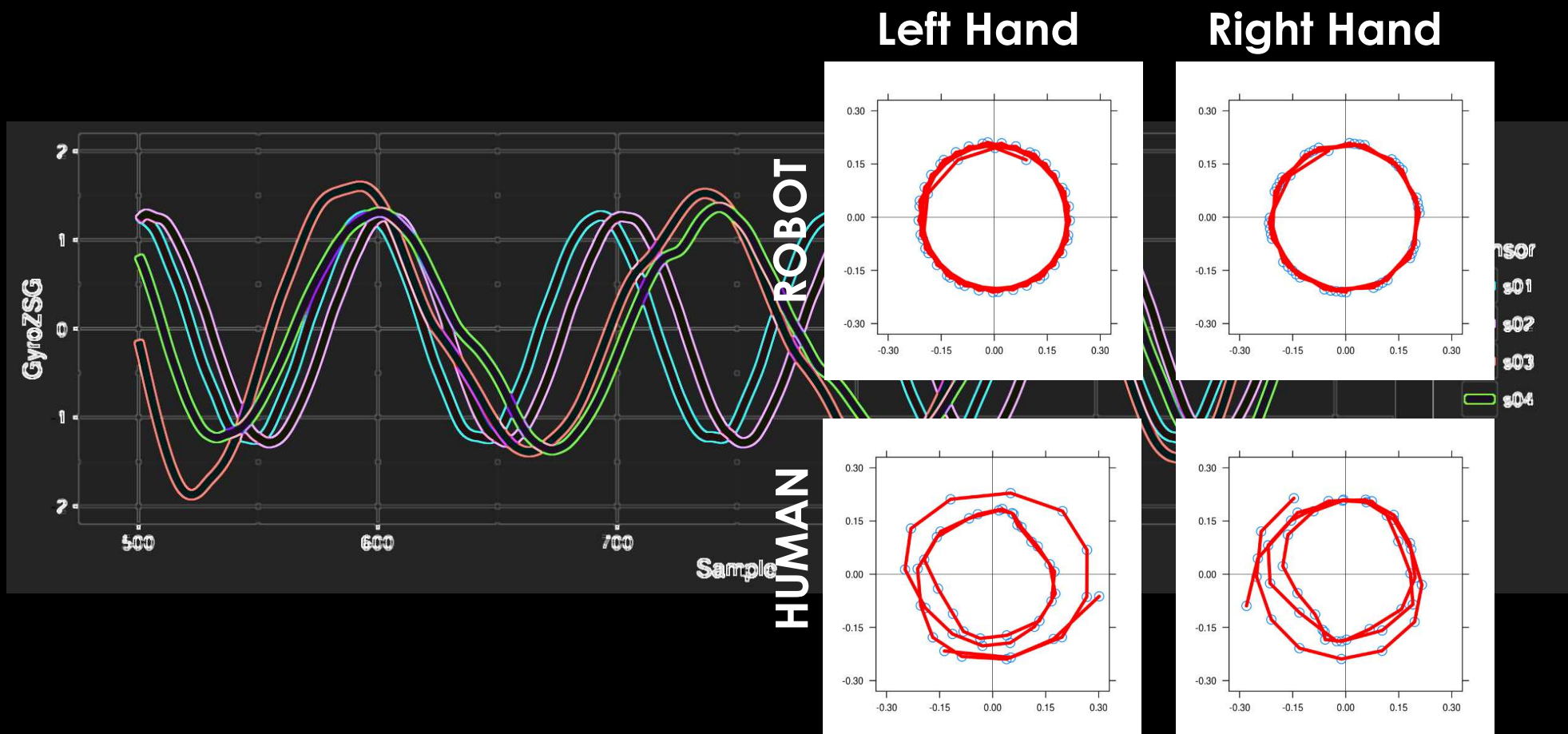




# Bad Human-Robot Imitation

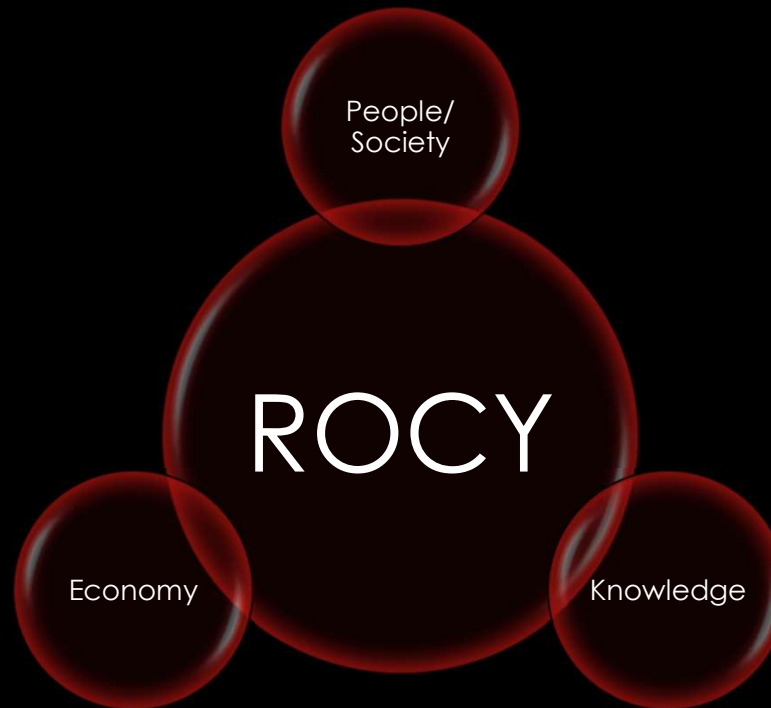


# Bad Human-Robot Imitation





# Why you should invest in ROCY?



# ROCY

## RObot Carer for the elderlY

**Miguel P. Xochicale**

Doctoral Researcher in Human-Robot Interaction  
University of Birmingham, UK



@\_mxochicale