

AI Empowered Unobtrusive Sensing for Ageing in Place



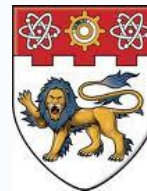
Miao Chunyan

Professor & Director

LILY Research Centre, Nanyang Technological University



Joint NTU-UBC
Research Centre of Excellence in
Active Living for the Elderly (LILY)



**NANYANG
TECHNOLOGICAL
UNIVERSITY**

Content

- About LILY Research Centre
- Technologies towards Ageing-in-Place Eco-System
 - Smart Home
 - Silver Assistants
 - Pillbox Fusion
 - Serious Games
- Q&A

Teamwork from LILY Research Centre

Jointly established in August 2012 by:

- Nanyang Technological University, Singapore
- University of British Columbia, Canada

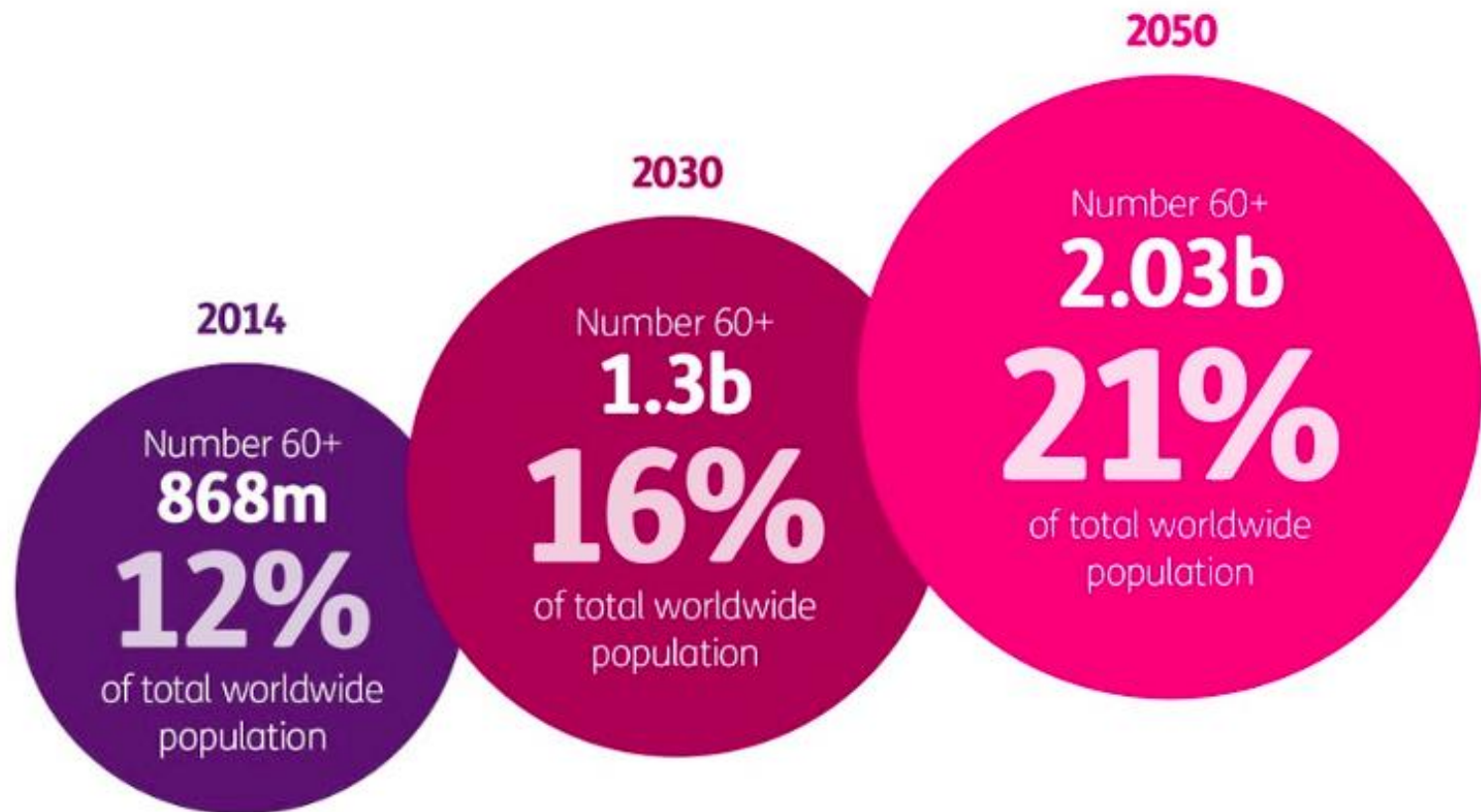
Funding support from NRF under its IDM Future Funding Initiative

Over **65** multidisciplinary members



Global Ageing Challenge

Number and proportion of people aged 60-plus worldwide in 2014, 2030 and 2050



Source: UNDESA Population Division, Population Ageing and Development 2012, Wall Chart, 2012; UNDESA Population Division, World Population Prospects: the 2012 Revision, 2013.

Physical and Emotional Care Needs for Elderly

Many elderly face both **physical** and **emotional** challenges:

- Physical Issues: possibly multiple chronic conditions.
- Emotional Issues: loneliness, anxiety, depression, ...

Key Challenge: Lack of healthcare resources to accommodate all seniors in healthcare institutions.

Promising Solution:
Ageing in place



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Eco-system for Ageing-in-Place Developed at LILY

PLATFORMS



Smart Home



Virtual Assistants



Serious Games

ENABLING TECHNOLOGIES



AI



Human Factor



IOT



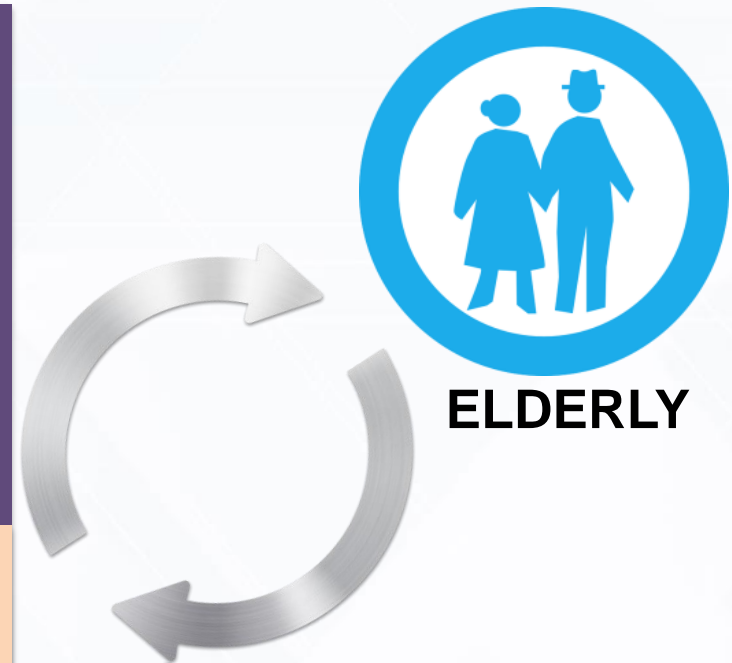
VR/AR



Data Analytics



HCI



CAREGIVERS



Family



Community



Medical

Ageing in Place

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Smart Home – How It Works (3D Replay)



3D animation to visualize and replay the major activities.

VIRTUAL ASSISTANTS

Virtual Assistants – Two Examples



Smart Butler

- All-round tender care in the aspects of:
 - physical,
 - cognitive,
 - emotional,
 - social and sustainability.

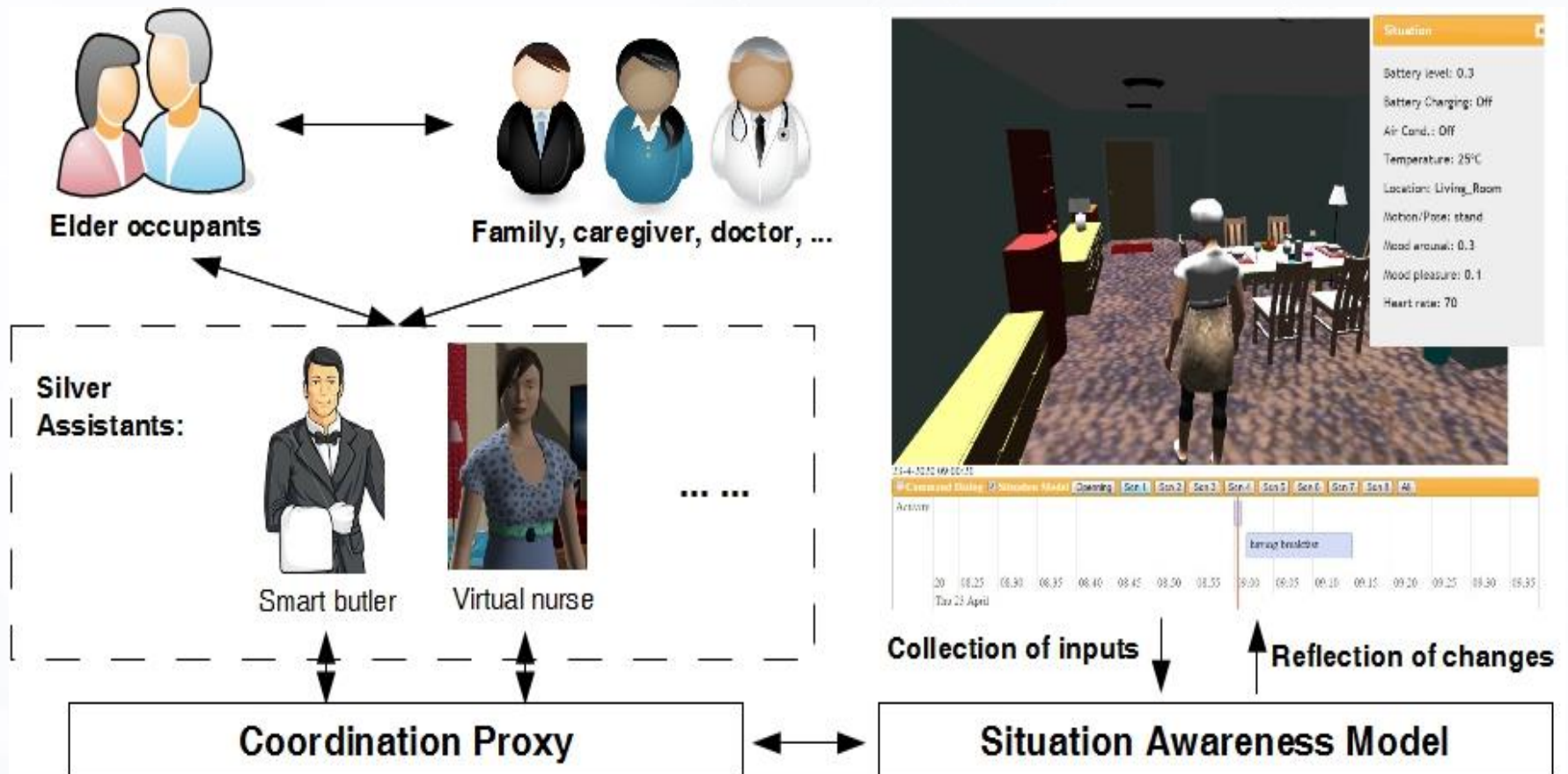


Virtual Nurse

- Promoting healthy lifestyles
- Providing health-related recommendations

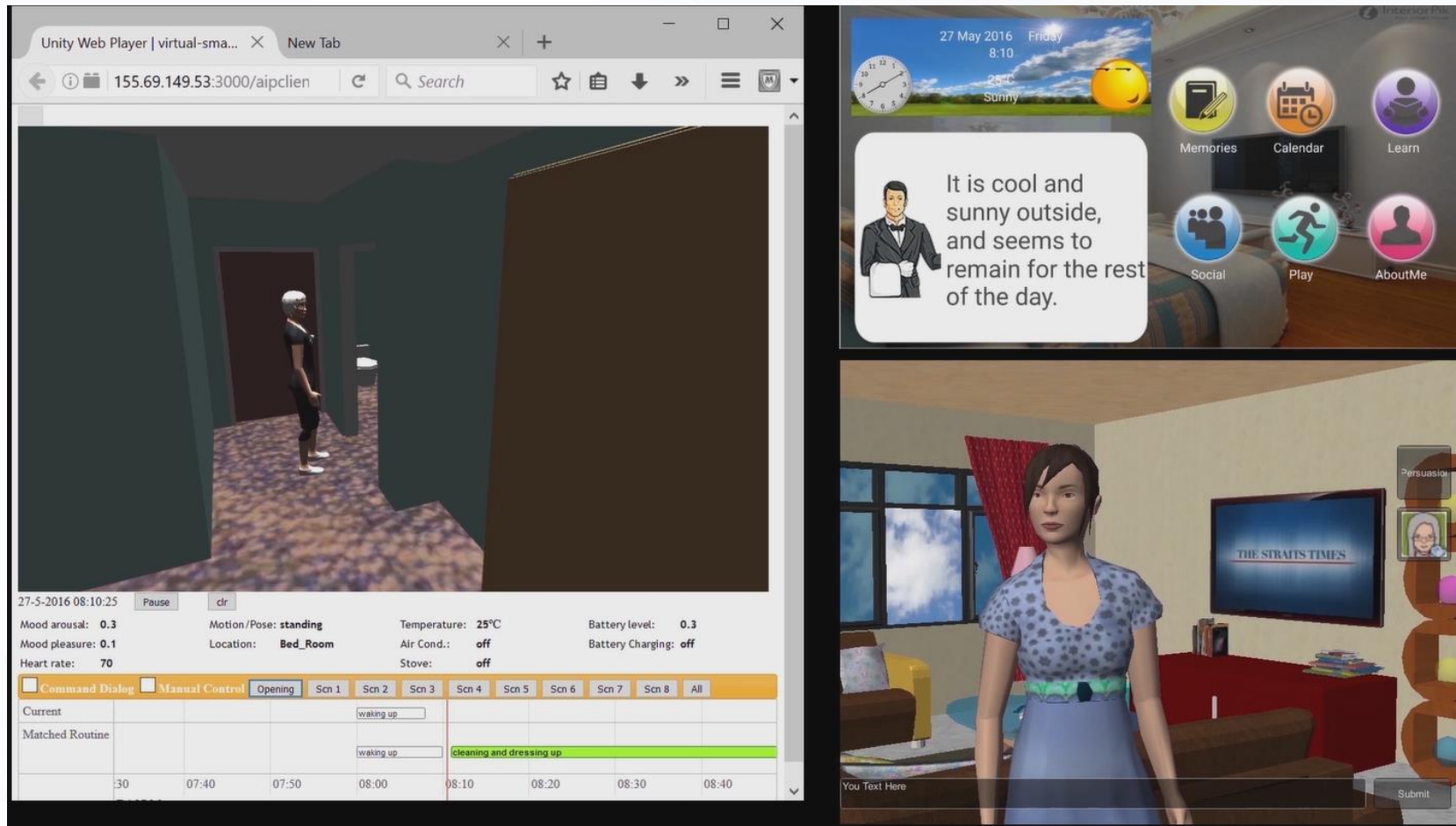
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Virtual Assistants – An Integrated Approach with Smart Home



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Virtual Assistants – Video Showcase



Unity Web Player | virtual-sma... X New Tab

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27-5-2016 08:10:25

Mood arousal: 0.3
Mood pleasure: 0.1
Heart rate: 70

Motion/Pose: standing
Location: Bed_Room

Temperature: 25°C
Air Cond.: off
Stove: off

Battery level: 0.3
Battery Charging: off

Command Dialog Manual Control

Opening Scn 1 Scn 2 Scn 3 Scn 4 Scn 5 Scn 6 Scn 7 Scn 8 All

Current

Matched Routine

30 07:40 07:50 08:00 08:10 08:20 08:30 08:40

Waking up

Waking up

Cleaning and dressing up

27 May 2016 Friday 8:10 25°C Sunny

It is cool and sunny outside, and seems to remain for the rest of the day.

Memories Calendar Learn

Social Play AboutMe

Persuasion

You Text Here

Submit

Virtual Assistants – Extension for Pillbox Fusion



Remind. Track. Connect.

An easier, smarter way to manage your medication

Pillbox Fusion (Functional Features)



Remind

Correct time and dose



Track

Simply scan pillbox to log consumption



Connect

SMS alerts to notify your family members

Talk to family members through robot

SERIOUS GAMES

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Serious Games



Ping Pong Pong Pong

Physical & Cognitive Exercises



Fun-Knee

Post-surgery Rehabilitation



Basketball Genius

Stroke Rehabilitation



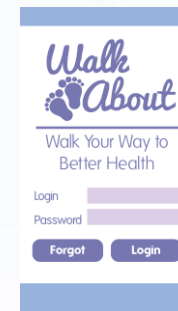
Feeding Turtle

Sports Injury Prevention



Pumpkin Garden

Parkinson's Disease Assessment and Rehabilitation



WalkAbout

AR Empowered Game for Post-operative Mobilization

Serious Games – Ping Ping Pong Pong



- A motion-based physio-cognitive sport game;
- Offers seniors an enjoyable interactive environment for physical exercise and cognitive training

Serious Games – Basketball Genius



- A personalized interactive stroke rehabilitation platform
- A tool providing medical professionals with patient's condition information

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Serious Games – Pumpkin Garden



Thank You!



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Contact:

Prof Miao Chunyan
Nanyang Technological University,
Singapore

Email: ascymiao@ntu.edu.sg

