Facilitating the Caring EmbraceMENT betWeen Generations
– Gerontechnology Design Philosophy from the Sinophone World

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THE SINOPHONE (CHINESE SPEAKING) WORLD IS AGING, FAST

• Mainland China has the world’s largest aging population.
  • Professor Du Peng from People’s University of China, convincingly argued that “getting old before getting rich” is a central feature of population ageing in China (2006).

• Satisfying the care needs of the older adults has been the primary issue.

• Taiwan, Hong Kong, Macao, and Singapore are hit simultaneously by rapid population aging and extremely low birth rate.

<table>
<thead>
<tr>
<th>2015</th>
<th>Hong Kong</th>
<th>Taiwan</th>
<th>Macao</th>
<th>Singapore</th>
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<tbody>
<tr>
<td>Crude birth rate</td>
<td>9.23 (206/224)</td>
<td>8.88 (211/224)</td>
<td>8.47 (216/224)</td>
<td>8.27 (219/224)</td>
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<tr>
<td>Fertility rate</td>
<td>1.18 (221/224)</td>
<td>1.13 (222/224)</td>
<td>0.94 (223/224)</td>
<td>0.81 (224/224)</td>
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• Traditional pattern of family support for elderly care is gradually collapsing.

LOOK INTO GERONTECHNOLOGY FOR SOLUTION
“3Gs” FOR THE AGING SOCIETY

Gerontology(12,300,000), Geriatrics(12,600,000), Gerontechnology(72,900)

• First International Congress on Gerontechnology in 1991
• International Society for Gerontechnology (ISG) in 1997

“Designing technology and environment for independent living and social participation of older persons in good health, comfort and safety”

• Scope of gerontechnology (by ISG): health, housing, mobility, communication, leisure, and work.

MEDICAL DEVICES? ASSISTIVE DEVICES?

GERONTECHNOLOGY ADDRESSES THE NEEDS OF EVERYDAY LIVES OF THE OLDER ADULTS AND THEIR CAREGIVERS
Filial piety

Still an essential element of Chinese culture shared across the Sinophone world, where children growing up are constantly and emphatically taught to be filial to their parents and respectful to their elders.

“The young kid carries the older person on the back.”
“The young kid lends an arm to support the older person.”

“THE CARING EMBRACEMENT BETWEEN THE OLDER PERSON AND THE YOUNG KID”
“To take care of the older parents, you should make them happy, and let them do what they will; help them see well, hear well, and provide them a safe and comfortable living environment.”

(Zeng, a disciple of Confucius, about 2,500 years ago)
One day when Zeng was out cutting wood among the mountains, there came a visitor to his house. After awaiting her son’s return in vein, his mother bit her finger.

Zeng felt heartache all of a sudden and knew there was an emergency. He rushed back home with a burden of wood, and on arrival, knelt down to asked his mother what happened. His mother replied, “Here is a visitor who needs you urgently. So I bit my finger to awake you to come back…”

From the “24 stories of filial piety”

THE BEGINNING OF TELEHEALTH…
HOME TELEHEALTH SYSTEM (TeleHealthSolutions)
PROF. BRANKO CELLER, AUSTRALIA
10 YEARS AFTER THE MAJOR “UBIQUITOUS CARE” PROJECT, HOME TELEHEALTH PROVED TO BE A FAILURE IN TAIWAN...

- More than 40 home telehealth projects were sponsored by the government in Taiwan from 2006~2011, very few survived after government funding ended.

WHO ARE MISSING IN THE PICTURES?
Wearable Devices?

Are you wearing a wearable device? Why and why not?
SMART HOME / SMART LIVING?

• CHT Smart Home
  • Service controller, wireless gas detector, wireless motion detector, wireless smart plug, wireless temperature/humidity sensor, wireless smoke detector, wireless reed switch, wireless IP camera, wireless remote controller

• SERCOMM Smart Home Control

ARE THEY REALLY SELLING “LIVING”?
DO YOU HAVE A ROBOT @ HOME?

- iRobot
- Sony QRIO
- Honda ASIMO
- Paro, about USD 5,000

Robot @ Home!

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What do you see in these photos?
GERONTECHNOLOGY IS MORE ABOUT DESIGN

- 老( old) = 弱(frail)、病(ill)、残(disable)、窮(poor)？
- “Need” may not necessarily turns into “motivation”
- Older adults may have strong need for home telehealth systems, but very little motivation of using them…

“Enjoyment as a source of life”, more fun than functions!

Facilitating the caring embracement between generations

A telepresence robot that expresses emotion
HOW IF THE VITAL SIGN MEASUREMENTS OF THE OLDER ADULTS ARE SENT TO CHILDREN AND FAMILY MEMBERS?

CARE, INTERACTION, CONNECTION, IN ADDITION TO HEALTH MONITORING
**Whiz Series: Put “Smart” into “Living”**

- Transform artifacts familiar to the older adults into Internet of Things (IoT)
- Physical world ↔ digital world

SMART INTO LIVING

- Transformed artifacts:
  - WhizTOYs
  - WhizMAT
  - WhizCARPET
  - WhizTouch
  - WhizPAD
  - WhizLight
  - WhizLocater
  - WhizCHAIR/WhizSEAT
  - WhizRemote
  - WhizSensor

MQTT Broker → Cloud Server → Wifi (AP)
GERONTECHNOLOGY IS ONLY VALUABLE IF RESEARCH CAN BE TURNED INTO PRODUCT...

Seda G-Tech WhizSeries Smart living / IoT/ Gerontechnology

WhizPAD is an extremely comfortable mattress capable of motion sensing.

Motion-sensing Mattress
**Localization: Fundamental Technology for Smart Living**

- Image processing, wearable device, floor sensors
- *WhizCarpet*: DIY assembly, flexibility in size, location and area
- Automatically mapping
- Real time tracking from mobile device
- Possible applications: localization, mobility monitoring, fall detection, fall protection, leave bed alarm, rehabilitation, games…
JULUNG APARTMENT FOR THE ELDERLY
FRACTAL D FROM MOVEMENT PATH MEASURED BY WhizCARPET

• Wandering behaviors of dementia patients: MS model


• Fractal D for describing movement paths of wanderers

Wandering behaviors captured by WhizCARPET

Direct travel

Pacing travel

Lapping travel

Random travel
DEMENTIA IoT BEDROOM

WhizPad

WhizLight

Mi band

Tablet

WhizCarpet

Personalized information
DESIGN REHABILITATION INTO INTERACTIVE GAMES
BANQIAO VETERAN DEMENTIA HOME
LEARNING MORE ABOUT GERONTECHNOLOGY
FACING REAL WORLD PROBLEMS

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