GERONTECHNOLOGY – OPPORTUNITIES AND CHALLENGES

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2017/06/27
THE SINOPHONE (CHINESE SPEAKING) WORLD IS AGING, FAST

• Mainland China has the world’s largest aging population.
• Taiwan, Hong Kong, Macao, and Singapore are hit simultaneously by rapid population aging and extremely low birth rate.

<table>
<thead>
<tr>
<th>Year</th>
<th>Hong Kong</th>
<th>Taiwan</th>
<th>Macao</th>
<th>Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>Crude birth rate</td>
<td>9.23 (206/224)</td>
<td>8.88 (211/224)</td>
<td>8.47 (216/224)</td>
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<tr>
<td></td>
<td>Fertility rate</td>
<td>1.18 (221/224)</td>
<td>1.13 (222/224)</td>
<td>0.94 (223/224)</td>
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• LOOK INTO GERONTECHNOLOGY as a positive solution in maximizing the efficiency and effectiveness of manpower and resource in elderly care.
“3Gs” FOR THE AGING SOCIETY

Gerontology \((7,270,000)\), Geriatrics \((9,200,000)\), Gerontotechnology \((74,000)\)

- First International Congress on Gerontotechnology in 1991
- International Society for Gerontotechnology (ISG) in 1997

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

- Scope of gerontotechnology: health, housing, mobility, communication, leisure, and work.

- Gerontotechnology Research Center Yuan Ze University was established in January 2003, the pioneering research center in the field of gerontotechnology in Taiwan.
ICT in healthcare: Home Telehealth

• 10 years after the major “Ubiquitous Care” project, home telehealth proved to be a failure in Taiwan…

WHO ARE MISSING IN THE PICTURES?

TeleHealth Solutions
Prof. Branko Celler, Australia

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If the vital sign measurements are sent to children, family members, rather than medical doctors?

Care, interaction, connection, in addition to health monitoring.
Are you wearing these wearable devices?

Google Glass

Nike FuelBand

Microsoft Smartwatch

Samsung Gear Fit

Intel Smartshirt

Sony SmartBand

Whistle Activity Monitor for dogs

Mi Band

One More Thing – Apple Watch

Mi Band
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 – World’s Most Therapeutic Robot certified by Guinness World Records available for lease for $200 per month, or can be bought outright for $6000

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

Technologies used at home: mobile device, social network, IoT…

• Gerontechnology is only valuable if the designs can be turned into products.

Creativity ➔ Prototype ➔ Products ➔ Sales
• Put “smart” into “living”: Transform artifacts commonly seen in everyday lives into Internet of Things (IoT)
Centered around the bedroom: \textit{WhizPad} is a very comfortable mattress capable of motion sensing

- Special foam to reduce the risk of bed ulcer
- Leave bed alarm in 3 stages to reduce risk of fall
- In-bed activity / sleep quality monitoring
**Localization: Fundamental Technology for Smart Living**

- Image processing, wearable device, floor sensors
- **WhizCarpet**: DIY assembly, flexibility in size, location and area
- Automatic mapping, real time location tracking from mobile devices

- Localization, mobility monitoring, fall detection, fall protection, leave bed alarm, rehabilitation, games…
JULUNG APARTMENT FOR OLDER ADULTS
**WhizTouch: Two-way IoT Call Button in the Form of a Bed Light**

- **IoT LED Light**
  - Set up and adjust through mobile phone App
  - Machine 2 Machine control with WhizPad
- **Two-way IoT call button**
  - Caregiver receives call from mobile phone
  - Light changes from red to green when caregiver responds
**WhizLocator: Localization using BLE devices**

- **Location info.**
- **Alert messages**
- **Simple registration and set up**

Put BLE receivers on desired locations and connect to Wi-Fi.

If the older adult is willing to wear a BLE device, such as Mi Band.
Physical exercise / cognitive training / multi-sensory stimulations

Basketball

Pinwheel

WhizToys
Banciao Dementia Nursing Home

- Old Days
- Life Tree
- Music Corner
- Train Station
- Old Theater
- Interactive Wall
- Activity Room
REAL WORLD EXPERIENCE, TRANSDISCIPLINARY LEARNING

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