

Persuasive technologies for Older Adults to Increase Physical Activities

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One Day Workshop (UCL)
Using technology to help older
adults be physically active

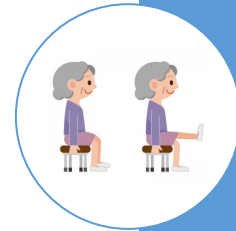


News release of my Latest
research work on the impact
of environment on Health



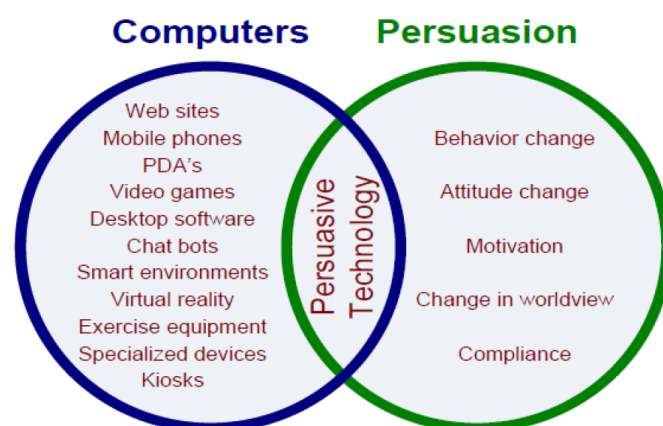
Overview

- Persuasive Technologies
- Persuasive Technologies for older people
- IoT for PA
 - NFC
 - Beacons
- Data Science for understanding the impact of Technology on PA
- PA based on handgrip
- Analysis of Prayers as effective PA



Persuasive Technology

Persuasive technology is broadly defined as **technology** that is designed to change attitudes or behaviors of the users through **persuasion**



Technology

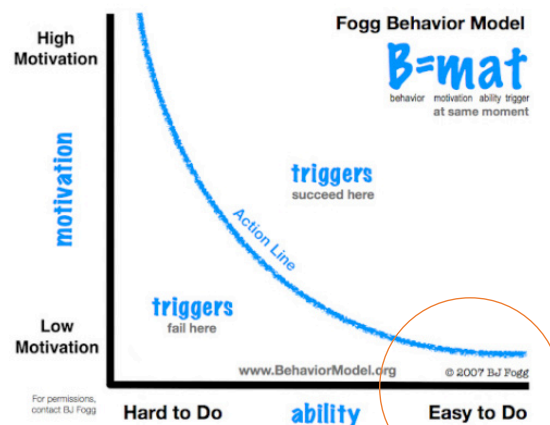
Technology can be a more powerful, efficient force to engage and persuade us, drawing on the following strengths:

1. **Interactivity:** more than a printed message, interactive technology can achieve more engagement from users
2. **Intelligence:** by collecting and storing a huge amount of data, we can create more customised communication
3. **Connectivity:** technology can create global communities, drawing people from all around the world together
4. **Diffusion:** as we are constantly in touch with technology, it is a persistent force that jumps into our lives in the best, emotional moments



Behaviour Model

The Fogg Behavior Model shows that **three elements must converge at the same moment** for a behavior to occur: **Motivation, Ability, and Trigger**. When a behavior does not occur, at least one of those three elements is missing.



<http://www.behaviormodel.org/>



Persuasive Technologies

The emerging field of persuasive technology has enormous potential for promoting physical activity and healthy behaviors (Fogg and Eckles 2007; Zhu 2008).



Smart Phones Apps are
the main technological
tools to help Increase
Physical Activities





Many older adults find it hard to follow instruction and read small text on Smart Phones



Pervasive Technology Characteristic for Seniors

Trigger/Reminders

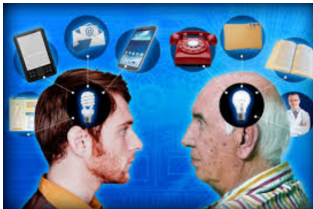
Easy of Use

Availability

Reachable

Easy to get rid of

....



IoT? Can we use it to increase physical activities for Seniors

NFC (Near Field Communications)

Near Field Communication is a method of wireless data transfer that detects and then enables technology in close proximity to communicate with each other.



- To Unlock mobile content
- NFC around the house or hospital
- On-Body NFC

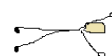
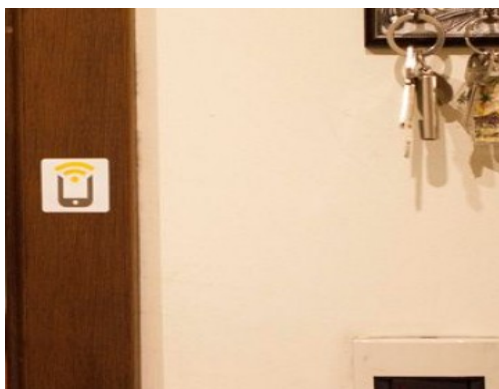


Near Field Communication (NFC) tag embedded in the bag.

The PBX bag tags are loaded with exercises that can be tried with the kit. When the user holds their smartphone over the tag, the information uploads so they can see the recommended range of exercises.



NFC Everywhere



Or even in Smart Clothing to enabling systematic workout

Redefining smart Clothing with RFID-NFC

The idea of smart clothing may be fairly new, but the fact is that fashion and electronics have been paired up for some time, as part of the supply chain. Radio Frequency Identification (RFID), which can be read by a special reader device over a distance of a few meters, is already used to improve logistics, drive fulfillment, and make inventory more precise, with accuracy rates of up to 99%. Now, as RFID tags have made their way into fashion items – in the form of a paper hang tag, a textile tag stitched into a collar, a button on a sleeve, or a durable tag pressed into the sole of a shoe – they're letting fashion items interact with anyone, including consumers.

<https://blog.nxp.com/portable-wearable/smart-clothing-iot-wearables>

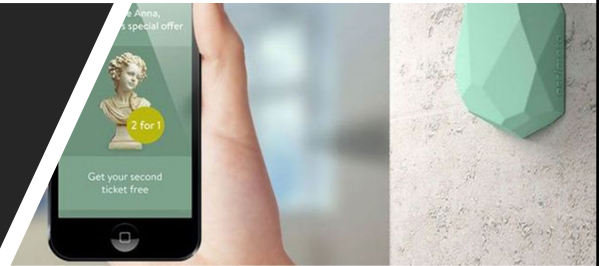
NFC for consistent Chair exercises

Exercising while seated in a chair can help mobility impaired or wheelchair bound seniors improve their mobility and can also be used as a warm up for individuals with greater mobility.



Physical Computing: Beacons

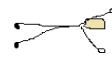
- **Bluetooth beacons** are hardware transmitters - a class of Bluetooth low energy (LE) devices that broadcast their identifier to nearby portable electronic devices. The technology enables smartphones, tablets and other devices to perform actions when in close proximity to a beacon.
- iBeacon introduced by Apple in 2013 to enable retail/location based payment.
- Then few versions of Beacons have followed.
- **Eddystone** is a Google's standard for Bluetooth beacons (released by Google in July 2015).



<http://www.travelonart.com/new-media/che-cosa-sono-i-beacons/>

Beacons

- The beacon information available includes battery voltage, beacon temperature, number of packets sent since last startup, and beacon uptime.
- Many Eddystone beacons have sensors (such as motion sensor, temperature, humidity), internal memory, longlife battery, some have NFC chips in them.



Why Beacons

Ideal for **promoting** physical activity in those with little intrinsic motivation for exercise

Can be placed anywhere, school, shopping malls, hospitals, parks and gardens

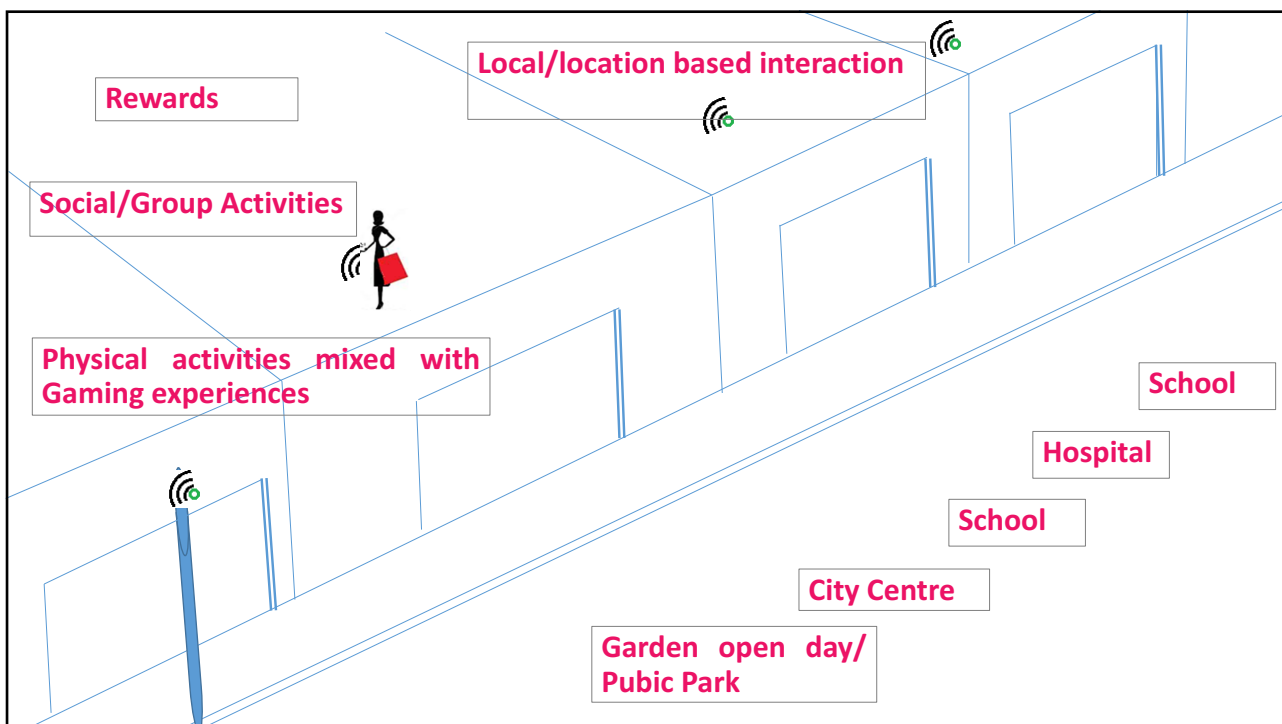
Can enable social and group interaction

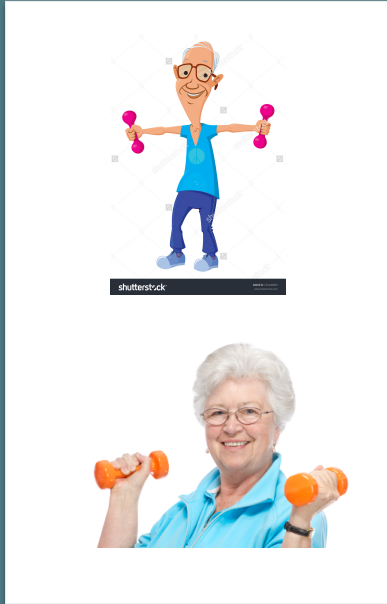
Can track location indoor

Rewards can be given for those who finds them



<http://tech.co/real-world-beacon-technology-2015-11>





Embedded Accelerometer for mild Weight Training

Physical Exercises(Programs) for Rehabilitation Intervention : e.g. Pulmonary rehabilitation

- Usually patients are prescribed a strict programme over few weeks with daily exercises.

Data Science and AI for Physical Activities

- Data Science can help in two directions:
 - Performing all data collection and processing in the background
 - Understanding the benefit and the impact of Various types of physical excersises



It's not all about Walking: Older Adult still can exercise while sitting

Squeezing your way to lower blood pressure. A simple hand exercise can help you lower your blood pressure without drugs.

They had taken part in a range of exercise programmes included squeezing, pinching and rolling therapeutic putty, squeezing hand exercise balls and pulling against resistance bands.



http://www.health.harvard.edu/newsletter_article/squeezing-your-way-to-lower-blood-pressure



