iHome for smart elderly

April 4 2012, By Wilfred Lai

Credit: Hong Kong PolyU

The first smart home, "iHome", has newly opened in Yau Ma Tei in Hong Kong revealing the future of home care for the elderly. Established by PolyU in collaboration with the Hong Kong Housing Society and the Hong Kong Applied Science and Technology Research Institute with the support from Innovation and Technology Commission, iHome is a high-tech elderly resources centre featuring smart innovations that support independent living. As age takes its toll, we may experience lose of health, physical ability and independence, that leads to inconvenience and discomfort in our daily lives. Smart healthcare technology designed by PolyU allows people to age well by keeping them at home, safe and comfortable, despite mental and physical limitations.

The 400-square-foot model home consists of a living room, a bedroom, a kitchen and a bathroom, fully furnished and well connected with a

computer-controlled network of sensors for health monitoring and home automations to help with basic tasks in daily living. For instance, paraplegic can now dim the lights and turn on the TV for a movie with a touch of button without asking for help. That will give people with severe disability tremendous freedom and ability to take better control of their own daily lives.

In the spotlight is an array of information and communication technologies from Telecare that coordinates health-monitoring and alerting functions. For example, advanced motion sensors are adopted to track movements and activities of daily living. Mobile healthcare sensors in forms wrist and ear-born bands keep vital signs in check, including pulse rates and motion data. Information such as bathroom visits and activity levels will be sent back to a computer at the residence which does the analysis and can send alerts to smart phones and service centre when a fall happens or when abnormal pulse rate is detected.

Family members, trusted friends and physicians can now look after aging people from anywhere. The real-time monitoring provided by Telecare system gives greater visibility in terms of physical location and health status when compared with occasional visits. The information gathered also reveals changes in living patterns that may indicate emerging health problems and provide the opportunity for early treatment. One of the principal investigators, Dr. Raymond Tong from PolyU's Interdisciplinary Division of Biomedical Engineering said, "Family members will have a peace of mind when seeing their elderly relative safe and well while the elderly themselves will also feel secure in their own homes knowing help is readily available."

Designed with people's comfort and privacy concern in mind, Telecare monitoring is made non-invasive and non-intrusive. Round-the-clock health watch is done without a single wire or electrode on the person and also cuts out the need to wake up the person in sleep for measurements.

Freedom is guaranteed with in-home monitoring done by sensors, not by video. Caregivers can be aware of what is happening without interfering the daily routine of the elderly. For example, when the elderly people use the smart remote controller and smart stick which are embedded with pulse and motion sensors, their pulse and activity information is automatically and silently obtained and is then transmitted wirelessly for analysis.

To most elderly people, hospitals or nursing homes are the last resort as they would rather stay and age in the comfort of their own homes. The other key researcher Professor Zheng Yongping also from the Interdisciplinary Division of Biomedical Engineering commented, "Carer is not always the best option. It is a difficult and demanding job to look after elderly people, and committed and caring service is hard to find. Therefore, home automation and health monitoring is definitely the way forward to make elderly people live independently."

Another research team member Dr. Eric Tam Wing-cheung from the Interdisciplinary Division of Biomedical Engineering said, "The opening of iHome is a clear expression of our commitment to this important aspect of elderly care research, which leverages our unique expertise in healthcare, biomedical engineering and product design."

iHome project is a concerted effort of experts from multi-discipline. The design team led by Prof. Tak-chi Lee from PolyU's School of Design has also contributed their expertise by innovatively integrating the healthcare sensing and home automation into the iHome apartment.

Provided by The Hong Kong Polytechnic University