

Chapter 7

Sensors for Smart Homes

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ABSTRACT

Sensors are increasingly being employed to determine different activities of a person living at home. Numerous sensors can be used to obtain a variety of information. While many sensors may be used to make a system, it is important to look into the availability, cost, installation, mechanism, and performance of sensors. This chapter investigates different sensors and their usefulness in a smart home monitoring system. A smart home monitoring system provides a safe, sound, and secure living environment for elderly people. Statistics show that the population of elderly people is increasing around the world and this trend is not going to change in the near future. The authors have developed a smart home that consists of an optimum number of wireless sensors that includes current flow, water flow, and bed usage sensors. The sensors provide information that can be used for monitoring elderly people by detecting abnormal patterns in their daily activities. The system generates and sends an early warning message to the caregiver when an unforeseen abnormal condition occurs.

1. INTRODUCTION

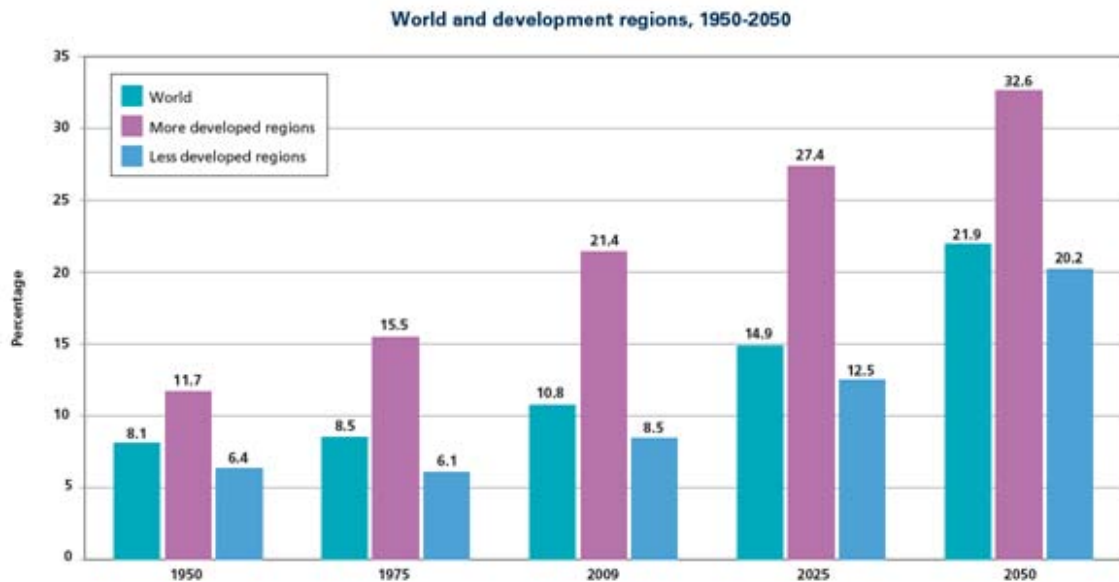
Recent statistics indicate that the population that is 60 years or older is steadily on the rise throughout the world as is shown in Figure 1. It is estimated that by 2050 this particular group will have globally increased by over 50% (DESA, 2007). There are many people in our community who because

of age or some infirmity, or perhaps because their memory and judgment can no longer be totally relied upon, are having pressure put on them to leave their home and give up their precious independence.

Over the past century, the average life expectancy of humans has increased and has almost doubled. The maximum life span—the longest

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Figure 1. Estimates and projections for the population aged 60 and over (Bryant, 2008)

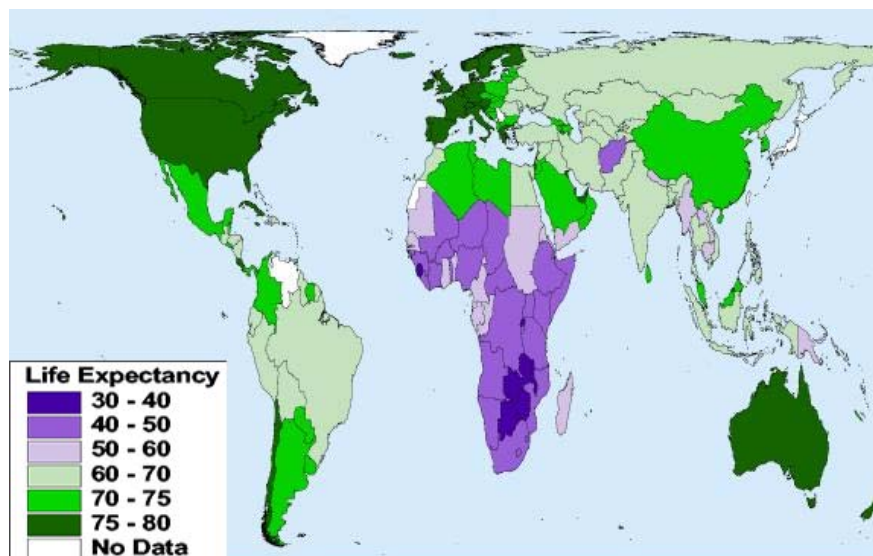


number of years a human being has lived—has also increased spectacularly as shown in Figure 2.

Increased life expectancy can cause an immense stress on the scarce resources available to care for the elderly. Therefore the importance of

enabling the elderly to live in their own home as long as possible is crucial. However, if they prefer to live alone they do require constant monitoring so that medical help can be provided immediately in times of dire needs. The smart home concept is a promising way to improve the living

Figure 2. Life expectancy around the world (UCSC, 2010)



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