

Chapter 14

Appreciations for the Role of Sensors in Everyday Life Against the Aging Population

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ABSTRACT

The focus of this chapter is on the sensor within an aging population. The study involves a detailed analysis of applications with sensors and the effects of their use in the basic sectors of society, such as economic, educational, medical, social security system, social, and cultural activities. After a faithful presentation of the notion of sensor, the work makes a foray into contemporary technical history starting with the appearance of sensors, selects and appreciates some characteristic and edifying parameters of daily life from the beginning of the period of using the sensors; these parameters refer to living standards, health standards, mortality rates, life expectancy, birth rate, occupations by sex and age, educational level of individuals, employment, degree of development of a professions, the interest of the population for a certain type of product, and the tendency to use modern equipment by fields of activity by geographical areas.

INTRODUCTION

The word sensor is related to the Latin term “sensus” which translates sense; before being included in the technical terms it was and is used in describing the abilities of human sense organs and living organisms to collect, process information from the environment and transmit it to the brain. The biological model is found in mechatronic systems, thus necessitating the enumeration of sensory biological systems:

1. **Sight** is a demanding and important sensory biological function, which brings a predominant influx of information with a transfer rate of approximately 3,106 bits / s. This contributes in most cases to the investigation of the environment by identifying objects, their configuration, their position, their orientation and the appreciation of distances. In humans, the visual sense is highly developed,

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to the detriment of other biological investigation sensors (such as ultrasonic) that we find in some living species, such as bats, dolphins, whales, etc.

The function of the eye sums up a series of activities of the component elements within the visual section: taking the image on the retina, transmitting it to the brain, a succession of intelligent adjustments through the optical muscles, lens and iris, processing and compression of transmitted data.

2. **Hearing** allows beings to receive sound waves from the specific “audio” domain; in humans it is between 16 Hz and 16 kHz. The rate of transferring auditory information is 2,104 bits / s. This sense is the basis of communication, determining the investigation of space by receiving sounds, supervising daily processes with the help of signals from sound sources, which can be ordinary signals or warning systems.
3. **Skin sensitivity** is conferred by receptors implanted in the skin, distinguishing several forms, as follows: tactile, thermal and painful sensitivity, which are not evenly spread on the skin surface; the tactile one is developed on the skin on the flying face of the fingertips, and the thermal one is more accentuated on the dorsal face of the hand where there is also a greater painful sensitivity.
4. **The taste** has a transfer rate of taste information of 10 bits / s (Dumitriu, 2006, pp. 95-97)

The senses are characteristic of man and living things for carrying out the activities imposed by life, but our age has witnessed the endowment of devices, machines, objects and equipment with these „sense“ which are called sensors; they practically meet everywhere. In the following it try a raid as detailed as possible in the path taken by the “technical” sensor during its evolution to the present day.

The „technical” sensor is an element for converting a physical (non-electrical) quantity, which characterizes the environment, into an electrical signal that can be quantified at a measuring device, indicator or recorder; is a device that receives and reacts to a stimulus - the principle of the sensor.

SENSOR EVOLUTION

A relevant evolution of the measuring devices is outlined starting with the end of the 18th century with the appearance of the equipped mechanical measuring instruments, continuing with the appearance of the electrical sensitive systems from the beginning of the 20th century; the ‘70s represent the reference point of the road traveled by research and applications with sensors.

The development of microelectronics introduces in the specialized literature the term “sensor” together with other technical terms of revolution, such as: microprocessor, microcontroller, transputer, actuator etc. Gradually, sensors have found their place in all areas of our daily lives. Mechatronics develops with the advent of digital computers, causing the emergence of industrial robots, walkers, microprocessors and PCs; Microelectronic Mechanical Systems (MEMS) appear as a support for all instruments based on micro and Nanoelectromechanical systems (NEMS). In parallel with microelectronics, optoelectronics is developing, which develops holograms with fiber-optic endoscopes, laser generators, image sensors. By applying the elements of optoelectronics within the appropriate mechatronic systems, optomechatronics is progressively developed.

Applications of research results within these branches that have common roots are found in our daily activities; starting with the indispensable mobile phone which, as things evolve, becomes included in

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