Physiotherapy smart connected devices for S-health

Publisher: IEEE

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Abstract

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Connected healthcare devices, including medical equipments as well as personal health devices based on emerging mobile technologies used by healthcare providers and consumers, are expanding traditional means of practicing healthcare particularly physiotherapy services. We describe a system based on physiotherapy smart connected devices, as smart walker, smart crutches, force platform and natural user interface devices - characterized by different sensing technologies including piezorezistive force sensors and microwave radars. The information from the physiotherapy connected devices is stored and shared based on client-server architecture. Signals and metrics that combine the data from connected devices and serious games associated with physical rehabilitation are presented in the paper.

Published in: 2016 7th International Conference on Information, Intelligence, Systems & Applications (IISA)

Date of Conference: 13-15 July 2016

INSPEC Accession Number: 16544088

Date Added to IEEE *Xplore*: 19 December 2016

DOI: 10.1109/IISA.2016.7785336

Publisher: IEEE

ISBN Information:

Conference Location: Chalkidiki, Greece

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I. Introduction

In many countries the increasing percentage of the population living in the cities and of elderly population are the main socio-demographic trends. By 2050, about 70 percent of the world's population is expected to reside in urban areas [1] and around 22% of the population will be over 60 years old [2]. These trends make necessary to integrate new technologies and innovative solutions that respond to new environmental, social and healthcare challenges, in order to offer new services that may optimize the quality of life in cities. The latest developments in the sensors networks and cloud technology are providing solutions that can transform our cities into more connected, sustainable and collaborative environments. Medical devices had the largest year-over-year increase, in the last five years, around 27 percents, and all of its subsectors had double digit growth. These recent advances in technology expand the traditional means of practicing healthcare through the smart connected healthcare systems that can significantly improve the physiotherapy diagnostic, health condition management and treatment. These technologies are designed to provide better physiotherapist-patient communication, deliver more efficient care and enable remote patient monitoring and independent living solutions.

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