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**ABSTRACT**

Internet of Things (IoT) is a computing

process, where each physical object is equipped with

sensors, microcontrollers and transceivers for empowering

communication and is built with suitable protocol stacks which

help them interacting with each other and communicating

with the users. In IoT based healthcare, diverse distributed

devices aggregate, analyse and communicate real time medical

information to the cloud, thus making it possible to collect,

store and analyse the large amount of data in several new

forms and activate context based alarms. This novel information

acquisition paradigm allows continuous and ubiquitous medical

information access from any connected device over the Internet.

As each one of the devices used in IoT are limited in battery

power, it is optimal to minimise the power consumption to

enhance the life of the healthcare system. This work explains

the implementation of an IoT based In-hospital healthcare

system using ZigBee mesh protocol. The healthcare system

implementation can periodically monitor the physiological

parameters of the In-hospital patients. Thus, IoT empowered

devices simultaneously enhance the quality of care with regular

monitoring and reduce the cost of care and actively engage in

data collection and analysis of the same.

The shape and material complexities allowed by Additive Manufacturing have favoured a new research trend coined as 4D printing, and which is about Additive Manufacturing of Smart Materials. While the manufacturing aspect of 4D Printing has been intensively investigated, a little has been done to empower designers so that they can efficiently tackle design problems solvable by this new emerging technology.

A 4D Printing design problem is ways more complex than a conventional one in that, it involves designing a change strategy consistent with the desired functionality, designing a structure which is additively manufactural, and which is made (partially or not) of stimulus responsive Smart Materials.

The paper is a contribution is made towards this latter aspect of 4DP. Smart materials are extensively researched, especially as regards syntheses, characterization, constitutive behaviour modelling, etc. As such their physical fundamentals are well understood, however using them by non-experts is still challenging. After a brief review of 4DP and the Smart Materials realm, and an outline of what designers may need, a platform allowing designers to rapidly explore the design space around SMs in a physically realistic way and on a voxel, basis is proposed. It is shown how such platform can expedite the design process with Smart Materials.

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