

Internet of Things

Developing an optimal wireless power transfer
system for a real-world low power LED wristband
application

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October 27, 2013

Abstract

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Keywords: Wireless power transfer, low power, real-world application

1 Introduction

introduction

2 Related work

related

3 Prior knowledge

prior

4 Description of the proposed idea

decription idea

4.1 Working towards a realization

realization

4.2 Protocols concerning environmental impact features

The major goal of this report is to be able to develop a real-world application. In order to do this, all real-world implications need to be taken into consideration. Scenario's were developed to develop a charging protocol that accounts for all possible states. For these scenarios a user wearing a tranceiver wristband is considered. Other viewpoints for a scenario can be the user wearing a receiving wristband or the transmitting bar. However, these viewpoints are considerably easier to address and will implements parts of the protocol designed for a tranceiving system.

There are certain states in which the system can reside depending on its own battery state, the battery state of neighbour nodes and the availability of a charging bar. These states and their transmissions are displayer in figure 1. It can either be sufficiently full defined as V_{full} , starving defined as V_{starve} or dead which is defined by V_{dead} . These parameters are further specified in section 5.

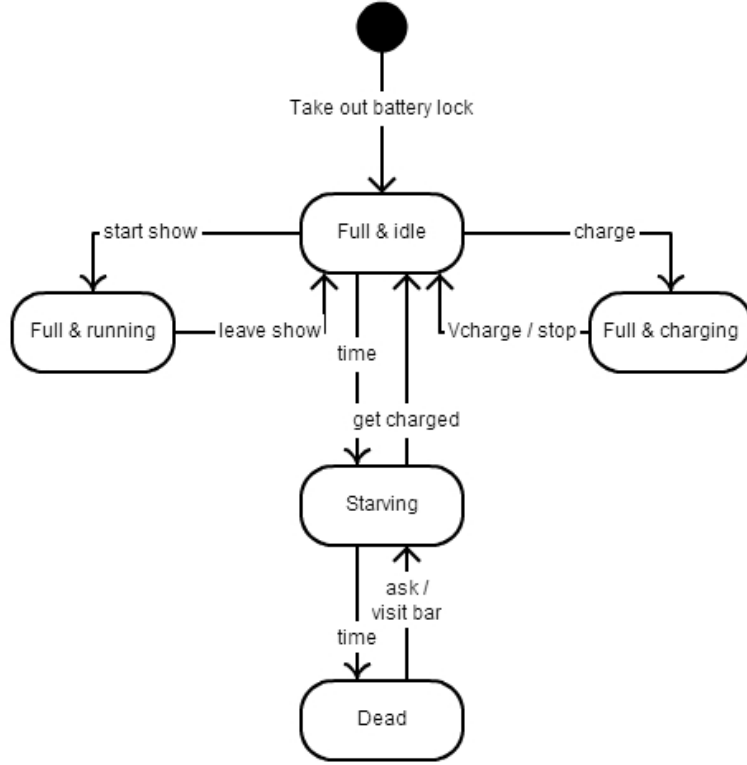


Figure 1: State diagram of a transceiving wireless power transfer system

A charging protocol has to be designed to account for these combinations. We considered three possibilities: an infinite network like design, a hop-to-hop spread of energy or an interactive behavior to selectively share energy. To stimulate interaction through this application we choose to apply a scenario where a user can choose to act upon energy requests and share with friends, or strangers.

To handle these protocols, an IC has to be added. This way whenever the battery reached V_{starve} it will send out a request for energy visually by lighting a red LED embedded in the wristband. Neighbouring nodes can then choose to react on this or save their own energy. Whenever the battery dies, the user either has to verbally ask for energy or visit an energy bar.

5 The proposed system design

proposed ideas

5.1 The internet of things

The assignment of this report conveyed critizing and accessing system-level Internet of Things components in scientific literature. Because the assigned paper did not include anything IoT related, we will present our own idea. In this section we will provide a short introduction to the Internet of Things and its key features, present our idea and focus on the practicality and entrepreneurial aspect of the idea.

The Internet of Things refers to uniquely identifiable objects, or things, and their virtual representations in an Internet-like structure. [ADD REF]. The intelligent application is the key feature here. Important aspects to be taken into consideration when designing such a system are security, privacy and scalability.

The anatomy of Internet of Things is initiated by a certain event, that is detected and logged by devices that include self-properties [ADD REF]. This data is then uploaded by a ubiquitous and interoperable network. The unique feature of the internet of things is that this system is smart and can generate knowledge and by analyzing this data and understands the system. Certain events are then triggered and reported as response. The intelligence of these systems lie in the adapting mechanisms that analyse and understand the environment in order to deal with the complex dynamics of a real-world environment.

6 Results

results

7 Conclusion

conclusion

References