



CISTER

Research Centre in
Real-Time & Embedded
Computing Systems

Poster

Low Cost IOT system for Residential Automation using Open Hardware and Open Software with a Focus on Disabilities

Felipe Oliveira Prado

Joiro Gomes da Silva Neto

Ênio Filho*

*CISTER Research Centre

CISTER-TR-190608

2019/06/27

Low Cost IOT system for Residential Automation using Open Hardware and Open Software with a Focus on Disabilities

Felipe Oliveira Prado, Joiro Gomes da Silva Neto, Ênio Filho*

*CISTER Research Centre

Polytechnic Institute of Porto (ISEP P.Porto)

Rua Dr. António Bernardino de Almeida, 431

4200-072 Porto

Portugal

Tel.: +351.22.8340509, Fax: +351.22.8321159

E-mail: enpvf@isep.ipp.pt

<https://www.cister-labs.pt>

Abstract

The quest for comfort and practicality is commonplace in contemporary society, but such benefits are still not offered satisfactorily to all. Among these, special attention is given to people with Disabilities, who often do not enjoy the latest technologies in applications and automated systems because they do not have their needs covered by these technologies (Domingo 2012). The aim of this work was to develop an automation system that would increase the level of inclusion. This work also proposes a low cost residential automated system, developed using electronic waste, open hardware and open software, to increase the application of the system. There were used platforms of easy access, and easy replication, aiming at the dissemination of technology (Trihinas, Pallis, and Dikaiakos 2018). Among these platforms, it is possible to highlight the Google Assistant (Chatterjee, n.d.). All the platforms used help the development of an Internet of Things (IOT) system, with multiple capabilities. Finally, functional tests were performed of three physical modules to control a door, a set of sockets and some lamps, using RFID, cellular and voice cards for its activation.

Low Cost IOT system for Residential Automation using Open Hardware and Open Software with a Focus on Disabilities

Felipe Oliveira Prado¹, Jairo Gomes da Silva Neto¹,
Ênio Vasconcelos Filho²

¹Departamento de Eletrotécnica, Instituto Federal de Goiás, R. 75, 46, St. Central, Goiânia - GO, 74055-110, Brasil aculdade de Engenharia Mecânica, Universidade de Brasília, UnB - Brasília, DF, 70910-900, Brasil (flprado01@gmail.com) (jairo077@gmail.com)

²Cister – Research Centre in Real-time & Embedded Computing Systems, Instituto Superior de Engenharia do Porto, Rua Alfredo Allen 535, 4200-135 Porto, Portugal; Departamento de Eletrotécnica, Instituto Federal de Goiás, R. 75, 46, St. Central, Goiânia - GO, 74055-110, Brasil (enpvf@isep.ipp.pt) ORCID [0000-0001-5459-6821](https://orcid.org/0000-0001-5459-6821)

Abstract

The quest for comfort and practicality is commonplace in contemporary society, but such benefits are still not offered satisfactorily to all. Among these, special attention is given to people with Disabilities, who often do not enjoy the latest technologies in applications and automated systems because they do not have their needs covered by these technologies (Domingo 2012). The aim of this work was to develop an automation system that would increase the level of inclusion. This work also proposes a low cost residential automated system, developed using electronic waste, open hardware and open software, to increase the application of the system. There were used platforms of easy access, and easy replication, aiming at the dissemination of technology (Trihinas, Pallis, and Dikaiakos 2018). Among these platforms, it is possible to highlight the Google Assistant (Chatterjee, n.d.). All the platforms used helps the development of an Internet of Things (IOT) system, with multiple capabilities. Finally, functional tests were performed of three physical modules to control a door, a set of sockets and some lamps, using RFID, cellular and voice cards for its activation.

This work was partially supported by National Funds through FCT/MCTES (Portuguese Foundation for Science and Technology), within the CISTER Research Unit (UID/CEC/04234).

Author Keywords. Residential Automation, Disabilities, Internet of Things, Microcontrollers, Low-Cost.

References

- Chatterjee, Anjan. n.d. "Artificial Intelligence Based IoT Automation: Controlling Devices with Google and Facebook" 05 (04): 6.
- Domingo, Mari Carmen. 2012. "An Overview of the Internet of Things for People with Disabilities." *Journal of Network and Computer Applications* 35 (2): 584–96. <https://doi.org/10.1016/j.jnca.2011.10.015>.
- Trihinas, Demetris, George Pallis, and Marios Dikaiakos. 2018. "Low-Cost Adaptive Monitoring Techniques for the Internet of Things." *IEEE Transactions on Services Computing*, 1–1. <https://doi.org/10.1109/TSC.2018.2808956>.