

Dario Fernando Cortes Tobar
Vo Hoang Duy
Tran Trong Dao *Editors*

AETA 2019 – Recent Advances in Electrical Engineering and Related Sciences: Theory and Application

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This proceedings book features selected papers on 12 themes, including telecommunication, power systems, digital signal processing, robotics, control systems, renewable energy, power electronics, soft computing and more. Covering topics such as optoelectronic oscillator at S-band and C-band for 5G telecommunications, neural networks identification of eleven types of faults in high voltage transmission lines, cyber-attack mitigation on smart low voltage distribution grids, optimum load of a piezoelectric-based energy harvester, the papers present interesting ideas and state-of-the-art overviews.

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Virtual reality interface for Assist in Programming of tasks of a robotic manipulator

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Abstract. The creation of interfaces that contribute to the interaction between a programmer and an industrial robot are based on implementing adequate procedures that facilitate people without knowledge of robotics and programming of robotic manipulators to generate tasks or activities that the robotic arm executes. In this article, it describes the creation of a programming interface using virtual reality, as an immersion tool in the work environment of the yaskawa motoman HP20D robot. This virtual environment was developed from 3D models, later exported to the Unity 3D video game engine, in this interface the functions are programmed that allow the user to interact with the robot according to the movements and trajectories performed by the user in the work environment. A MYO Armband sensor is used to operate the position and orientation of the end effector of the robot within the environment and the Oculus Rift DK2 virtual reality glasses are used to visualize the entire space, with a first-person perspective. As a result, a computational tool is obtained that allows generating trajectories, recording them, simulating them and generating the script or programming code to be implement in the robotic manipulator controller.

Keywords: Robotics, Human-Robot Interaction, virtual reality, programming.

1 Introduction

The technology evolves with the purpose of facilitating human activity, as well as the fact of providing independence of previous knowledge in the actions developed in a computer, when referencing in the academy there are advances like the one that describes an embedded system, signal reader electromyography and inertial measurements for the control of visible tasks in a computer, as is the movement of the cursor, its main objective to help people with disabilities [1]. Related to this project that involves the same nature of signals, unlike that will be applied in control tasks, such as the movement of the final effector of a robotic manipulator located in a virtual environment.

The peripherals that are used conventionally in the construction of a human computer interface are mouse and keyboard, there is the need to alternating this technology by one that allows to give versatility to the user in the environment, tools that are suited to