



Simulator for Learning Robotics Topics in Xbox Consoles

Alfonso Ortiz-Moreno, *jortizm0403@alumno.ipn.mx*

Mechatronic Academy, UPIITA-IPN, Instituto Politécnico Nacional, México.

Angel Pretelín-Ricárdez, *apretelin@ipn.mx*

Mechatronic Academy, UPIITA-IPN, Instituto Politécnico Nacional, México.

Alberto Luviano-Juárez, *aluvianoj@ipn.mx*

Mechatronic Academy, UPIITA-IPN, Instituto Politécnico Nacional, México.

Abstract

Nowadays, simulation is used as an educational approach to new technologies, letting the learners modify aspects to observe the system's reactions and, as a result, learn through experimentation. The objective of the project presented in this paper is to design and develop a robot simulator using Microsoft specialized software for learning robotics topics and make it easy to download and to operate on Xbox Live platform.

The user will have the option to choose different links of a robotic manipulator from a menu and will be able to join them either through prismatic or revolute joints. Though this activity, the user will be able to construct as many different manipulator configurations, as he can imagine.

Once the user chooses and join the robotic manipulator base and all the links that compose it, he will press a button that allows the system to start explaining the basic methodology for the direct dynamics analysis of robotic manipulators. After that, the system will show the user how his model would move in real life.

Constructionism assures that it is easier to learn science when the learner is committed to the construction of a project. Through this simulator, the user will construct a model that is significant to him and, at the time he constructs a robotic manipulator and sees how it would work in real life, he constructs knowledge as well.

The Xbox console and the Xbox LIVE platform have been chosen for developing this project due to the accessibility of them. Nowadays over twenty million people around more than thirty five countries in the world have access to an Xbox LIVE account. Someone can access to Xbox LIVE even if they do not have an Xbox console. They can do it through a PC, a cell phone with Window operating system, a cell phone with Android operating system and also some devices from Apple company such as iPod, iPhone or iPad. That way, a lot of people all around the world could have access to the simulator.

In this stage of the project developing, the design and programming of the simulator will focus only for usage in Xbox consoles. Nevertheless, it is expected to extend its usage to other electronic devices. Some simulators of robotic manipulator are difficult to be acquired or accessed, first due to their complexity and the basic previous knowledge on issues like software usage or also, robotics. This project pretends to be an accessible learning source for those who want to start acquiring knowledge on robotics field.

Keywords

Constructionism; robot simulator; robotics; Xbox; games console; educational technologies, robotic maipulator.