

ABSTRACT

These last years the sector of autonomous robotic systems has been met with an exponential expansion. As a result these autonomous robots and these robotic media have flooded the markets around the world. Today mankind has been more dependent on technology than ever before, either for the completion of different work related tasks or for purposes of comfort or for purposes of needs as for example robots that can perform various types of tasks in environments that humans, cannot work.

This dissertation has as a goal the creation of a model of a 3D environment that can be used for the guidance of a robotic machine. The environment data are being gathered by a sensor from Microsoft's Kinect device and after processing them the program detects and the existence of object in the room as well as distance and shape.

The development of this environment is being achieved with the use of a personal computer and Linux OS. Kinect feeds the data into the computer with the help of the sub-operating system ROS (Robot Operating System) and of the sub-program Rviz. Afterwards using PCL (Point Cloud Library) and the high-level programming language C++ the data is being processed and they are being sorted into groups of similar points. Finally with the use of a mathematical model and C++ we can learn the coordinates of the said object as its shape and equation.

With the successful design and implementation of this system we will be able to gather information about a whole environment that the Kinect sensor "sees". Also we will be able to process the raw data and according with the mathematical model the environment will be recreated and fed into the robotic machine as help for its guidance.