

Supported by a 110,000 JD grant from the Deanship of Scientific Research at the Hashemite University, Zarqa, Jordan, the CPE department through its professors --- Dr. Khalil Yousef (principle investigator) and Dr. Bassam Mohd --- has recently established an advanced robot vision research lab composed of state-of- the-art mobile and humanoid robots equipped with many sensors (such as PTZ cameras, stereo cameras, RGB-D sensors, Laser range finders, 7-DOF manipulator arm, etc.). It is noteworthy to mention that this lab with its equipment's is unique in all of the local Jordanian Universities, and will be used toward several functions and applications to serve and benefit the university and the country.

Some of the main objectives of the established robot vision research lab are as follows:

1. Using an indoor mobile robot platform for creating 2D/3D dimensional dense and accurate maps of the interior environments. Such maps will then be used later-on for the navigation by the robot and to facilitate its place recognition and autonomous navigation in the indoor facilities.
2. Developing a computer vision system for knowing the right position of a moving object inside a given indoor environments at any time with the help of the constructed maps.
3. Designing a novel FPGA-based architecture for the extraction of map features that will be used in localization process of the moving objects.
4. Explore topics concerning mobile robotics and their application to say agriculture (harvesting, pruning, etc.) or military or to healthcare or may be other application domains.

Below are some pictures of the research lab equipment's.



Figure 1 PeopleBot indoor robotic research platform equipped with SICK LMS-500 2D laser range finder, AXIS 214 PTZ network camera and a mobileRanger FPGA-accelerated C3D stereo camera.



Figure 2 SICK LMS-100 2D LRF sensor and a Kinect Xbox 360 camera rigidly attached to each other to simulate an indoor mobile robot

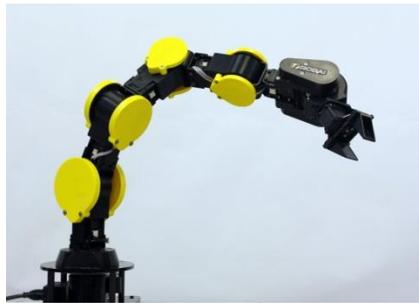


Figure 3 A Revolutionary 7-DOF robot Manipulator: CYTON EPSILON 1500



Figure 4: Turtlebot 2 mobile robot platform equipped with Kinect Xbox 360 RGB-D sensor

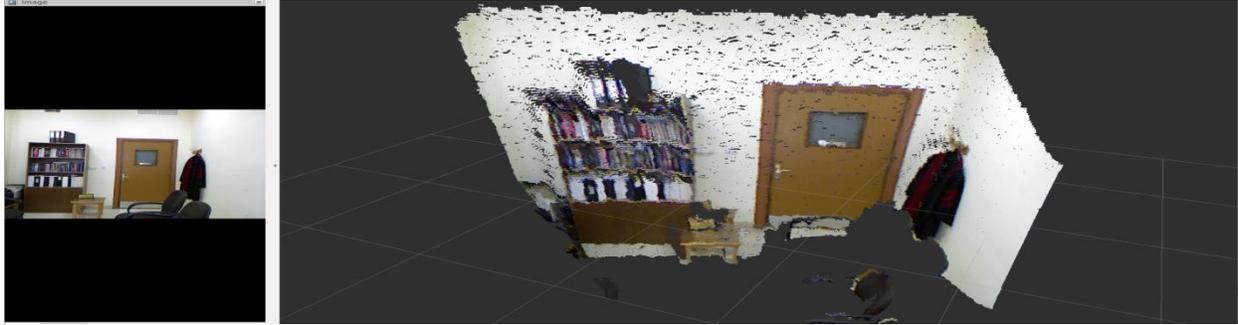


Figure 5: An example of RGB-D SLAM model of the office E3039 at the Hashemite University constructed using the Turtlebot 2 mobile robot platform

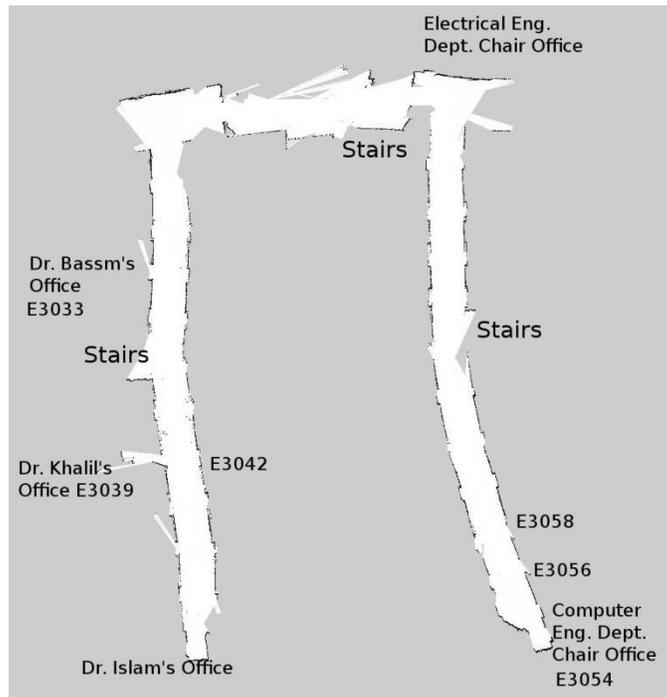


Figure 6: A 2D occupancy grid map segment of the third floor of the biomedical engineering hallways and the electrical engineering / Computer Engineering hallways at the Hashemite University constructed using the Turtlebot 2 mobile robot platform.

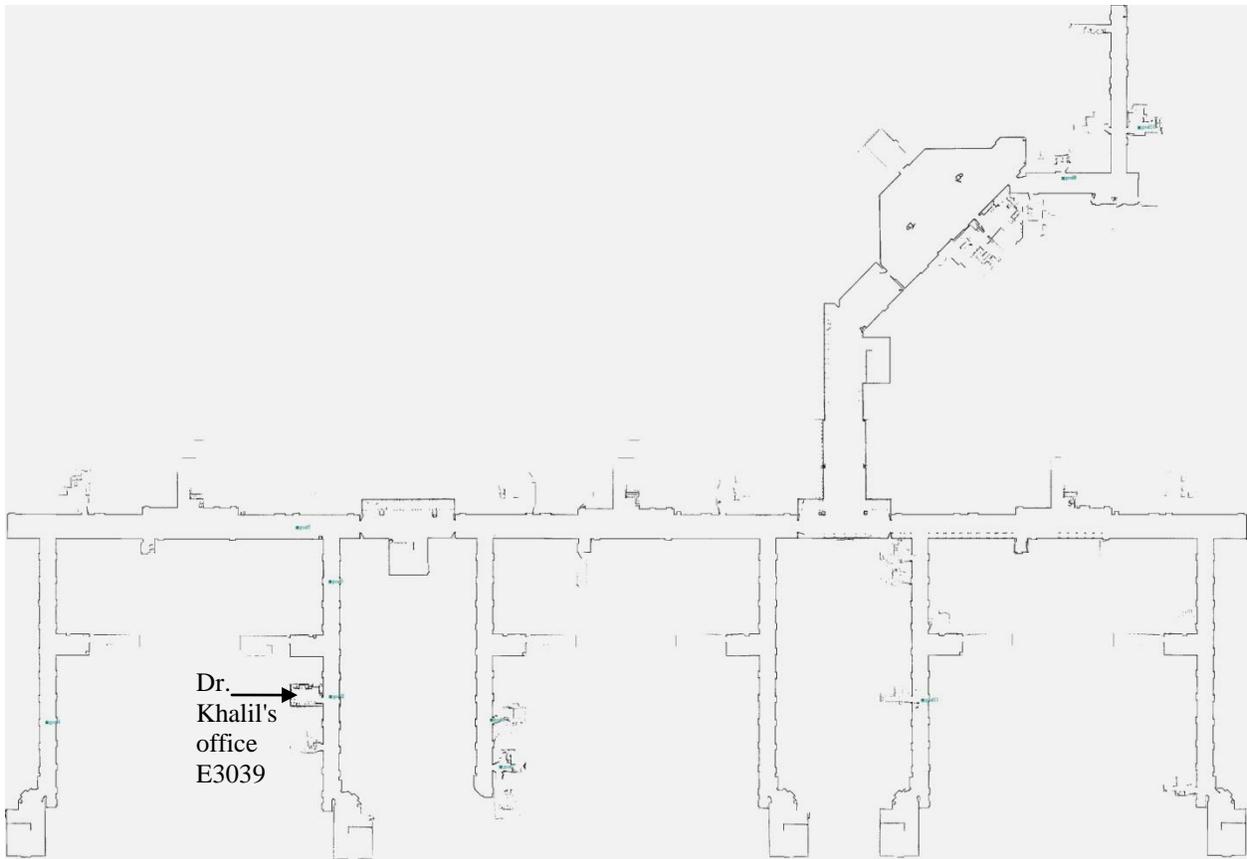


Figure 7 A very accurate 2D occupancy grid map of the entire third floor of the interior hallways of the engineering building at the Hashemite University constructed using the PeopleBot research mobile robot platform shown in Figure 1.