

Intelligent Guide Robot (I-GUIDE)

Joe Buckner, Nir Chezrony, Joel Schipper, James Irwin, Jr.
Bradley University
Peoria, Illinois

Abstract

The objective of this project is to design an autonomous robot that acts as a tour guide for visitors of the Electrical and Computer Engineering (ECE) Department at Bradley University. This project utilizes a Pioneer 3 Robot as a working platform for the Intelligent Guide Robot (I-GUIDE). Microsoft Visual Studio and ARIA MobileSim software packages are used to program and simulate the Pioneer 3 in C++. I-GUIDE employs a basic wall-following and path planning algorithm with obstacle avoidance and unique landmark detection. The wall-following and obstacle avoidance algorithms utilize arrays of infrared and sonar sensors. Unique landmark detection is provided by ultra-violet sensitive barcodes placed on the ceiling, which are read by an extended range barcode scanner. Path planning is accomplished using an internal topological decomposition map, where each node corresponds to a unique landmark. A user interface consisting of a keypad, “kiosk” liquid crystal display monitor, and computer speakers is used to interact with ECE Department visitors.