
Online Automation and Control: An Experiment in Distance Engineering Education

**INTERDISCIPLINARY ROBOTICS AND INTELLIGENT
SYSTEMS CONTROL (RISC) LABORATORY**

UNIVERSITY OF BRIDGEPORT

Introduction

- Online Distance Education is a major part of the current education system
 - Started as an internal exercise to share and discuss ideas
 - Ever growing need for part-time education
 - 213 Universities offering online courses at various levels and disciplines in the US
 - Majority of the online courses are non-technical
 - Lacking laboratory based courses
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Need for Online Education

- Part time course work
 - Working class willing to pursue higher education
 - Social responsibilities
 - Current socio-political situation
 - National and International demand
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Distance Engineering Education

- Accredited engineering degrees
 - Under-graduate and Graduate level
 - Computer Engg, Electrical Engg, Mechanical Engg
 - Comprehensive laboratory based courses.
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Partnerships

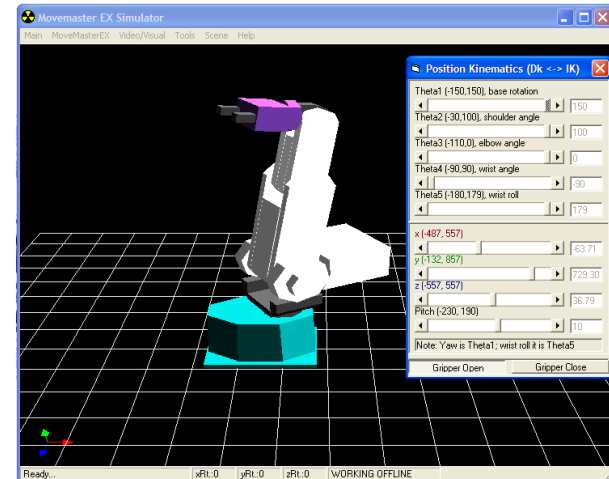
- Great value of American engg. degrees overseas
 - Partnership with foreign University/Institution providing
 - Infrastructure
 - Teaching support
 - Examination facilities
 - Closer to the student concentration
 - Helps in better delivery of courses
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Online Distance Laboratories

- Using Automation and Telerobotic (controlling devices from a distance) systems
 - Real-time laboratory experience via the internet
 1. Tele operation of Mitsubishi Movemaster
 2. RISCBOT – A Web Enabled Autonomous Navigational Robot
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1. Tele-operation of Movemaster

- Can be used in 3 modes
 - Evaluation mode
 - Teacher mode
 - Student mode

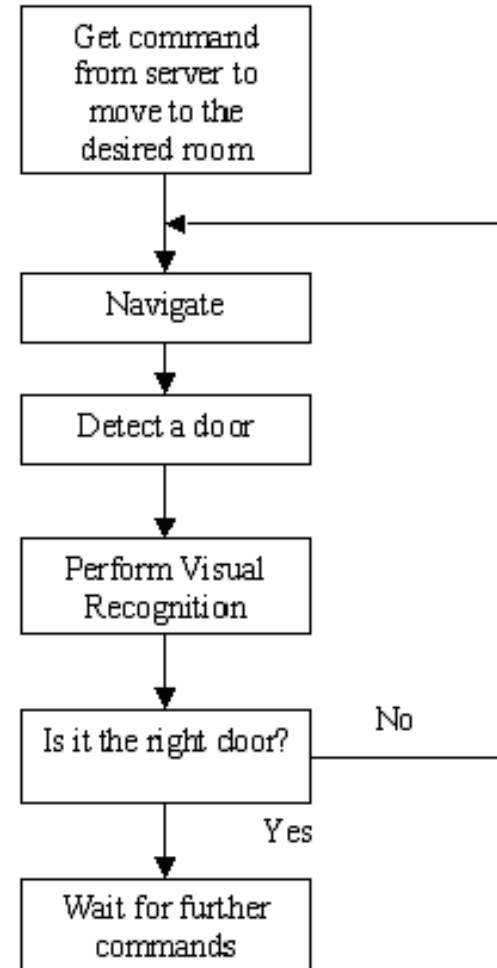


2. RISCBOT

- Modular 802.11b – enabled mobile autonomous robot
 - Navigation based on a visual recognition algorithm
 - Controlled via the internet to navigate to desired destination
 - Online users receive real time video feedback from the robot
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RISCBOT

- Waits for command from the server.
- Wall clinging robot.
- Image processing program checks for doors.
- Uses Ultrasonic sensors for obstacle avoidance.
- PC acts as central decision maker.



RISCBOT IN ACTION



RISCBOT CONTROL WEBSITE

The screenshot shows a web browser window titled "Demo 2 - Microsoft Internet Explorer" with the address bar displaying "UE FISC LAB Wed Jun 30 12:32:25 AM 2004". The main content area is divided into several sections:

- Robot Control Window:** A large video feed showing a perspective view of a hallway with a robot in the distance. Below the video is a "MOVE" button.
- Navigate To:** A vertical list of radio buttons labeled "Room 1" through "Room 11". "Room 1" is selected.
- Top View:** A smaller video feed showing a top-down perspective of the hallway.
- Cam View:** A video feed showing a different camera angle of the hallway.

At the bottom of the browser window, there is a text area containing the sentence: "With 802.11 b connections becoming ubiquitous, we are bound to see many more similar robotic applications in the future." Below this text are two buttons labeled "DEMO 1" and "DEMO 2". The browser's status bar at the bottom shows "Done" and "My Computer".

FUTURE WORK

- Providing telerobotic operability of the FESTO process control machine by interfacing it with the Mitsubishi Movemaster robot.



THANK YOU
