PhD Proposal MAP-I

WIIMOVE –
Gesture Based Interaction with Robotic Teams

Supervisors and Research Units

Armando Jorge Sousa – asousa@fe.up.pt – http://www.fe.up.pt/asousa
(ISR-P – Instituto de Sistemas e Robótica Porto)

Luís Paulo Reis – lpreis@fe.up.pt – http://www.fe.up.pt/~lpreis
(LIACC – Lab. Inteligência Artificial e Ciência de Computadores da Universidade do Porto)

Abstract

Human Machine Interfaces (HMIs) for robotic systems have been subject of considerable research. Interfaces are crucial to have truly autonomous robotics, that is, to have the robotic system perform as a helper to the human. These ideas are common to all robotic systems but are particularly relevant in the field of Robotics.

Different applications drive distinct requirements that include ordering systems to perform on any specified way. Possible orders include behaviours relating to the environment or to humans, or coordination with other systems, etc. Commands can be issued either near the robot or near supervision station and can drive several degrees of complexity (abstraction).

Recent developments in robotics push several COTS devices into interesting new possibilities. Among these devices, the Nintendo Wii remote command ("wiimote") features an interface that can easily be extended for robotic HMI's. The wiimote has 3 accelerometers and an infra-red camera that communicates by Blue Tooth allows the interpretation of the human's intentions by adequately reading gestures. The wiimote will, in near future, feature gyroscopes for additional capabilities.

Previous work exists that ensure it is easy to connect to wiimote devices.

Objectives

The main objective of this work is to develop innovative interfaces for ease of operation when interacting with autonomous robotic systems. The system will read data from the wiimote and assess the human's intentions and communicate them to proper handling systems in order to command a particular behaviour.

Specific objectives include:

- List requirements for HMIs;
- List capabilities of the wiimote, comparing to conventional HMIs;
- Retrieve and analyse data from wiimotes (gestures, IRs, etc), assess the need for training;
- Feedback the results.

Additional Information

Complete description available upon request.

More Information at: http://www.fe.up.pt/asousa