Cognitive Robotics

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ABSTRACT

One of the main goals of the Human Research and Engineering Directorate's Cognitive Sciences Branch has been to find ways to reduce the cognitive workload on soldiers. One area in which the branch has been studying is the use of robotics for room clearance. Soldiers risk their lives every day while searching buildings and multiple operators are needed to control robots with limited effect. The purpose of this project was to develop an algorithm or modify the exiting AdaBoost algorithm that could be coupled with a robot that is capable of exploring a building. The algorithm would allow the robot to recognize obstacles in its path, such as doorways or objects like chairs. Other algorithms on board allow the robot to conduct path planning. The robot can avoid obstacles and choose paths of least resistance by sacrificing time for security. Having the robot act independently will help reduce cognitive workload on soldiers and will lessen the need for soldiers to be put in harm's way.

Keywords: Adaboost, boosting, weak classifiers, strong classifiers, overfitting, scan

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