Summary

Abstract

The ~~main~~ objective of this master thesis is to introduce a new kind of protection. This protection is based on swarm robotics. A swarm of robots protects a human by augmenting his/her abilities in the sense that the robots provide feedback on the invisible nature of the environment. In contrast with the current literature that mostly explores solutions with a one-way feedback from the human operator to the robots, our solution provides a bidirectional feedback. The human indirectly controls the robots by changing his/her position. The swarm of robots, encircling the human, notifies the human about near invisible dangerous areas. The robots stay at the boundary of the dangerous area to form a kind of barrier. ~~The software controlling the robots was implemented through a process of trial and error~~. It was tested heavily in simulation with ~~ARGoS, a simulator used to run experiments involving large amount of robots~~, and on the real robots. A pair of augmented shoes was built and equipped with LEDs. They allow the robots to locate the human. The experiments conducted yielded good results and can act as proof of concept. ~~However one will need to overcome some limitations to enable real life applications.~~

Keywords: swarm robotics, human escorting, dangerous areas, augmented shoes