DEVOLEPING AN EFFECTIVE CONTROL AND SEARCH STRATEGY FOR SWARM ROBOT

A PROJECT REPORT

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In partial fulfillment of the requirements for the degree of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION

(Visvesvaraya Technological University, Belgaum)

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2010 – 2011

ABSTRACT

Swarm robotics is a new approach to the co-ordination of large numbers of relatively simple robots. The approach takes its inspiration from the system-level functioning of social insects which demonstrate three desired characteristics for multi-robot systems: robustness, flexibility and scalability. Social insects are highly robust. Their self-organized systems can still work even after losing lots of system components or changing the environment parameters considerably. As the problem change, the system has to be flexible enough to switch to a suitable behaviour to solve the new problem. The biological systems have this level of flexibility and can easily switch their behaviours when problems change. For instance, ants are so flexible that they can solve foraging, prey retrieval and chain formation problems with the same base self-organized mechanism.

This project presents modular swam robots, that describes the development of the concept of swarm intelligence. Here a robotic system for mine detection and other search operation is presented. It composed of four individual robots that interact and co-operate to reach their goals. It uses a decentralized strategy, which is analogous to distributed search algorithms that are able to cover different parts of a search space at once. In this work, infrared sensor system is used to implement a reliable local communication , using which the robots execute the decentralized search operation, by avoiding objects .Whenever a single unit find the object, it will signal the other units together around the target so that it finishes its operation.