

# Augmented Reality Debugging System for Swarm Robotics

## Initial Report

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January 2017

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## 1 Project Overview and Aims

Swarm Robotics is the name given to the nascent field of study focusing on the use of concepts derived from the study of social insect ‘swarms’, such as ants or bees, to design and implement robot behaviours which allow a group of simple actors to achieve a complex, cooperative behaviour. The broader area of study, without the robotics focus, is referred to as Swarm Intelligence (SI), and is described by Dorigo & Birattari as the “*discipline that deals with natural and artificial systems composed of many individuals that coordinate using decentralized control and self-organization*”, with examples including insect colonies, fish schools, and flocks of birds<sup>[1]</sup>. Whilst the details of this complex area of study are outside the scope of this report, it is of importance to the nature of the project to note that one of the key aims of swarm robotics is decentralised control. To this end, in a swarm robotics system you would not expect to find any master controller or central unit. Instead each robot will likely be acting purely based on information available locally, and there will be no point in the system that is aware of the current state of all the robots. Coupling this with the more general problem in debugging robotics that the state of a robot may change rapidly over time, and be dependent on a large number of environmental or outside factors, it becomes readily apparent that debugging a swarm robotics system effectively may present an enormous challenge. This project, entitled “Augmented Reality Debugging System for Swarm Robotics”, focuses on the creation of a computer application and associated protocols

## 2 Specification

## 3 Literature Survey

## 4 Project Plan

## References

- [1] Swarm intelligence. Dorigo M. Birattari M.